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Yoga, Naturopathy, and Lifestyle Interventions in Parkinson's Disease: A Narrative Review of Evidence and Safety

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Abstract

Interest in non-pharmacological interventions, such as exercise, yoga, and dietary modifications, as adjuncts to standard care for Parkinson's disease (PD) is growing. However, the supporting evidence remains variable, and their safety when used alongside dopaminergic therapy warrants careful consideration. This narrative review aimed to assess the strength of PD-specific evidence for individual modalities of yoga, naturopathy, and related lifestyle interventions; identify the symptoms they may target; and examine PD-specific safety concerns. As no clinical trial or cohort study evaluating yoga and naturopathy as an integrated program in PD was identified, we evaluated yoga, tai chi, meditation, exercise, acupuncture and acupressure, massage, hydrotherapy, diet, fasting, light therapy, lifestyle factors, *Mucuna pruriens*, and selected nutritional supplements. The review was based on a purposive search of English-language articles indexed in PubMed from 2016 to 2026. Each intervention was classified according to study design and directness of evidence for PD (randomized evidence in PD, indirect clinical evidence, mechanistic data only, or traditional claim). The direction of effect was recorded separately, and interventions without PD-specific studies were labelled as lacking evidence. Structured exercise, tai chi, and mindfulness-based yoga and meditation have the most consistent randomized evidence, primarily for improvements in balance, mobility, anxiety, and quality of life. Probiotics and prebiotic fiber have randomized evidence supporting their benefits for constipation, while aquatic exercise probably improves quality of life. Acupuncture and plantar acupressure have demonstrated preliminary benefits for sleep and freezing of gait, respectively, and an Indian trial suggests that slow pranayama may provide autonomic and mood benefits. Evidence for light therapy is inconsistent, while dietary interventions are supported mainly by observational studies and small trials. No PD-specific studies evaluating therapeutic fasting alone or passive thermal hydrotherapy were identified. Observational data associate physical activity and Mediterranean-style diets with a reduced risk or delayed onset of PD; however, no studies evaluating yoga or naturopathy for PD prevention were identified. Certain practices also pose PD-specific safety risks: high-protein meals may reduce levodopa efficacy, *Mucuna pruriens* introduces unmeasured amounts of levodopa, and heat exposure, fasting, and forceful breathing may worsen orthostatic hypotension. Interventions supported by available evidence may be considered supervised adjuncts to standard care, with their selection guided by the targeted symptoms and the strength of the supporting evidence.

Categories: Neurology, Physical Medicine & Rehabilitation, Integrative/Complementary Medicine
Keywords: acupuncture, complementary and alternative therapies, exercise therapy, gut-brain axis, levodopa, meditation, orthostatic hypotension, parkinson's disease, yoga and naturopathy

Introduction And Background

Parkinson's disease (PD) is an increasingly significant public health concern, with approximately 25.2 million people projected to be living with the disease worldwide by 2050, more than double the estimated number in 2021 [1]. Although PD is diagnosed based on its motor symptoms, many of its most disabling manifestations are non-motor features, including constipation, urinary dysfunction, depression, psychosis, apathy, and sleep disturbances [2]. Long-term levodopa therapy may also lead to complications, including dyskinesia and "on-off" fluctuations [3]. A review by the International Parkinson and Movement Disorder Society (MDS) of treatments for non-motor symptoms found that only two-thirds of the included trials were rated as high quality, while no trials met the inclusion criteria for anxiety disorders or rapid eye movement (REM) sleep behavior disorder [2]. Consequently, interest in non-pharmacological and lifestyle interventions as adjuncts to standard care is growing [4].

In India, yoga and naturopathy are among the AYUSH systems of medicine (Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy), which national health policy recognizes alongside biomedical care as complementary and alternative medicine (CAM) [5]. These practices are also delivered in inpatient hospital settings, where individualized programs may combine yoga and meditation, dietary interventions and fasting, mud applications, massage, hydrotherapy, chromotherapy (colored-light therapy), and heliotherapy (therapeutic sun exposure). However, the effectiveness of these inpatient protocols has not yet been studied [6]. CAM use is common among people with PD in India. In one tertiary-

care cohort, 46% of 233 patients reported using CAM, primarily Ayurvedic and homeopathic medicines and acupuncture, and three-quarters of the users considered these practices harmless [7].

These interventions were not specifically designed for PD, as the protocols are used for a range of lifestyle-related disorders [6]. Consequently, people with PD may respond differently to these interventions than other populations. Several disease-specific considerations warrant attention. Orthostatic hypotension, which affects approximately one-third of patients with PD, may be aggravated by heat exposure and hyperventilation [8]. Levodopa absorption is influenced by gastric emptying and may be affected by competition with dietary protein [3]. Patients experiencing motor fluctuations depend on regularly timed medication doses, which may be disrupted by prolonged fasting [9]. Furthermore, falls are among the most commonly reported adverse events in exercise trials [10].

Recent reviews have explored the relationships between lifestyle factors and the risk and progression of PD [11], suggesting that physical activity, dietary interventions, and stress management may help alleviate symptoms and potentially slow neurodegeneration [4]. However, these reviews did not specifically address yoga and naturopathy modalities or their potential interactions with dopaminergic therapy. The present review extends this work by examining modalities commonly used in yoga and naturopathy practice in India, including fasting, hydrotherapy, and mud therapy. Specifically, it evaluates the strength and direction of PD-specific evidence for each modality, identifies the symptoms each may target and their plausible mechanisms of action, and assesses potential risks for individuals receiving dopaminergic therapy. Because no clinical trial or cohort study evaluating the integrated program was identified, the evidence is assessed separately for each modality. Structured exercise, tai chi, and yoga account for most of the available randomized evidence.

Review

Methodology

This narrative review used a purposive literature search of PubMed/MEDLINE for English-language articles published between January 1, 2016, and October 25, 2026. "Parkinson's disease" was combined, in six separate searches, with terms for naturopathy and integrative medicine; exercise; yoga and meditation; hydrotherapy, massage, acupuncture, and light therapy; diet, fasting, and herbal products; and safety-related and mechanistic terms. Searches were limited to reviews, systematic reviews, meta-analyses, randomized controlled trials (RCTs), and guidelines; after removal of duplicates, 2,995 unique records were screened. The search was updated on November 1, 2026, with a supplementary PubMed search without publication-type limits and a targeted web search for Indian trials of yoga and pranayama. The full search strings and record counts are provided in the Appendices.

Eligible sources addressed PD (or PD models, for mechanistic questions) or the practice and policy context of yoga and naturopathy and reported clinical, safety, mechanistic, or disease-risk findings relevant to the aims; case reports, case series, conference abstracts, and non-English articles were excluded. Three authors (YPV, SMS, and PTR) screened titles and abstracts and selected the studies most relevant to the aims, prioritizing guidelines and evidence-based reviews, then meta-analyses and RCTs in people with PD; where several studies addressed the same question, the most recent or most comprehensive was chosen. Disagreements were resolved by discussion, with a senior author (SKJ or SS) consulted when needed. Observational studies, consensus statements, and descriptions of yoga and naturopathy practice and policy were added through reference lists and targeted searches where randomized evidence was lacking or where safety or prevention was addressed. Because no formal screening log was kept, counts at the eligibility stage are approximate: about 60 sources were assessed in detail (about 48 in full text and 11 on the published abstract alone), and about 15 were excluded. In total, 44 sources were included: 31 from the database searches, 8 from reference lists and targeted searches, and 5 from the updated search (Appendices). Because study selection was purposive, we did not construct a systematic flow diagram.

Data extraction was shared among the same three authors: for each source, one author recorded the study design, population, intervention, outcomes, effect estimates with 95% confidence intervals (CIs), adverse events, and design limitations on a standardized form, and another checked them; discrepancies were resolved by discussion. Reported data were verified against the full text where available and otherwise against the published abstract. Findings were synthesized narratively by modality and symptom domain. Because populations, doses, comparators, and outcome measures were heterogeneous, no meta-analysis was attempted, and formal risk-of-bias assessment was not performed; instead, the main design limitations of each trial are stated alongside its findings.

Evidence for each modality was categorized using a four-tier framework developed by the authors for this review: tier 1 includes randomized evidence in individuals with PD; tier 2 covers indirect clinical evidence, such as observational PD data, uncontrolled studies, or trials in other populations; tier 3 consists of mechanistic hypotheses supported by physiological, imaging, biomarker, or animal data without clinical outcomes in PD; and tier 4 includes traditional or practitioner claims without supporting data. Because the tier classification does not indicate direction of effect, Table *1* presents these aspects separately; for example, a large negative trial is tier 1 evidence of no benefit. Tiers reflect study design and directness to

PD, not certainty or magnitude of effect; the framework is not a validated instrument and differs from the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. A mechanistic rationale indicates biological plausibility only and does not imply clinical benefit. Interventions for which no PD studies were identified are labelled "no PD evidence identified" rather than assigned a tier; this denotes an absence of evidence, not evidence of no effect. Tiers were assigned independently by two of the three authors, and disagreements were resolved by consensus with the third.

Intervention	Outcome	Key evidence in Parkinson's disease	Tier	Direction of effect
Aerobic, resistance, and balance exercise	Motor signs, quality of life	Systematic review of 154 RCTs with network meta-analysis [10]	1	Benefit
Exercise types compared	Motor signs, mobility, quality of life	Network meta-analysis of 67 RCTs [12]	1	Benefit
Home-based aerobic cycling	Off-medication motor signs	RCT, n = 130 [13]	1	Benefit
Tai chi	Balance, motor signs, mobility	Meta-analysis of 17 RCTs [14]	1	Benefit
Mindfulness yoga	Anxiety, depression, quality of life	RCT, n = 138 [15]	1	Benefit
Mindfulness yoga and meditation	Anxiety, motor signs, quality of life	RCT, n = 159 [16]	1	Benefit
Yoga	Motor signs, balance, mood, quality of life	Meta-analysis of 10 RCTs [17]	1	Benefit
Yoga	Anxiety	Meta-analysis of seven RCTs of dance or yoga [18]	1	Benefit, high heterogeneity
Hatha yoga	Motor signs, balance, fitness	RCT, n = 49 [19]	1	No between-group difference
Alternate nostril pranayama	Autonomic balance, mood, cognition	Unblinded RCT, n = 86 [20]	1	Benefit
Supervised yoga	Postural stability	Open-label study, n = 17 [21]	2	Preliminary benefit
Mindfulness and meditation	Motor signs, mood	Meta-analysis of eight RCTs [22]	1	Motor benefit only
Psychological and mind-body therapies	Anxiety	Meta-analysis of 13 RCTs [23]	1	Benefit, mainly psychological therapies
Acupuncture	Sleep quality	Sham-controlled RCT, n = 78 [24]	1	Benefit
Acupuncture	Fatigue	Sham-controlled RCT, n = 94 [25]	1	No specific effect
Plantar acupressure	Freezing of gait	RCT, n = 60 [26]	1	Immediate benefit
Massage	Motor signs	Meta-analysis of seven RCTs and one pilot study [27]	1	Benefit, unblinded trials
Aquatic exercise	Quality of life	Network meta-analysis [10]	1	Probable benefit
Passive thermal treatments, mud therapy	Any outcome	No PD evidence identified	–	Unknown
Intermittent fasting	Alpha-synuclein pathology	Mouse model [28]	3	Benefit in animals
Mediterranean or MIND diet	Age at onset	Cross-sectional study [29]	2	Association
Mediterranean diet	Constipation	RCT, n = 36 [30]	1	No added benefit
Ketogenic diet	Non-motor symptoms	Pilot RCT, n = 47 [31]	1	Preliminary benefit
Plant-rich, time-restricted diet	Motor signs	RCT, n = 40 [32]	1	Preliminary benefit
Multistrain probiotic	Constipation	RCT, n = 72 [33]	1	Benefit
	Levodopa response,			

Four-strain probiotic	inflammation	RCT, n = 74 [34]	1	Exploratory benefit
Protein redistribution	Levodopa response	Systematic review [3]	2	Benefit, may cause dyskinesia
Ramadan fasting	Medication safety	Consensus statement [9]	2	Risk with fluctuations
Bright-light therapy	Sleep	Phase 2 RCT, n = 150 [35]	1	Inconclusive
Physical activity	Disease risk	Meta-analysis of eight cohorts [36]	2	Association only
Coffee, smoking, alcohol	Disease risk, dyskinesia	Observational and Mendelian randomization studies [11]	2	Association only
Mucuna pruriens	Motor signs	Crossover RCT, n = 18 [37]	1	Acute benefit

TABLE 1: Evidence tiers and direction of effect for non-drug interventions in Parkinson's disease

DASH: dietary approaches to stop hypertension, MIND: Mediterranean-DASH intervention for neurodegenerative delay, PD: Parkinson's disease, RCT: randomized controlled trial.

Tier 1: randomized evidence in PD. Tier 2: indirect clinical evidence. Tier 3: mechanistic data only (does not imply clinical efficacy). Tier 4: traditional or practitioner claim. "-": no PD evidence identified (absence of evidence, not evidence of no effect).

Pathophysiological targets relevant to non-drug care

PD is now widely viewed as a multisystem synucleinopathy rather than a disorder confined to the substantia nigra [38]. One proposed model distinguishes a "body-first" form, in which alpha-synuclein pathology starts in the enteric or peripheral autonomic nervous system and ascends, from a "brain-first" form with a shorter prodrome [38]. Constipation can precede motor onset by years or even decades, and the MDS recognizes it as a prodromal marker [38]. The gut-origin hypothesis remains disputed, as spread may be bidirectional, and autopsy series seldom find peripheral pathology without central involvement [38]. Table *2* summarizes pathophysiological targets that non-drug therapies may act on, with the clinical evidence for each intervention graded in Table *1*; three of them are discussed below.

Target	Clinical correlate	Proposed link to non-drug interventions (type of evidence)
Corticostriatal network dysfunction	Bradykinesia, gait, cognitive control	Aerobic exercise shifted sensorimotor connectivity toward the relatively spared anterior putamen (imaging within an RCT) [39]
Postural control and sensory feedback	Falls, freezing of gait	Balance training and plantar sensory stimulation may improve postural control (clinical trials) [14,26]
Autonomic failure	Orthostatic hypotension, falls	Heat, large meals, dehydration, and hyperventilation worsen blood pressure regulation (physiological studies) [8]
Gut dysbiosis and intestinal inflammation	Constipation, possibly levodopa response	Probiotics and fiber may modify gut microbiota and bowel function (RCTs and mechanistic studies) [2,34,38]
Levodopa absorption	Delayed or failed doses	Dietary protein competes with levodopa for transport, and meal timing alters response (pharmacokinetic studies) [3]
Stress, inflammation, and biological aging	Anxiety, depression	Mindfulness-based practices lowered interleukin-6 in one RCT (exploratory biomarker) [16]
Sleep-wake regulation	Poor sleep, daytime sleepiness	Timed light exposure may entrain circadian rhythms (inconclusive RCTs)[35,40]

TABLE 2: Pathophysiological targets in Parkinson's disease and proposed links to non-drug interventions

RCT: randomized controlled trial.

The first is autonomic failure. Orthostatic hypotension occurs in around one-third of patients and leads to falls, syncope, fatigue, and slowed thinking on standing [8]. It is made worse by meals, heat, fever,

hyperventilation, alcohol, and exercise [8]. Several naturopathic and yogic practices, such as hot baths, saunas, prolonged fasting, rapid posture changes, and forceful breathing, can therefore challenge blood pressure regulation.

The second is the gut, which is both a potential therapeutic target and the site of levodopa absorption. Case-control studies have repeatedly shown an altered gut microbiota in PD with reduced numbers of bacteria that produce short-chain fatty acids (SCFAs) and increased markers of intestinal inflammation [38]. The findings are not consistent across all cohorts, and most of the studies are cross-sectional, so causality has not been established [38]. Gut physiology also affects therapy: some gut bacteria convert levodopa to dopamine before it is absorbed, and patients who carry more of the responsible bacterial gene require higher levodopa doses [38]. Dietary large neutral amino acids compete with levodopa for the same transporter, mainly at the blood-brain barrier [3].

The third is the link between stress, inflammation, and biological aging. Psychological distress affects 40% to 50% of patients; stress-related shifts in cortisol and pro-inflammatory cytokines offer a plausible bridge between mood and disease course [16]. Accelerated epigenetic aging has been proposed as a further link, but earlier reports relied on samples collected after diagnosis, and in a prospective cohort six epigenetic clocks did not predict PD risk or age at onset [41]; this pathway therefore remains a tier 3 hypothesis.

Appraisal of evidence by modality

Structured Exercise

A Cochrane systematic review of 154 RCTs with network meta-analysis, involving 7,837 people with mostly mild to moderate disease, found most forms of exercise improved motor severity and quality of life compared with passive control. Dance and gait, balance, or functional training probably had moderate effects on motor scores, and there was little evidence of differences between exercise types. Falls and pain were the most commonly reported adverse events [10]. A 2026 network meta-analysis of 67 RCTs similarly ranked walking training highest for motor scores, dance training for mobility, and aquatic training for quality of life [12]. The American Physical Therapy Association guideline strongly recommends moderate- to high-intensity aerobic exercise, resistance training, and balance training [42].

In the Park-in-Shape trial, 130 patients with mild disease followed a gamified home cycling program or a stretching program three times a week for six months. Off-medication motor scores differed by 4.2 points (95% CI 1.6-6.9) in favor of aerobic exercise [13]. An imaging substudy of 57 participants found a shift in corticostriatal sensorimotor connectivity toward the relatively spared anterior putamen, better cognitive control, and less global brain atrophy after aerobic training [39].

Tai Chi and Yoga

Tai chi has a substantial body of trial evidence in PD. A 2026 meta-analysis of 17 RCTs involving 914 participants with PD found that tai chi improved balance, motor scores, and mobility, whereas evidence for fall-related psychological outcomes such as fear of falling was limited and imprecise [14].

In inpatient yoga and naturopathy settings in India, yoga is part of an individualized program in which daily postures, breathing exercises, and meditation are combined with diet, mud packs, and hydrotherapy [6]; the yoga tested in PD trials has instead been a standardized group program. A recent three-arm trial randomized 159 patients to mindfulness meditation, mindfulness yoga, or usual care, delivered as weekly 90-minute group sessions for eight weeks [16]. The yoga program combined controlled breathing, 12 modified sun salutation postures, and guided meditation. Both active arms improved anxiety, motor scores, and quality of life at eight weeks, although only meditation reduced depression. Serum interleukin-6, a secondary outcome, was lower than with usual care at six months (meditation: mean difference -1.14, 95% CI -2.18 to -0.10; yoga: -1.11, 95% CI -2.09 to -0.13), an exploratory finding that does not indicate an effect on disease progression. Adverse events possibly related to the sessions occurred in about 6% of each active group [16]. In the group's earlier trial of 138 patients, mindfulness yoga matched stretching and resistance training for motor outcomes but improved anxiety, depression, and quality of life more [15].

A meta-analysis of 10 RCTs (359 participants) found that yoga improved motor scores (mean difference -5.64, 95% CI -8.57 to -2.70), balance, mobility, anxiety, depression, and quality of life [17], and a later meta-analysis found that yoga reduced anxiety, with high heterogeneity [18]. Individual trials are not uniformly positive: a 12-week hatha yoga RCT of 49 patients found no between-group differences in motor scores, balance, or fitness [19]. Two studies from India add to this evidence. An unblinded RCT of 86 patients with mild disease found that 12 weeks of slow alternate nostril (Anulom Vilom) pranayama improved heart rate variability, cognition, mood, and quality of life, although motor outcomes were not assessed [20], and an open-label study of 17 patients reported better postural stability after one month of supervised yoga [21].

In summary, yoga, mainly in mindfulness-based form, has tier 1 evidence for improving anxiety and quality of life, with less consistent effects on motor symptoms. One group in Hong Kong conducted the two largest

trials using mindfulness-based protocols [15,16]; whether these findings apply to the residential yoga therapy offered in yoga and naturopathy hospitals in India has not been tested. Claims that specific postures or cleansing practices address PD pathology have no clinical support (tier 4). Because hyperventilation can worsen orthostatic hypotension [8], practices involving rapid, forceful breathing such as kapalabhati require caution, unlike the slow breathing tested in the pranayama trial [20]. The gentle protocols studied in clinical trials should not be considered evidence for the safety of inversions or rapid forward bends in patients with postural instability.

Meditation and Psychological Approaches

A 2026 meta-analysis of 13 RCTs found that psychological and mind-body interventions reduced anxiety in PD (Hedges' g -0.46) [23]. The effect was largest for cognitive-behavioral and interpersonal therapies, whereas the estimate for mindfulness and mind-body approaches alone was smaller and not statistically significant [23]. An earlier meta-analysis of eight mindfulness and meditation trials found improved motor scores and cognition but no significant effect on depression or anxiety [22]. The MDS review rated cognitive behavioral therapy as likely efficacious for depression [2]. Meditation is nevertheless a low-risk option with tier 1 support from a dedicated trial [16], provided it complements and does not delay the assessment and treatment of major depression.

Acupuncture and Acupressure

Sham-controlled acupuncture trials point in different directions. In a US trial of 94 patients with fatigue, real and sham acupuncture improved fatigue to the same extent, suggesting a largely non-specific effect [25]. In a double-blind trial of 78 patients with poor sleep from a single center in Guangzhou, by contrast, real acupuncture improved sleep quality scores by about 20 points more than sham at four weeks, and the difference persisted at eight weeks [24].

Acupressure has been tested for freezing of gait. In an open-label trial of 60 patients who froze while on medication, a single session of self-applied Thai acupressure to two plantar points on each foot using silicone pads increased stride length by about 13.5 cm and reduced freezing episodes compared with the same routine performed on a flat surface [26]. No adverse events occurred, but the study measured only immediate effects. Both techniques therefore have early tier 1 support that awaits replication.

Massage and Manual Therapy

A meta-analysis of seven RCTs and one pilot study (eight trials; 363 participants) found that massage improved motor scores (standardized mean difference -0.46) but not activities of daily living; blinding was not possible [27]. The MDS review found insufficient evidence for abdominal massage in constipation [2], and no controlled trials of spinal manipulation or other manual therapy for PD-related pain or posture were identified. Massage may be reasonable for comfort and stiffness, with lighter pressure advisable for frail patients and those taking anticoagulants.

Hydrotherapy and Thermal Therapies

Hydrotherapy covers two broad practice groups: aquatic exercise and passive thermal treatments. Aquatic exercise has tier 1 support: a Cochrane network meta-analysis found aqua-based training likely provides a large benefit for quality of life [10]. According to the physiotherapy guideline, therapists may choose aquatic rather than land-based therapy when the aim is to reduce fear of falling or improve quality of life [42]. No PD studies of passive thermal treatments (hot immersion baths, steam, sauna, and hot packs), mud therapy, spinal sprays (water jets applied along the spine), or hip baths (sitting immersion of the pelvis) were identified. In naturopathy, such treatments are intended to restore physiological homeostasis [6], and induction of heat shock proteins has been proposed as a mechanism for passive heating [43], but there is no clinical evidence for their use in PD, and heat is a known trigger for orthostatic hypotension [8].

Diet and Nutrition

Dietary evidence in PD comes mainly from small trials and observational studies. In a cross-sectional study of 167 people with PD, closer adherence to the Mediterranean-Dietary Approaches to Stop Hypertension (DASH) Intervention for Neurodegenerative Delay (MIND) diet was associated with onset up to 17.4 years later in women, and adherence to a Greek Mediterranean diet with onset up to 8.4 years later in men, comparing the highest with the lowest tertiles [29]. Because diet was assessed after diagnosis with a single food frequency questionnaire, recall bias and reverse causation cannot be excluded, and these estimates are hypothesis-generating. In a randomized trial of 36 constipated patients, the Mediterranean diet relieved constipation no more than standard care, though participants ate more fiber and tended toward lower fecal calprotectin [30]. A pilot RCT of 47 patients comparing low-fat and ketogenic diets for eight weeks found improvement in both arms and greater gains in non-motor experiences of daily living with the ketogenic diet, and some on the ketogenic diet had transient worsening of tremor or rigidity [31]. A six-month, assessor-blinded trial in 40 patients of a plant-rich, low-glycemic diet with a 12-hour overnight fast

reported an 11-point fall in motor scores versus a 2.1-point rise in controls, but allocation was not concealed, and no mechanistic biomarkers were measured during follow-up [32]. An effect of that size from diet alone requires independent confirmation.

Nutritional evidence is strongest for constipation. The MDS review rated probiotics and prebiotic fiber as efficacious and clinically useful [2]. In a double-blind trial of 72 patients, a multistrain probiotic increased spontaneous bowel movements by 1.3 per week more than placebo over four weeks, without affecting fecal calprotectin [33]. A subsequent multicenter, double-blind trial randomized 74 constipated patients to a four-strain probiotic or placebo for 12 weeks. The probiotic enriched certain bacterial groups, lowered plasma tumor necrosis factor-alpha, shortened time to "on" after levodopa, and reduced non-motor symptom scores, without changing SCFA levels; analysis was per protocol [34]. These findings suggest links between the gut, inflammation, and drug response but remain exploratory, and they apply only to the formulations tested rather than to probiotic products in general.

For people taking levodopa, meal composition and timing also matter. Protein-rich meals shorten and weaken the levodopa response, and shifting most protein to the evening meal improves motor performance but has been accompanied by dyskinesias and a need for lower levodopa doses [3]. Ferrous sulfate reduces levodopa absorption, vitamin C may improve it in people who absorb it poorly, and immediate-release levodopa is best taken 30 to 60 minutes before meals [3].

Fasting and Meal Timing

Fasting and diet are important components of inpatient yoga and naturopathy protocols [6], but the proposed metabolic and anti-inflammatory effects of fasting in neurodegeneration are still under investigation, with supporting data so far limited to animal models [28]. The plant-rich, time-restricted diet trial described above is the only randomized trial in PD identified that included fasting, and fasting was not tested separately [32]. For Ramadan fasting, a 2025 consensus statement classifies patients with early disease on simple regimens as low risk, recommends consolidated or long-acting treatment for those taking several levodopa doses daily, and considers those with troublesome fluctuations often unsuitable for fasting; it also warns that dehydration and irregular drug absorption can worsen orthostatic hypotension, hallucinations, and swallowing difficulties [9]. These concerns are likely to apply equally to naturopathic fasting, and prolonged water or juice fasts, for which no PD studies were identified, should not be undertaken without neurological supervision.

Light Therapy and Sleep

Chromotherapy and heliotherapy are part of naturopathy protocols [6], but no PD studies of either were identified; the closest tested intervention is bright-light therapy for sleep. A pilot trial in 31 patients found that bright light improved daytime sleepiness and that both bright and dim-red light improved sleep quality over 14 days [40]. The larger ENLITE PD phase 2 trial randomized 150 patients to bright or dim-red light regimens. Twice-daily bright light yielded the greatest improvement in sleep scores, but neither daily regimen met the prespecified threshold for a phase 3 trial, and dim-red light was not an inert control [35]. Light therapy was well tolerated and is biologically plausible for circadian disruption, but its superiority over control conditions remains uncertain.

Everyday Lifestyle Factors

Higher caffeine intake has been linked to less dyskinesia after about six years of treatment [11], suggesting that blanket advice to avoid coffee may not be warranted. Smoking and alcohol intake have been associated with lower PD risk in observational and Mendelian randomization studies [11], but whether this reflects a protective effect or a premorbid predisposition is uncertain, and neither can be recommended given their well-established harms.

Botanical and Nutritional Supplements

Mucuna pruriens is the botanical with the most defined pharmacology, as its seeds contain levodopa. In a double-blind crossover study of 18 patients with advanced PD in Bolivia, roasted seed powder contained 5.7% levodopa and no decarboxylase-inhibiting compounds. Single doses of 12.5 or 17.5 mg/kg levodopa produced motor responses comparable to or greater than dispersible levodopa with benserazide at 3.5 mg/kg, with fewer dyskinesias [37]. *Mucuna* is thus a levodopa preparation requiring much higher doses, and the trial evaluated only single doses. When added unsupervised to prescribed levodopa, it risks levodopa excess; its use, if any, should be limited to supervised protocols where commercial levodopa is unavailable.

Other Ayurvedic botanicals, although commonly used by people with PD in India [7], were outside the scope of this review because their PD-specific trial evidence is sparse and often concerns non-standardized multi-herb formulations.

Prevention and the prodromal phase

Prevention evidence is entirely observational. A meta-analysis of eight prospective cohorts (544,336 participants, 2,192 incident cases) found that the highest levels of total and moderate-to-vigorous physical activity were associated with a 21% and 29% lower risk of PD, respectively, while light activity showed no association [36]. Mediterranean and MIND dietary patterns have been linked to later onset [29], and coffee consumption to lower risk [11]. Reverse causation is a concern, as constipation and other non-motor symptoms may precede diagnosis by years [38]. No study evaluating whether yoga, fasting, hydrotherapy, or other naturopathic programs prevent or delay PD was identified, so such claims have no clinical support. Because gut and autonomic changes are already present in the prodromal phase [38], individuals with REM sleep behavior disorder or chronic constipation may be suitable candidates for future trials of supervised exercise and dietary interventions. Any such program would need to account for the PD-specific risks summarized in Table *3*.

Practice	Risk in PD	Mechanism	Suggested precaution
High-protein meals	Delayed or failed levodopa doses	Amino acid competition for transport [3]	Levodopa 30-60 minutes before meals, with supervised protein redistribution [3]
Protein redistribution	Dyskinesia	Stronger levodopa effect [3]	Review levodopa dose when starting [3]
Iron supplements	Weaker levodopa effect	Reduced absorption [3]	Separate from levodopa doses by about 2 hours [3]
Prolonged or religious fasting	“Off” periods, hypotension, hallucinations, swallowing difficulty	Missed doses, dehydration, irregular absorption [9]	Neurological review beforehand, long-acting regimens, and avoidance if fluctuations are marked [9]‡
Hot baths, steam, sauna, hot packs	Syncope, falls	Heat aggravates orthostatic hypotension [8]	Short exposure, assisted transfers, blood pressure checks†
Forceful breathing, rapid posture change	Hypotension, falls	Hyperventilation and postural change [8]	Gentle, supervised protocols†
Mucuna pruriens	Dyskinesia and other effects of levodopa excess	Unmeasured additional levodopa [37]	Use only under medical supervision†
Ketogenic diet	Weight loss, transient tremor or rigidity	Altered intake [31]	Dietitian supervision†
Acupuncture, firm massage	Bleeding	Anticoagulants†	Check anticoagulation†
Electroacupuncture or other electrical stimulation	Device interference	Deep brain stimulation hardware†	Avoid electrical stimulation near implants†
Unsupervised exercise in advanced disease	Falls, injury [10]	Postural instability	Physiotherapist-led progression [42]

TABLE 3: Parkinson’s disease-specific risks and suggested precautions

Cited entries are based on Parkinson's disease (PD) clinical studies, systematic reviews, guidelines, or consensus statements.

†Based on clinical reasoning; not evidence-based. ‡Extrapolated to therapeutic fasting from guidance on Ramadan fasting. All precautions require individualization by the treating neurologist and CAM practitioner.

Discussion

Symptomatic Benefit

The strongest evidence for interventions in PD supports structured exercise, tai chi, and mindfulness-based yoga and meditation. Effect sizes are mostly small to moderate [10], and longer follow-up is needed [14]. Across modalities, randomized evidence for motor symptoms is strongest for structured exercise and tai chi [10,14], with less certain effects for massage [27] and yoga [17,19]. For non-motor symptoms, randomized evidence supports yoga and meditation for anxiety [15-17], probiotics for constipation [33], and aquatic

exercise for quality of life [10], and a single trial supports acupuncture for sleep quality [24]; acupuncture did not specifically improve fatigue [25], and light therapy has not shown clear superiority over control for sleep [35,40]. Evidence for individual modalities cannot be extended to their combined delivery or to inpatient yoga and naturopathy protocols, neither of which has been evaluated in PD.

Disease Modification

Imaging and inflammatory marker changes have been observed after aerobic, mind-body, and probiotic interventions [16,34,39], but these are surrogate or exploratory outcomes and do not demonstrate disease modification, a possibility raised by recent reviews but not yet tested in long-term trials [4]. A published protocol from India will test whether 18 months of adjunct yoga slows progression in 160 patients with early PD [44].

Safety at the Interface With Dopaminergic Therapy

Extended fasting, hot immersion baths, or high-protein diets may harm people with PD through well-understood mechanisms [3,8,9], and *Mucuna pruriens* acts as an unmeasured levodopa supplement rather than a benign herbal tonic [37]. Integrative and residential programs could reduce these risks by reviewing medication regimens with the treating neurologist before fasting [9], timing levodopa around protein-rich meals [3], and screening for orthostatic hypotension by measuring blood pressure supine and after standing, with limited heat exposure for those affected [8]. Exercise, tai chi, and mindfulness-based yoga could form the core of such programs, with acupuncture, acupressure, probiotics, or dietary changes added for specific symptoms.

Research gaps

Most trials of yoga, meditation, acupuncture, and acupressure come from single research groups or centers and require multicenter replication with rigorous attention or sham controls and extended follow-up. We identified no studies evaluating passive hydrotherapy, mud therapy, therapeutic fasting alone, or residential naturopathy programs in PD; this reflects an evidence gap rather than evidence of no effect, and pragmatic trials of these programs as delivered in India, supervised jointly with the treating neurologist, are a priority. Initial studies should prioritize orthostatic blood pressure, fall risk, and levodopa response as primary safety outcomes, alongside validated motor and quality-of-life rating scales. Dietary intervention trials should use concealed allocation, longer follow-up, and systematic reporting of protein intake and medication timing. Exercise trials have mostly included people with mild to moderate disease without major cognitive impairment [10], so evidence for advanced disease is limited.

Limitations

This review has the typical limitations of a narrative design. The search was limited to PubMed, English-language articles, and publications from 2016 to 2026. PubMed was chosen because it is freely accessible and indexes the main clinical journals, and several included meta-analyses searched additional databases [12,18,22], but Embase, Scopus, and Indian databases were not searched directly, so trials in regional AYUSH journals may have been missed. Study selection and evidence grading reflect the authors' judgment rather than a formal tool such as GRADE, risk of bias was not systematically assessed, and purposive selection carries a risk of selection bias. Counts at the eligibility stage are approximate, and some sources could be checked only against their abstracts. Ayurvedic botanicals other than *Mucuna pruriens* were outside the scope of the review, and some precautions in Table *3* are based on clinical reasoning rather than trial data. Strengths of this review include the separate grading of evidence by strength and direction of effect, the distinction between absent and negative evidence, and the verification of each cited statement against its source.

Conclusions

Non-drug interventions can complement, but not replace, standard PD care, and their evidence and risks differ widely between modalities. Structured exercise, tai chi, and mindfulness-based yoga and meditation are the best-supported options, mainly for balance, mobility, anxiety, and quality of life, whereas most other yoga and naturopathy modalities, including fasting, passive hydrotherapy, and mud therapy, remain preliminary or untested in PD. Safe use requires attention to levodopa timing, orthostatic hypotension, and fall risk, under the supervision of the treating neurologist. Controlled trials of integrated yoga and naturopathy programs, with predefined safety outcomes, are now needed.

Appendices

Search strategy: We ran the final searches in PubMed on October 25, 2026, limiting publication dates to January 1, 2016, to October 25, 2026. Field tags are shown here in parentheses; in PubMed, they are entered in square brackets. Each search combined ("Parkinson Disease"(MeSH) OR "Parkinson's disease"(tiab)) with one of the term groups below and with the limits (review(pt) OR systematic review(pt) OR meta-analysis(pt) OR randomized controlled trial(pt) OR guideline(pt)) AND english(la).

Search 1 (428 records): naturopathy(tiab) OR naturopathic(tiab) OR "nature cure"(tiab) OR "Complementary Therapies"(MeSH) OR "Integrative Medicine"(MeSH).

Search 2 (1,115 records): exercise(tiab) OR "physical activity"(tiab) OR "tai chi"(tiab) OR aquatic(tiab).

Search 3 (154 records): yoga(tiab) OR pranayama(tiab) OR meditation(tiab) OR mindfulness(tiab) OR "cognitive behavioral therapy"(tiab).

Search 4 (195 records): hydrotherapy(tiab) OR balneotherapy(tiab) OR sauna(tiab) OR "mud therapy"(tiab) OR massage(tiab) OR acupuncture(tiab) OR acupressure(tiab) OR "light therapy"(tiab).

Search 5 (807 records): diet(tiab) OR ketogenic(tiab) OR Mediterranean(tiab) OR fasting(tiab) OR Ramadan(tiab) OR probiotics(tiab) OR "Mucuna pruriens"(tiab) OR herbal(tiab).

Search 6 (987 records): "orthostatic hypotension"(tiab) OR "drug interactions"(tiab) OR "Food-Drug Interactions"(MeSH) OR "gut microbiota"(tiab) OR "DNA methylation"(tiab).

Flow of records: The six searches retrieved 3,686 records on October 25, 2026. When re-run on November 1, 2026, with the same limits, they retrieved 3,695 records (428; 1,116; 154; 198; 809; 990); 700 duplicates were removed, leaving 2,995 unique records for title and abstract screening. Because no formal screening log was kept, the following counts are approximate: about 60 sources were assessed for eligibility across all routes (about 48 in full text and about 11 on the published abstract where the full text was unavailable), about 15 were excluded, and 44 were included. The main reasons for exclusion at the full-text stage were supersession by a more recent or more comprehensive source on the same question, absence of PD-specific clinical or safety outcomes, and interventions outside the scope of the review.

Sources included from the database searches (n = 31): [2-4,8-18,22-25,27,30-40,43].

Sources added from reference lists and targeted searches (n = 8): [1,5-7,26,29,41,42].

Supplementary search (November 1, 2026): PubMed, 2016 to 2026, without publication-type limits: parkinson*(ti) AND (yoga(tiab) OR pranayama(tiab) OR asana*(tiab) OR naturopath*(tiab)) AND (randomized(tiab) OR randomised(tiab) OR trial(tiab) OR controlled(tiab)) (54 records); and parkinson*(ti) AND (sauna(tiab) OR "hot bath"(tiab) OR balneotherapy(tiab) OR "spa therapy"(tiab) OR mud(tiab) OR "thermal water"(tiab) OR "heat therapy"(tiab) OR "intermittent fasting"(tiab) OR "time-restricted"(tiab) OR "caloric restriction"(tiab) OR "fasting mimicking"(tiab)) (25 records). A targeted web search was also run for Indian trials of yoga and naturopathy in PD, using the queries: naturopathy yoga Parkinson's disease India clinical trial CTRI inpatient; and "Parkinson" yoga randomized trial India NIMHANS OR SVYASA OR AIIMS 2024 2025 2026. Two sources already among the database records [17,43] and five further sources [19-21,28,44] were added.

Additional Information

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All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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