



Magic-Based Intervention in a Parkinson's Disease Boot Camp: A Qualitative Program Evaluation

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Abstract

Parkinson's disease produces a combination of motor, speech, cognitive, and psychosocial impairments that rarely respond to any single intervention. Activity-based programs that are enjoyable, repetitive, and socially embedded have therefore attracted growing interest. This qualitative program evaluation reports provider observations from a Parkinson's Disease Boot Camp, a two-week community program for adults living with Parkinson's disease, in which Doctor of Physical Therapy students integrated structured instruction and the performance of simple magic effects into an established treatment program. Thirteen participants took part. Researchers drew observational data from student and faculty session records. Researchers identified five themes: emotional empowerment and joy, engagement and motivation, social connection, observed functional change, and resilience. Faculty and students reported improved hand control, standing balance, voice projection, and task sequencing during magic activities, and reduced bradykinesia in some participants during mirrored movement. Participants frequently expressed an intent to teach the effects to family members. No standardized outcome measures were administered, so these observations are hypothesis-generating rather than evidence of efficacy. The report provides a theoretical rationale, describes the delivery model, and outlines a measurement agenda for formal evaluation.

Keywords: Parkinson's Disease; Magic Therapy; Arts in Health; Motor Learning; Occupational Therapy; Physical Therapy; Self-Efficacy

Introduction

Parkinson's disease is among the fastest-growing neurological conditions worldwide, and the global burden attributable to it more than doubled between 1990 and 2016 [1]. One of its cardinal motor features, bradykinesia, is characterized by slowness of movement and a progressive

decline in amplitude and speed during repetitive actions [2]. The consequences for the upper limb are substantial. Impaired dexterity and difficulty coordinating skilled hand movements predict restrictions in activities of daily living, independently of overall disease severity [3]. Speech is affected in most patients, most commonly by reduced loudness and monotone pitch [4], and postural instability,

freezing of gait, and falls become increasingly prominent as the condition progresses [5]. Alongside these motor features, apathy affects a substantial proportion of people with Parkinson's disease and is associated with reduced participation, caregiver burden, and diminished quality of life [6]. Thisidence and self-efficacy are functional variables in this population, and balance self-efficacy predicts walking capacity beyond measured balance performance [7].

Rehabilitation has responded to this profile with intensive, repetitive, amplitude-focused interventions. Aerobic and skill-based exercise appears to influence neuroplastic mechanisms relevant to both motor and cognitive circuitry [8]. A multicenter randomized controlled trial demonstrated that home-based occupational therapy improves self-perceived performance in daily activities [9]. Amplitude-oriented training protocols have shown benefit for movement [10] and for voice [11]. Community-based dance improves motor function and maintains high adherence [12]; rhythmic auditory stimulation improves gait parameters [13]; and non-contact boxing training has been described as feasible and beneficial in a case series [14]. Group delivery adds another dimension, and a recent meta-analysis found that group exercise is associated with improved quality of life in Parkinson's disease [15]. Interest has also turned to creative engagement, with person-centered arts interventions co-designed with people living with the condition [16]. These approaches differ widely in movement prescription but converge on a common structure: high-repetition practice of demanding tasks, embedded in an activity people enjoy and are motivated to engage in.

Magic-based intervention is a small but theoretically distinct arts modality with a consistent structure. Harte and Spencer argued that the precision and repeatability of magic effects make them well suited to motor learning protocols [17]. Two systematic reviews have since mapped the field, reporting benefits for well-being while noting the evidence is small and largely uncontrolled [18,19]. The strongest motor evidence comes from magic-themed hand-arm bimanual intensive therapy for children with unilateral cerebral palsy, in which multisite pre-post studies with follow-up have shown functional gains [20,21]. A meta-analysis has confirmed benefits for daily bimanual task performance [22]. Qualitative work identified social opportunity as one of the most frequently reported mechanisms of change in these programs [23]. In parallel, magic camps for children with hemiparesis [24,25], magic trick training for adolescents with autism spectrum disorder [26], virtual magic camp for children with attention deficit hyperactivity disorder [27], and bedside magic for pediatric inpatients [28] have reported gains in social skills, self-esteem, and anxiety. Almost all of this work involves children. The only published trial in an adult population examined a magic intervention program in

older adults with mild cognitive impairment and reported improved cognitive and neurocognitive performance [29].

No published study has examined magic-based interventions for Parkinson's disease. The rationale for doing so is nonetheless straightforward. Learning and performing a magic effect demand graded force, in-hand manipulation, bilateral coordination, sequencing, and sustained attention, culminating in a performance that requires audible, projected speech to an audience. It supplies, in other words, several of the impairment targets of Parkinson's rehabilitation within a single motivating occupation. This report describes integrating a magic-based activity into an established Parkinson's Disease Boot Camp, presents observations from the students and faculty who delivered it, and outlines the measurement agenda required for formal evaluation.

Materials and Methods

Design

This qualitative program evaluation presents observational data collected during routine programming. We applied no experimental manipulation and administered no standardized outcome measures. The Parkinson's Disease Boot Camp (PDBC) is a clinical education activity offered by Chapman University's DPT program. IRB approval was not required.

Setting

The program is a Parkinson's Disease Boot Camp held twice weekly for two weeks, with three hours per day, for a total of four three-hour sessions. It is held twice yearly, in the Spring and Fall trimesters, at Chapman University's Rinker Campus in Irvine, California, and staffed by third-year Doctor of Physical Therapy students under clinical faculty supervision. The camp delivers targeted physical and cognitive exercises in individual and group formats. In the cohort reported here, students integrated structured teaching and the performance of simple magic effects into the existing treatment program.

Participants

Thirteen adults living with Parkinson's disease attended the camp in the fall of 2025. Participants ranged in age from 64 to 86 years (2 women and 11 men), with self-reported disease duration of 3 to 18 years and Hoehn and Yahr stages of 1.5 to 3. Participation in the camp was voluntary and self-selected through announcements at local community Parkinson's disease exercise programs and word of mouth (from friends, family, physical therapists, and neurologists). Participants were included if they had access

to transportation, were available on at least three of the four days, could follow commands, could mobilize independently or with assistance from only one person, and had no medical or orthopedic conditions that would prohibit exercise or upright activity.

Intervention

Magic effects were selected and graded within the Magic Therapy framework, a structured approach that applies the deliberate construction and performance of magic effects to defined therapeutic goals [30]. As delivered here by Doctor of Physical Therapy students, the framework was operationalized through motor learning theory. Each effect was treated as a discrete motor skill to be acquired, with acquisition understood to proceed through the cognitive, associative, and autonomous stages described by Fitts and Posner [31], and with the objective being an adaptable motor program rather than a memorized movement sequence [32]. Effects were graded so task difficulty remained near the point where practice yields the greatest learning, following the challenge point framework, in which optimal difficulty is a function of the performer's current skill [33]. This rationale supports the approximately 80% success rate targeted during practice. Feedback was scheduled with the same intent: immediate correction of procedural errors was paired with a deliberate reduction in feedback frequency as the skill consolidated, a schedule that depresses performance during practice while improving retention [34]. The concealment requirement of a magic effect adds another feature of interest in this population. Attention must be directed to the prop, the audience, and the method rather than to the performer's own limb, which the task structure imposes as an external focus of attention. External focus instructions have been shown to reduce postural instability in Parkinson's disease [35].

Two additional frameworks informed delivery. Incentive theory of motivation holds that a stimulus acquires motivational salience and elicits approach and effort when it is associated with reward, a process implicated in dopaminergic signaling [36]. The internal structure of a magic effect, in which tension is created and then reliably resolved at the reveal, was used to locate the incentive within the practice itself rather than in an external reinforcer, a consideration of relevance when dopaminergic function is compromised. Social learning theory contributed to the second element [37]. Students modeled each effect before the participant attempted it, providing both observational learning and a performance standard. Successful completion in front of the group provided the mastery and vicarious experience from which self-efficacy is built [38]. The framework's original articulation drew on occupation-based practice [39], and this account restates it in motor-learning terms appropriate to a physical therapy context.

Each effect has a primary therapeutic demand and a set of secondary demands, and we grade it by adjusting prop resistance, sequence length, cueing, and postural context. Table 1 lists the effects taught at this camp and the demands each address. Participants engaged in one to three sessions of magic-effect training during the Boot Camp. Training occurred during individual treatment sessions, at the discretion of the students working with individual participants with PD. Each magic-effect training session lasted approximately 60 minutes and took place within the individual treatment portion of the camp day. Instructions in each effect were therefore delivered one-to-one, while performance opportunities took place within the group portion of the camp.

Student providers were prepared in advance of the camp. They received a 90-minute training session as part of their trimester eight Advanced Neurologic Practice Elective course. This training occurred 2.5 weeks before PDBC. Students' competency in performing the effects was assessed observationally during lab activities, and their understanding of the benefits and parameters of therapeutic application was assessed cognitively via questions on a written exam. An instrument for evaluating practitioner competency in delivering magic tricks has been published and validated with health professions students [40].

Sessions followed an eight-step structure: assessment, task analysis, graduated practice at approximately an 80% success rate, real-time feedback for procedural errors and slightly delayed feedback for cognitive processing, process-oriented reinforcement, a performance opportunity, attention to emotional regulation during performance, and integration into the daily routine. The performance step is central. Rehearsal builds motor skills, and performing for another person embeds those skills in a socially meaningful task.

Data collection and analysis

Doctor of Physical Therapy students who delivered the sessions and supervised clinical faculty recorded observations. Students were assigned to instruct their PDBC participant in at least one magic effect, write a reflection on their clinical reasoning for choosing the effect (s) taught, and complete a post-PDBC Qualtrics survey about the experience and participant response. Records were reviewed and grouped into descriptive themes by the second author (PB), and the final themes were agreed upon by consensus between the two authors. Because the observers were also the providers, the observations are not independent and are reported here as clinical impressions rather than measured outcomes (Table 1).

Effect	Primary Demand	Secondary Demands	Adult Grading Options
The Challenge Knot	Gross motor coordination and bilateral integration, midline crossing, shoulder abduction against resistance	Motor planning, visual scanning, balance and weight shifting, executive sequencing	Grade cord thickness and length; teach in faded sub-steps; add elastic band resistance
The Instant Knot	Bilateral coordination, shoulder stabilization, weight shift	Sequencing, processing speed, pragmatic language, resilience	Substitute elastic tubing to alter resistance; teach two-handed then progress to one-handed; deliver seated on a therapy ball for trunk and postural demand
The Floating Pencil	Bilateral coordination, midline crossing	Finger isolation, flexion and extension, visual-motor integration, trunk rotation	Entry level; supports the bimanual control used in handwriting and keyboarding; can be used to shift hand dominance
Linking Paper Clips	Fine motor dexterity and pincer grasp	Bilateral hand use, spatial reasoning, sequencing	High-success confidence builder; pre-fold or pre-mark the strip; use tear-resistant paper to reduce frustration
Jumping Rubber Band (four graded versions)	Finger flexion and extension, pincer grasp, forearm supination and pronation	Complex sequencing, sustained attention, form discrimination, problem solving	Alter band size and thickness for resistance; place band above the first finger joint where flexion is limited; use a wand to assist finger opening; color-code for sequencing

Table 1: Magic Effects and Their Primary and Secondary Therapeutic Demands.

Results

Five themes were identified across the observational records. Table 2 summarizes them.

Theme	Representative Observations	Candidate outcome domain for future measurement
Emotional empowerment and joy	Pride on completion; laughter and visible enjoyment; expression not seen in other sessions	Mood, affect, apathy
Engagement and motivation	High eagerness and curiosity; self-initiated practice between sessions	Adherence, intrinsic motivation, practice volume
Social connection	Stated intent to teach family members; collaborative problem solving	Social participation, caregiver dyad interaction
Observed functional change	Hand control, standing balance, voice projection, sequencing, range of motion, reduced bradykinesia during mirroring	Dexterity, balance, vocal intensity, executive function, motor speed
Resilience and adaptability	Persistence after initial difficulty; tolerance of error; celebration of small gains	Self-efficacy, coping, perceived competence

Table 2: Themes identified from provider observations.

Emotional Empowerment and Joy

Participants were often described as confident, empowered, and proud after successfully completing an effect. Laughter, smiles, and visible enjoyment were common.

Students noted that several participants displayed emotional expression during the magic sessions that they had not shown in other sessions that week, including those who had arrived disengaged or were having a difficult day.

Engagement and Motivation

Engagement, eagerness, and curiosity were reported to be high across the group. Several participants were observed practicing between sessions and seeking opportunities to improve, which the supervising faculty interpreted as evidence of personal initiative rather than compliance with instructions. For some participants, the effect posed a shared challenge, and students recorded instances of teamwork and collaborative problem-solving among those working on the same effect.

Social Connection

A recurring observation was that participants were eager to teach the effects to grandchildren, spouses, and other family members. This orientation toward a future audience appeared to add a social dimension to the activity that extended beyond the session, giving the rehearsal an explicit purpose outside the camp.

Observed Functional Change

Students and faculty described changes in several areas of performance during magic activities. These included hand control and fine motor skills, standing balance and gait during standing effects, voice projection during effect presentations, and task sequencing, working memory, and range of motion. Mirroring and movement during magic activities were associated with reduced bradykinesia in some participants, as observed by students. These are unmeasured clinical impressions recorded by providers and should be read as observations warranting testing rather than as demonstrated effects.

Resilience and Adaptability

Participants who initially struggled were nonetheless described as finding value in the experience. The activity's structure, which requires repetition before a first successful performance, appeared to foster tolerance for error and the celebration of incremental progress. One effect in the repertoire, the Instant Knot, is deliberately built around an unsuccessful first attempt, giving the performer a structured opportunity to recover, reframe, and try again.

Discussion

The observations reported here suggest that magic-based activity was feasible and well received within the Parkinson's Disease Boot Camp, and that it was associated with engagement that the delivering students found notable. Feasibility and engagement are modest claims, and they are appropriate for observational data of this kind. They

also carry practical weight. Adherence and sustained practice intensity are the limiting factors in most activity-based Parkinson's interventions, and understanding which activities participants practice between sessions without prompting is worth exploring.

Several mechanisms plausibly contribute. The first concerns attentional focus. Performing a magic effect requires the performer to attend to the prop, the audience, and concealing the method rather than the mechanics of their own movement, thereby imposing an external focus of attention. External focus instructions have been shown to reduce postural instability in Parkinson's disease [35], and the magic effect embeds that instruction in the task rather than delivering it as a verbal cue. The second concerns motor learning. Skill acquisition proceeds through cognitive, associative, and autonomous stages [31], and adaptable motor programs, rather than memorized sequences, underpin performance that endures changing conditions [32]. A magic effect enforces this progression because a performance in front of an audience will not tolerate hesitation or visible effort. The repetition it demands is therefore governed by a standard the performer has adopted, which sustains practice quality in a way that counted sets rarely do.

The third concerns self-efficacy. Mastery experience is the most potent source of efficacy information [38], and a magic effect delivers mastery in a form that is witnessed, unambiguous, and immediately legible to an audience. For a population in which confidence itself predicts functional walking capacity [7] and apathy and withdrawal are common [6], an activity that reliably produces witnessed competence has a defensible rationale. The move from patient to performer is the mechanism of interest here, and the observed intention to teach family members suggests that participants were already anticipating that role.

The fourth concerns the structure of the magic effect itself. A magic effect is organized around expectation, violation, and resolution, and the emotion it produces has been theorized as wonder, an epistemic state situated between awe and curiosity that arises when a schema violation cannot be immediately resolved [41]. Two properties of that arc matter clinically. The effect retains its interest with repeated exposure, which suits an intervention that depends on repetition, and the resolution is guaranteed, keeping the tension tolerable rather than aversive. Wonder remains a candidate mechanism. No study of a magic-based intervention has measured wonder, awe, or curiosity as a process variable, and no mediation analysis has been conducted.

Situating this work within arts and health is useful. The World Health Organization scoping review established that

arts engagement contributes to both the prevention and the promotion of well-being across the lifespan [42], and Parkinson's rehabilitation already draws on dance [12] and rhythmic music [13] as delivery vehicles for movement. A magic-based intervention belongs in that company, with the distinguishing feature that its unit of practice is a discrete, repeatable, precisely specified manual task that culminates in a social performance. That combination maps directly onto the upper-limb and speech profile of Parkinson's disease in a way that dance and music do not.

Limitations

This report has substantial limitations that constrain what can be concluded. No standardized outcome measures were administered, so every statement about change rests on unmeasured clinical impression. The observers were the providers, introducing expectation bias, and no independent or blinded rating was obtained. The study included no comparison condition and no control for the general effects of a novel, attention-rich activity delivered one-to-one by enthusiastic students. Participants were self-selected camp attendees, and the sample is small. The authors did not collect participant-reported outcomes, so the emotional and social themes reflect what providers observed rather than what participants reported about their own experience. No follow-up was conducted, and there is no basis for any claim about durability. Magic-effect dose varied across participants, from one to three sessions assigned at student discretion rather than by protocol, so it was not standardized. Optimal dosing remains an unresolved question for magic-based intervention generally. Finally, the observations describe engagement, mood, connection, and performance during a therapeutic activity. They do not speak to the underlying disease process, and no claim of disease modification is made or implied.

Directions for Evaluation

A feasibility study is the appropriate next step. A defensible design would retain the camp structure while adding pre- and post-measures across the domains implicated by the observations. Candidate measures include the Movement Disorder Society Unified Parkinson's Disease Rating Scale motor section for bradykinesia and upper-limb function; a timed dexterity measure for the hands; a validated balance measure to assess standing effects; sound pressure level during a standard speech task to assess voice projection; the Canadian Occupational Performance Measure for client-identified goals; and a disease-specific quality-of-life measure. Provider-independent rating, a documented dose, and a three-month follow-up would address the most serious limitations noted above. Adapting a learner-progress instrument such as the Hocus Focus Analytics scale [43]

for adults would require its own validation, since it was developed and validated with students aged 7 to 14.

Conclusion

Integrating structured teaching and performance of magic effects into the Parkinson's Disease Boot Camp proved feasible and was met with consistently high engagement. Providers observed changes across motor, speech, cognitive, and psychosocial domains, including hand control, standing balance, voice projection, task sequencing, and reduced bradykinesia during mirrored movement. These were clinical observations recorded by the students and faculty who delivered the sessions; no standardized outcome measures were administered, so they generate a hypothesis but do not demonstrate an effect. They are sufficient to justify a properly measured feasibility study and to identify the outcome domains such a study should target. The evidence base for magic-based intervention has been built almost entirely with children. Whether it transfers to adults living with progressive neurological condition is an open and answerable question, and this camp offers a practical setting in which to address it.

Declarations

Conflict of Interest: Kevin Spencer developed the Magic Therapy® framework described in this report and earns income from related training and publications. Patricia Brown declares no conflict of interest.

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Ethical Approval and Consent: The Parkinson's Disease Boot Camp is a clinical education activity of the Chapman University Doctor of Physical Therapy program. The observations reported here were collected from participants as part of routine internal program assessment and student coursework. The activity did not meet the institutional definition of human subjects research, and Institutional Review Board approval was not required.

Author Contributions: Patricia Brown directed the camp and supervised student delivery; Kevin Spencer developed the intervention framework. Both authors contributed to reviewing observations and drafting the manuscript, and both approved the final version.

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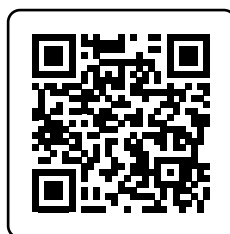
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