https://nmsjournal.kaums.ac.ir/
Nursing and Midwifery Studies. 2025; 14(4): 265-274
https://doi.org/10.48307/nms.2025.503215.1558

Research Article Open Access

The effect of chamomile extract on motor function and quality of life in persons with Parkinson's disease: A randomized placebo-controlled trial

Seyed Ali Masoud [1], Mohsen Adib-Hajbaghery [2*], Mahsa Dadkhah-Tehrani [2], Zeynab Hakimzadeh [2]

[1] Department of Neurology, Kashan University of Medical Sciences, Kashan, Iran
[2] Trauma Nursing Research Center, Kashan University of Medical Sciences, Kashan, Iran

[*] **Corresponding author: Mohsen Adib-Hajbaghery.** Trauma Nursing Research Center, Kashan University of Medical Sciences, Kashan, Iran. **Email:** adib1344@yahoo.com

Received: 29 January 2025 **Revised:** 8 June 2025 **Accepted:** 20 August 2025 **e-Published:** 30 September 2025

Abstract

Background: Parkinson's disease (PD) is a progressive neurological disorder that impairs motor function (MF) and reduces quality of life (QOL). Although animal studies suggest that chamomile extract may enhance MF and muscle endurance in PD models, its effects in humans remain unexplored.

Objectives: This study evaluated the impact of chamomile extract on MF and QOL in individuals with PD.

Methods: In 2022, a double-blind, randomized, placebo-controlled trial was conducted in Kashan, Iran, including 50 patients with PD, randomized into two groups via block randomization. One group received chamomile extract capsules, while the other received wheat flour capsules, for 28 days. Data were collected at baseline and after the intervention using a demographic questionnaire, the Short Parkinson's Evaluation Scale for Outcomes in Parkinson's Disease (SPES/SCOPA), and the Parkinson's Disease Questionnaire (PDQ-39). Analyses followed intention-to-treat (ITT) principles and complete-case approaches, employing Kolmogorov-Smirnov, Chi-square, Fisher's exact, Mann-Whitney U, Wilcoxon signed-rank, and Quade's tests.

Results: Baseline QOL scores did not differ significantly between groups (chamomile: 92.02±11.27; placebo: 88.46±15.88; P=0.56). Post-intervention, QOL improved in both groups, although the between-group difference was not statistically significant (67.94±31.50 vs. 63.12±32.15; P=0.68). The chamomile group had a higher baseline MF score than the placebo group (65.16±6.59 vs. 59.32±10.42; P=0.03). By the end of the study, MF scores declined in both groups, without significant between-group differences (56.07±16.25 vs. 54.77±21.80; P=0.31).

Conclusion: Compared with placebo, chamomile extract was associated with modest improvements in MF and QOL. The observed changes in the placebo group may reflect psychological effects. Further studies with larger samples, higher dosages, and extended follow-up are warranted.

Keywords: Parkinson disease, Chamomile, Quality of life, Motor activity.

Introduction

Parkinson's disease (PD) is the second most prevalent neurodegenerative disorder after Alzheimer's disease, with multifactorial etiology. Its pathophysiology involves alpha-synuclein aggregation, mitochondrial dysfunction, neuroinflammation, and oxidative stress, ultimately leading to reduced dopaminergic signaling and neuronal death.[1] Oxidative stress and free radicals are key contributors to PD pathogenesis.[2] The prevalence of PD increases with age, affecting approximately 1% of individuals over 60 years and 4% of those over 80 years.[3] In Tehran, Iran, the estimated prevalence ranges from 129 to 156 cases per 100,000, exceeding rates reported in Eastern Asian and African populations.[4]

Motor impairments are hallmark features of PD, often beginning in the hands and progressing to the lower extremities. Gait abnormalities, including reduced walking speed, short steps, joint rigidity, limited lower

limb mobility, shuffling, and balance deficits, increase the risk of falls, particularly during changes in direction or obstacle navigation.[5] As PD progresses, it frequently leads to declining mobility, increased disability, and reduced quality of life (QOL).[6] These complications contribute to higher morbidity and mortality rates and a growing need for both formal and informal caregiving.[7]

QOL represents an individual's perception of their life situation within the context of their culture and value system, shaped by personal expectations, priorities, and circumstances.[8] Health-related QOL specifically reflects aspects of life affected by disease or health status.[9]

The World Health Organization (WHO) reports that over 30% of the global population lacks access to essential medicines due to high costs, prompting widespread use of herbal remedies.[10] Approximately 65% of individuals worldwide utilize herbal medicines for health conditions.[11] This trend is driven by dissatisfaction with conventional therapies, perceived natural benefits and lower side effects of herbal products, cost considerations, expansion of herbal cultivation industries, and government policies aimed at reducing foreign currency expenditure.[12] Consequently, there is growing scientific interest in investigating the physiological and pharmacological effects of medicinal plants.

Chamomile (Matricaria chamomilla) is a well-established medicinal herb with a long history of use in traditional medicine, including Iranian medicine, for its antispasmodic, anti-inflammatory, and neuroprotective properties. It is recognized globally in pharmacopoeias for its safety and rich content of bioactive compounds, particularly flavonoids such as apigenin, which exhibit antioxidant, anti-inflammatory, muscle-relaxant, neuroprotective, and free radical scavenging effects.[13,14] These pharmacological properties are particularly relevant to PD, in which oxidative stress and neuroinflammation are central to disease pathogenesis. Preclinical studies indicate that chamomile and its flavonoids can modulate PD-associated biomarkers, including interleukin-6, tumor necrosis factor-alpha, malondialdehyde, alpha-synuclein, tyrosine hydroxylase, and dopamine receptors.[1,13,14]

Clinically, chamomile has been shown to improve sleep quality in older adults and reduce anxiety, suggesting potential neuromodulatory effects.[15-17] Although animal studies demonstrate chamomile's neuroprotective potential and improvements in motor coordination in PD models,[13,18] there is a lack of human clinical trials evaluating its efficacy in PD. A comparative study investigating saffron and chamomile in PD management is ongoing, with results pending.[1] Importantly, chamomile is widely consumed as a complementary remedy with a well-characterized safety profile, such as in teas and extracts, which distinguishes it from investigational drugs requiring formal clinical trials. Its established safety, historical use, and minimal adverse effects support the rationale for transitioning from preclinical models to human studies.[19,20] Additionally, chamomile's flavonoid content and documented anti-inflammatory and antioxidant effects have shown benefits in neurological conditions including anxiety and sleep disorders.[16,21-23]

Healthcare professionals, including nurses and physicians, play a crucial role in monitoring motor function and QOL in older adults with PD. Given the encouraging preclinical evidence, the limited human data, and recommendations from previous studies for further investigation, the efficacy of chamomile extract in improving MF and QOL in PD remains unclear. This study was designed to evaluate chamomile extract as a complementary intervention in PD patients, grounded in mechanistic rationale and established human safety, rather than as an experimental pharmaceutical agent.

Objectives

Considering the widespread positive perception of complementary and traditional therapies, this trial aimed to investigate the effects of chamomile extract on motor function and QOL in individuals with Parkinson's disease.

Methods

Study design and participants

This study was a double-blind, randomized, placebo-controlled trial conducted on 50 patients diagnosed with Parkinson's disease (PD) who were referred to a neurologist's office in Kashan, Iran, for routine monitoring and treatment in 2022 (from May to December). The study spanned eight months, including recruitment, intervention, and follow-up.

Due to the absence of prior human studies examining the effects of chamomile on motor function (MF) or QOL in PD, sample size calculations relied on two complementary approaches. The first approach was based on preclinical evidence indicating that chamomile's bioactive constituents -particularly apigenin and α-bisabolol- modulate dopaminergic pathways and reduce neuroinflammation, key mechanisms in PD progression. These mechanisms are also associated with improvements in sleep quality, which is linked to both MF and QOL in PD.[23,24] Using data from a study assessing the effects of

chamomile extract on sleep quality in older adults, where mean sleep scores were 9.13±2.44 in the intervention group and 11.40±2.94 in the control group,[16] and considering α=0.05 and β=0.20, the calculated sample size was 23 participants per group using the formula for comparing two means.

The second approach involved a pilot study including seven PD patients treated with chamomile extract capsules similar to those planned for the main trial. In this pilot, QOL scores decreased from 84.79±16.32 at baseline to 72.21±13.25 post-intervention, while MF scores decreased from 64.28±4.68 to 57.42±9.42. Based on these outcomes, the required sample size was calculated as 22 per group for QOL and 19 per group for MF. To account for potential attrition, 25 participants were enrolled in each group.

Inclusion and Exclusion Criteria

Eligible participants were aged 20–80 years, had a confirmed diagnosis of PD, were conscious, able to communicate verbally, and could complete the study questionnaires. Participants with known allergies to chamomile or its byproducts, prior chamomile use, cognitive disorders, or those taking anticoagulant medications (e.g., Plavix, heparin, aspirin, warfarin) were excluded. Additional exclusions included substance use (opioids, alcohol, painkillers, antidepressants, hypnotics), comorbid conditions such as asthma, malignancy, diabetes mellitus, lupus erythematosus, heart failure, or significant psychological, nephrological, or hepatic disorders documented in medical records. Participants were also required to provide informed consent.

Exclusion criteria during the study included inability to tolerate chamomile, allergic reactions, failure to take capsules for three consecutive days, hospitalization, or death. Seven participants passed away due to age-related causes but were included in the intention-to-treat analysis using imputation for missing data.

Randomization and blinding

A permuted block randomization plan was generated using a web-based random number generator (https://www.sealedenvelope.com/simple-randomiserv1/lists/). Fifty patients were allocated into nine blocks (seven blocks of six participants and two blocks of four) to ensure balanced group assignment. Patients were sequentially enrolled based on clinic visits and assigned to groups according to the predetermined sequence.

Eligible patients were invited by the neurologist to participate, briefed on the study procedures, and allocated to either the chamomile or placebo group. The neurologist monitored patient progress, recorded all clinical data, and performed motor function assessments throughout the study. Both participants and the investigating physician were blinded to the treatment allocation. Capsules were prepared in identical containers labeled only with codes "A" or "B," and this allocation was concealed until the end of the trial.

Data collection instruments

The data collection instrument included three sections. The first section collected demographic information, including age, sex, marital status, literacy, occupation, and history of anti-Parkinson drug use. The second section assessed motor function using the Short Parkinson's Evaluation Scale for Outcomes in Parkinson's Disease (SPES/SCOPA). This instrument consists of 21 items across three subscales: motor evaluation (10 items), daily living activities (7 items), and motor complications (4 items, including dyskinesia and motor fluctuations). Each item is scored 0–3, yielding a total score ranging from 0 to 63, with higher scores indicating more severe motor impairment. SPES/SCOPA demonstrates high inter-rater reliability (individual item reliability 0.70–0.95) and correlates strongly with the Unified Parkinson's Disease Rating Scale (r=0.85).[25]

QOL was evaluated using the Parkinson's Disease Questionnaire (PDQ-39), which includes 39 items across eight dimensions: mobility (10 items), activities of daily living (6 items), emotional well-being (6 items), stigma (4 items), social support (3 items), cognition (4 items), communication (3 items), and bodily discomfort (3 items). Each item is rated on a 0–4 Likert scale, with dimension scores converted to 0–100. The total score, also standardized to 0–100, reflects overall QOL, with higher scores indicating poorer QOL.[26] The Farsi version of the PDQ-39 demonstrates satisfactory reliability and validity, with Cronbach's α ranging from 0.64 to 0.92 across subscales.[27]

Participants completed the PDQ-39 at baseline and after 28 days of intervention. Motor function assessments were performed by the neurologist at the same time points.

Intervention

Chamomile extract capsules (200 mg; code 4373249861132146) were obtained from Barij Essence Company (Kashan, Iran). The intervention group received two capsules daily (morning and evening) for 28 days, while the placebo group received wheat flour capsules of identical appearance and dosage. The chamomile dose was determined based on prior research.[16] Participants continued their routine anti-Parkinson medications, including Levodopa-c (100/10 mg three times a day), Amantadine (100 mg twice a day), and Biperiden (2 mg

twice a day).

Compliance and adverse events were monitored every other day via phone calls by the research team. No adverse events were reported. After 28 days, participants returned for follow-up evaluation of motor function and QOL by the neurologist.

Ethical considerations

The study protocol was approved by the Research Ethics Committee of Kashan University of Medical Sciences (IR.KAUMS.MEDNT.REC.1400.209) and registered in the Iranian Clinical Trials Registry (IRCT20220421054601N1). All participants provided written informed consent after being informed about study procedures, confidentiality, and the voluntary nature of participation. The study incurred no additional costs for participants, and withdrawal from the study did not affect standard clinical care.

Data analysis

Data were analyzed using SPSS version 16 (SPSS Inc., Chicago, IL, USA). Primary outcomes (QOL and MF) were analyzed according to intention-to-treat (ITT) principles, including all 50 participants. Missing data from participants who died (n=7) were handled using last observation carried forward (LOCF). Subscale analyses were conducted using complete-case (CC) analysis (n=43; 22 chamomile, 21 placebo) to avoid potential bias from imputations in multidimensional measures.

Descriptive statistics included frequencies and percentages. Normality of continuous variables was assessed using the Kolmogorov-Smirnov test. Between-group comparisons were performed using the Mann-Whitney U test due to non-normal distributions, while within-group changes were assessed using the Wilcoxon signed-rank test.

Given a significant baseline difference in MF scores (P=0.004) and non-normality of distributions, a nonparametric analysis of covariance (ANCOVA) using Quade's test was applied to compare post-intervention MF scores while adjusting for baseline values. The group × baseline interaction was nonsignificant (P>0.05), validating the approach. Scores were ranked, adjusted ranks were computed via linear regression of posttest ranks on pretest ranks (R^2=0.241, F(1,41)=13.04, P=0.001), and residual ranks were compared using Mann-Whitney U tests. Effect sizes were calculated as rank-biserial correlations (r=Z/√N) and interpreted using Cohen's thresholds: 0.1 (small), 0.3 (medium), and 0.5 (large). All statistical tests were two-tailed with a significance threshold of α<0.05.

Results

Of the 50 participants enrolled, three in the chamomile group and four in the placebo group died due to age-related causes before post-intervention assessments could be completed. Consequently, 22 participants in the chamomile group and 21 in the placebo group completed the study [Figure-1]. Demographic analyses were conducted based on the intention-to-treat (ITT) population (n=25 per group). Overall, 56% of participants in the chamomile group and 64% in the placebo group were male. Additionally, 88% of participants in both groups had a history of anti-Parkinson medication use. No significant differences were observed between groups regarding baseline demographic characteristics, indicating successful randomization [Table-1].

Quality of Life outcomes

At baseline, mean QOL scores did not differ significantly between the chamomile and placebo groups, irrespective of the analysis method (CC analysis, P=0.45; ITT, P=0.56). Following the 28-day intervention, both groups exhibited significant improvements in overall QOL, with mean scores decreasing substantially (P<0.001). However, between-group comparisons post-intervention showed no statistically significant difference, using either CC (P=0.83) or ITT (P=0.68) approaches. Within-group analyses confirmed these improvements were clinically meaningful, supported by large effect sizes [Table-2]

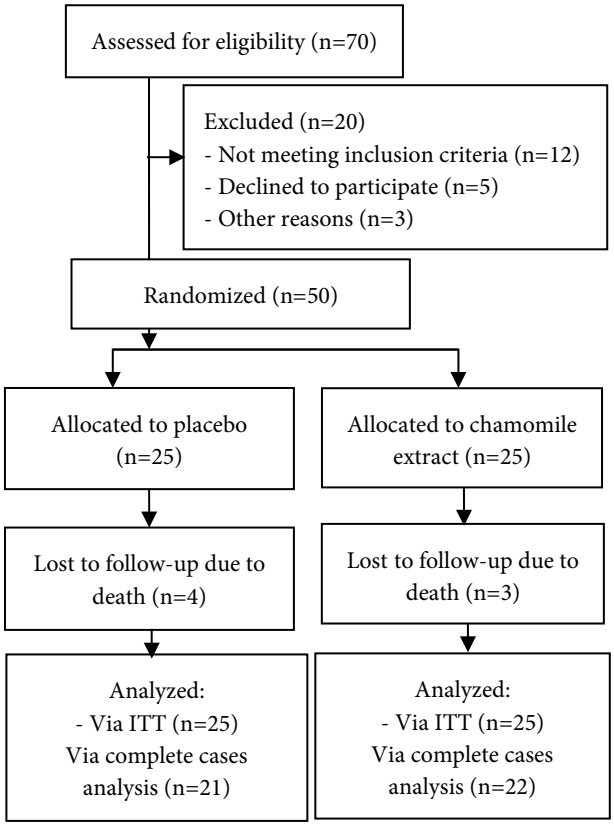

Figure-1. CONSORT flow diagram

Table-1. Comparison of the demographic characteristics between the chamomile and placebo groups

Variable		Chamomile, n=25	Placebo, n=25	P value
Age, mean ± SD		72.56 ± 8.45	70.36 ± 9.04	0.37[a]
		N(%)	N(%)	
Gender	Female	11 (44)	9 (36)	0.56[b]
	Male	14 (56)	16 (64)	
Marital status	Married	25 (100)	25 (100)	0.99[b]
Education	Illiterate	10 (40)	12 (48)	0.66[b]
	Elementary	10 (40)	6 (24)	
	Intermediate and above	5 (20)	7 (28)	
Job	Unemployed	23 (92)	20 (80)	0.41[c]
	Self-employed	2 (8)	5 (20)	
History of receiving anti-Parkinson drugs	Yes	22 (88)	22 (88)	0.99[c]
	No	3 (12)	3 (12)	

[a] Mann–Whitney U test, [b] Chi-square, [c] Fisher's Exact test

Table-2. Comparison of the mean total quality of life and motor function scores between the chamomile and placebo groups using intention to treat (ITT) and complete-case analysis

	Analysis method	Time	Group		P-value[a]	Effect size (r)
			Chamomile	Placebo		
Total quality of life	ITT analysis (LOCF method)	Baseline	92.02±11.27	88.46±15.88	0.56	0.08 (Trivial)
		Post-intervention	67.94±31.50	63.12±32.15	0.68	0.06 (Trivial)
		P-value[b]	<0.001	<0.001		
		Effect size(r)	r=0.63 (Large)	r=0.64 (Large)		
	Complete-case analysis	Baseline	92.62±11.23	88.24±15.49	0.45	0.12 (Small)
		Post-intervention	77.21±19.61	75.15±17.07	0.83	0.03 (Trivial)
		P-value[b]	<0.001	<0.001		
		Effect size(r)	r=0.62 (Large)	r=0.64 (Large)		
Total motor function	ITT analysis (LOCF method)	Baseline	65.16±6.59	59.32±10.42	0.03	0.31 (Small)
		Post-intervention	56.07±16.25	54.77±21.80	0.31	0.17 (Trivial)
		P-value[b]	0.001	0.012		
		Quade's ANCOVA results	-12.00±1.92	-8.22±2.37	0.35	η^2=0.02 (Small)
		95% CI for ranks	[-15.8,-8.2]	[-12.9,-3.6]		
		Effect size(r)	r=0.75 (Large)	r=0.52 (Medium)		
	Complete-case analysis	Baseline	65.54±6.61	59.14±9.86	0.004	0.44 (Medium)
		Post-intervention	51.77±11.17	48.14±14.81	0.16	0.21 (Small)
		P-value[b]	<0.001	<0.001		
		Quade's ANCOVA results	-11.68±2.04	-7.95±2.51	0.41	η^2=0.02(small)
		95% CI for ranks	[-15.7,-7.6]	[-12.9,-3.0]		
		Effect size(r)	r=0.74 (Large)	r=0.51 (Large)		

LOCF: Last Observation Carried Forward; CI: Confidence Interval. [a] Mann–Whitney U test (between-group comparison at each time point), [b] Wilcoxon signed-rank test (within-group comparison from baseline to post-intervention).

Subscale analyses of QOL demonstrated consistent within-group improvements across all domains, including mobility, activities of daily living, emotional well-being, stigma, social support, cognition, communication, and bodily discomfort (P≤0.05 for all). Between-group differences in post-intervention scores for all subscales remained non-significant (P>0.05) [Table-3]. These results indicate that both groups experienced notable improvements in patient-perceived QOL, although no statistically significant advantage was observed for chamomile over placebo.

Motor function outcomes

Baseline MF scores differed significantly between groups, with higher scores observed in the chamomile group, both in CC (P=0.004) and ITT (P=0.03) analyses. After the intervention, both groups demonstrated significant

within-group improvements in MF scores (P≤0.012). Post-intervention, the between-group difference was not statistically significant (CC, P=0.16; ITT, P=0.31). Quade's ANCOVA, adjusting for baseline differences, confirmed no significant effect of group allocation on post-intervention MF scores (CC, P=0.41; ITT, P=0.35). Within-group improvements were accompanied by large effect sizes (rank-biserial correlation: r=0.62 for chamomile and r=0.64 for placebo in ITT analysis) and significant reductions in scores (P<0.001 for both groups across CC and ITT analyses) [Table-3].

Analyses of MF subscales revealed significant within-group improvements across all domains post-intervention (P≤0.002). At baseline, the chamomile group scored higher in the motor evaluation and activities of daily living subscales (P=0.001). However, post-intervention between-group comparisons did not reach statistical significance (P≥0.114), indicating comparable improvements across the chamomile and placebo groups.

Table-3. Comparison of the mean quality of life and motor function score subscales between the chamomile and placebo groups before and after the intervention

QOL domains	Time	Chamomile, n=22	Placebo, n=21	P-value[a]
Mobility	Baseline	96.59±6.34	91.42±11.41	0.27
	Post-intervention	80.45±21.13	77.02±16.42	0.78
	P-value[b]	0.003	<0.001	
Daily living activities	Baseline	95.83±8.90	92.06±12.97	0.52
	Post-intervention	79.54±23.14	76.58±17.75	0.78
	P-value[b]	0.004	<0.001	
Emotional well-being	Baseline	92.42±13.46	91.66±14.31	0.98
	Post-intervention	78.21±22.01	77.77±17.29	0.98
	P-value[b]	0.003	<0.001	
Stigma	Baseline	86.93±21.20	82.73±24.03	0.65
	Post-intervention	73.57±22.97	70.83±20.85	0.77
	P-value[b]	0.002	0.002	
Social support	Baseline	85.98±23.05	78.96±29.29	0.46
	Post-intervention	70.45±26.19	69.84±23.34	0.99
	P-value[b]	0.003	0.007	
Cognition	Baseline	92.89±13.54	88.98±18.42	0.67
	Post-intervention	79.26±19.22	77.08±21.04	0.82
	P-value[b]	0.004	0.002	
Communication	Baseline	90.53±14.83	83.73±23.04	0.53
	Post-intervention	74.62±21.43	73.41±20.17	0.94
	P-value[b]	<0.001	0.003	
Bodily discomfort	Baseline	89.39±18.39	83.33±22.51	0.35
	Post-intervention	71.21±25.16	71.03±20.34	0.92
	P-value[b]	<0.001	<0.001	
MF domains	**Time**	**Chamomile, n=22**	**Placebo, n=21**	**P-value[a]**
Motor evaluation	Baseline	31.95±3.13	28.76±4.74	0.001
	Post-intervention	25.40±5.95	23.23±7.20	0.114
	P-value[b]	0.002	<0.001	
Activities	Baseline	21.40±2.03	18.76±3.52	0.001
	Post-intervention	17.09±3.71	15.66±4.60	0.146
	P-value[b]	0.002	0.002	
Motor complications	Baseline	12.18±2.80	11.61±2.08	0.312
	Post-intervention	9.27±2.35	9.23±3.25	0.750
	P-value[b]	0.002	<0.001	

QOL: Quality of Life, MF: Motor Function. [a] Mann–Whitney U test (between-group comparison), [b] Wilcoxon signed-rank test (within-group comparison).

Discussion

This study investigated the effects of chamomile extract on MF and QOL in patients with PD. Both the chamomile and placebo groups exhibited comparably poor baseline QOL, with no significant between-group differences at the outset. Post-intervention, both groups demonstrated substantial within-group improvements in QOL, supported by large effect sizes. Although the chamomile group exhibited marginally greater improvements, the between-group differences were trivial and statistically non-significant. The improvements observed in the placebo group suggest potential contributions from placebo effects, natural disease variability, or increased clinical attention associated with structured follow-up.[28,29] This finding aligns with previous reports demonstrating notable placebo effects in PD studies, particularly for subjective outcomes such as QOL.[30,31] Chamomile's modest benefit may be attributable to its anxiolytic and neuroprotective properties, although its clinical impact appears limited in the context of PD.[13,32]

Subscale analyses revealed improvements in domains such as emotional well-being and stigma, which correspond with chamomile's reported anxiolytic properties.[33] However, the lack of significant between-group differences suggests that these improvements may reflect non-specific effects of participation in a clinical trial, including attention from healthcare providers and structured care. Similarly, the gains observed in the social support and cognition subscales in the placebo group mirror findings from prior PD trials, where structured care and regular follow-up enhanced patient-perceived support and cognitive engagement.[34] Notably, chamomile did not exert a statistically significant effect on bodily discomfort, contrasting with its reported analgesic effects.[35] This discrepancy may be attributable to the concurrent use of routine pharmacologic treatments or placebo-related symptom amelioration, potentially masking the specific effects of chamomile.

Regarding MF, although baseline scores were higher in the chamomile group, both groups exhibited substantial within-group improvements post-intervention, with large effect sizes for the chamomile group and medium for the placebo group. Between-group differences remained non-significant. Quade's nonparametric ANCOVA, which adjusted for baseline disparities, confirmed the absence of a meaningful treatment effect. The parallel improvements in MF across groups highlight the potential influence of placebo responses, fluctuations in the natural disease course, and heightened clinical attention during the structured follow-up. Furthermore, routine pharmacologic therapies received by participants, including levodopa, amantadine, and biperiden, may have overshadowed the detection of adjunctive effects from chamomile extract.

Chamomile has previously been shown to improve sleep quality and reduce stress.[16] While we did not directly assess sleep and stress in the current study, improvements in these domains may have contributed to the observed enhancements in QOL. Enhancing sleep quality and reducing fatigue may indirectly benefit motor performance, including gait and balance, which are often compromised in PD.[41-43] Despite baseline differences in MF, the absence of significant between-group differences is consistent with the well-documented placebo response in PD, particularly in trials involving structured care protocols.[34,36] The minimal response of motor complications to chamomile, in contrast to robust anti-inflammatory and neuroprotective effects observed in preclinical models,[37] suggests that conventional dopaminergic therapies may dominate motor symptom management, potentially masking additional benefits from herbal interventions.[38,39]

Given the impaired QOL, balance deficits, and postural instability common in PD, identifying safe and effective adjunctive therapies remains a clinical priority. Chamomile's neuroprotective and anti-inflammatory properties suggest potential utility in improving both MF and QOL. Preclinical studies have demonstrated that chamomile's bioactive compounds, including apigenin and α-bisabolol, modulate dopaminergic pathways and reduce neuroinflammation, which are central to PD pathophysiology.[23,24] In experimental PD models, chamomile extract has been shown to significantly enhance motor activities in male Wistar rats.[40] Additionally, chamomile contains multiple antioxidants, such as apigenin, luteolin, quercetin, α-bisabolol, chamazulene, and herniarin, which protect against oxidative stress and improve motor resistance in animal models.[14]

Clinically, limited but promising evidence supports chamomile's benefits in neurological outcomes. For instance, a randomized trial in older adults with insomnia -a common comorbidity in PD- demonstrated improved sleep quality following chamomile extract supplementation.[16] Improved sleep may indirectly enhance MF by reducing fatigue-related gait impairments.[41-43] Nonetheless, no prior studies have specifically evaluated chamomile's effects on PD-related motor symptoms or QOL, underscoring the novelty of the present investigation. These findings highlight the need for further research to elucidate additional factors that

may contribute to observed improvements in both MF and QOL.

Several limitations of this study should be acknowledged. First, the follow-up period was relatively short, which may have limited the observable impact on QOL and MF. Second, the daily dose of chamomile extract was selected based on safety data from studies on sleep quality, which may have been suboptimal for eliciting maximal effects on motor function in PD. Third, the single-center design may limit the generalizability of the findings. While the sample size was sufficient to detect moderate effects, smaller yet clinically meaningful improvements may have remained undetected. Fourth, patient factors such as daily activity levels, disease duration, and PD severity prior to enrollment were not assessed and may have influenced outcomes. Fifth, physician-administered questionnaires, although structured, may have introduced social desirability bias. Future multicenter trials with larger sample sizes, extended follow-up, higher chamomile doses, and subgroup analyses controlling for disease severity are warranted. Incorporating objective measures of motor performance and blinded raters would further mitigate potential recall and response biases.

Conclusion

In summary, both the chamomile and placebo groups exhibited clinically meaningful improvements in QOL, with the chamomile group demonstrating marginally greater enhancements, suggesting potential adjunctive benefits. However, MF improvements were comparable between groups, and no statistically significant between-group differences were observed after adjusting for baseline disparities. These findings suggest that observed changes may reflect placebo responses, natural disease fluctuations, or structured clinical care rather than specific effects of chamomile extract. The pronounced placebo effects underscore the importance of including control groups in PD intervention trials. Given the limitations of this study, caution is warranted in generalizing these results. Future research should investigate the effects of higher chamomile doses and longer intervention and follow-up periods, while rigorously controlling for placebo responses and disease severity, to determine whether more robust benefits can be achieved in this patient population.

Acknowledgment

We extend our heartfelt appreciation to all patients who contributed in this research.

Competing interests

The authors declare that they have no competing interests.

Abbreviations

Parkinson's Disease: PD; Quality of Life: QOL; Motor Function: MF; Short Parkinson's Evaluation Scale: SPES; Parkinson's Disease Questionnaire: PDQ.

Authors' contributions

All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

Funding

This study was supported by the research and technology deputy of Kashan University of Medical Sciences (Grant No. 400162).

Role of the funding source

None.

Availability of data and materials

The data used in this study are available from the corresponding author on request.

Ethics approval and consent to participate

This study was ethically approved by Research Ethics Committee of Kashan University of Medical Sciences (No. IR.KAUMS.MEDNT.REC.1400.209) and was registered on the Iranian Clinical Trials Registry (IRCT20220421054601N1). All participants signed an informed consent form.

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

References

1. Ali F, Ahmed J, Ahmad S. Role of saffron and chamomile in Parkinson diseases. J Pak Med Assoc. 2023;73(3):720. doi:10.47391/JPMA.7035. PMID:36932796.
2. Morris HR, Spillantini MG, Sue CM, Williams-Gray CH. The pathogenesis of Parkinson's disease. Lancet. 2024;403(10423):293-304. doi:10.1016/S0140-6736(23)01478-2. PMID:38245249.
3. Kuhlman GD, Flanigan JL, Sperling SA, Barrett MJ. Predictors of health-related quality of life in Parkinson's disease. Parkinsonism Relat Disord. 2019;65:86-90. doi:10.1016/j.parkreldis.2019.05.009. PMID:31118162.
4. Najafi F, Mansournia MA, Abdollahpour I, Rohani M, Vahid F, Nedjat S. Association between socioeconomic status and Parkinson's disease: findings from a large incident case-control study. BMJ Neurol Open. 2023;5(1):e000386.

doi:10.1136/bmjno-2022-000386. PMID:36817512; PMCID:PMC9933671.
5. Armstrong MJ, Okun MS. Diagnosis and treatment of Parkinson disease: A review. JAMA. 2020;323(6):548-60. doi:10.1001/jama.2019.22360. PMID:32044947.
6. Cassidy I, Doody O, Richardson M, Meskell P. Quality of life and living with Parkinson's disease: a qualitative exploration within an Irish context. BMC Neurol. 2024;24(1):275. doi:10.1186/s12883-024-03769-y. PMID:39118093; PMCID:PMC11308529.
7. Henry RS, Lageman SK, Perrin PB. The relationship between Parkinson's disease symptoms and caregiver quality of life. Rehabil Psychol. 2020;65(2):137-44. doi:10.1037/rep0000313. PMID:32068420; PMCID:PMC7195231.
8. Teoli D, Bhardwaj A. Quality of life. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025. [Last access date: 27 Mar 2023]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK536962/
9. Kaplan RM, Hays RD. Health-related quality of life measurement in public health. Annu Rev Public Health. 2022;43:355-73. doi:10.1146/annurev-publhealth-052120-012811 PMID:34882431.
10. Word Health Organization. Essential medicines and pharmaceutical policies; 2025. Available from: https://www.emro.who.int/essential-medicines/strategy-access/
11. Khan MSA, Ahmad I. New look to phytomedicine. Academic press; Chapter 1, Herbal medicine: Current trends and future prospects. 2019. p. 3-13. doi:10.1016/B978-0-12-814619-4.00001-X.
12. Nissen M. Factors responsible for increased use of herbal medicines and self-medication. Adv Pharmacoepid Drug Saf. 2022;11(3):1000272.
13. Khan SS, Ikram R, Naeem S, Khatoon H, Anser H, Sikander B. Effect of M. chamomilla L. tea on chlorpromazine induced catalepsy: A neuroprotective study. Pak J Pharm Sci. 2020;33(5):1945-53. PMID:33824100.
14. Sah A, Naseef PP, Kuruniyan MS, Jain GK, Zakir F, Aggarwal G. A comprehensive study of therapeutic applications of chamomile. Pharmaceuticals (Basel). 2022;15(10):1284. doi:10.3390/ph15101284. PMID:36297396; PMCID:PMC9611340.
15. Araújo PC, Ramos CC, de Oliveira DB. Investigation into the sleep-promoting effects of the traditional use of passionflower (Passiflora spp.), chamomile (Matricaria chamomilla L.) and Mulungu (Erythrina spp.) in Brazil. Drugs Drug Candidates. 2025;4(1):11. doi:10.3390/ddc4010011
16. Adib-Hajbaghery M, Mousavi SN. The effects of chamomile extract on sleep quality among elderly people: A clinical trial. Complement Ther Med. 2017;35:109-14. doi:10.1016/j.ctim.2017.09.010. PMID:29154054.
17. Saadatmand S, Zohroudi F, Tangestani H. The effect of oral chamomile on anxiety: A systematic review of clinical trials. Clin Nutr Res. 2024;13(2):139-47. doi:10.7762/cnr.2024.13.2.139. PMID:38784853; PMCID:PMC11109927.
18. Zhao W, Cui H, Liu J, Sun H, Zhang Z, Zhang Z, et al. Herbal interventions in Parkinson's disease: A systematic review of preclinical studies. Cell Mol Neurobiol. 2025;45(1):50. doi:10.1007/s10571-025-01556-y
19. NCCIH. Chamomile; 2020. Available from: https://www.nccih.nih.gov/health/chamomile
20. Ostovar M, Rezaee Z, Najibi SM, Hashempur MH. Chamomile: A systematic review of adverse events. Complement Ther Med. 2025;91:103192. doi:10.1016/j.ctim.2025.103192. PMID:40374153.
21. Rafii F, Ameri F, Haghani H, Ghobadi A. The effect of aromatherapy massage with lavender and chamomile oil on anxiety and sleep quality of patients with burns. Burns. 2020; 46(1):164-71. doi:10.1016/j.burns.2019.02.017. PMID:31859096.
22. Kramer DJ, Johnson AA. Apigenin: a natural molecule at the intersection of sleep and aging. Front Nutr. 2024;11:1359176. doi:10.3389/fnut.2024.1359176. PMID:38476603; PMCID:PMC10929570.
23. Mohammadkhanizadeh A, Sheibani M, Taherkhani S, Nourabadi D, Mohamadi-Zarch SM, Nikbakht F, et al. Protective effects of apigenin in neurodegeneration: An update on the potential mechanisms. Brain Disorders. 2025;17:100189. doi:10.1016/j.dscb.2025.100189.
24. Javed H, Meeran MFN, Azimullah S, Bader Eddin L, Dwivedi VD, Jha NK, et al. α-Bisabolol, a dietary bioactive phytochemical attenuates dopaminergic neurodegeneration through modulation of oxidative stress, neuroinflammation and apoptosis in Rotenone-induced Rat Model of Parkinson's disease. Biomolecules. 2020;10(10):1421. doi:10.3390/biom10101421. PMID:33049992; PMCID:PMC7599960.
25. Marinus J, Visser M, Stiggelbout AM, Rabey JM, Martínez-Martín P, Bonuccelli U, et al. A short scale for the assessment of motor impairments and disabilities in Parkinson's disease: the SPES/SCOPA. J Neurol Neurosurg Psychiatry. 2004;75(3):388-95. doi:10.1136/jnnp.2003.017509. PMID:14966153; PMCID:PMC1738938.
26. Ruotolo I, Sellitto G, Berardi A, Simeon R, Panuccio F, Amadio E, et al. Psychometric properties of the Parkinson's disease Questionnaire-39 and its short form Parkinson's disease Questionnaire-8: A systematic review and meta-analysis. J Clin Neurosci. 2024;123:100-17. doi:10.1016/j.jocn.2024.03.032. PMID:38564966.
27. Dehghan A, Ghaem H, Borhani-Haghighi A, Safari-Faramani R, Moosazadeh M, Gholami A. Evaluation of reliability and validity of PDQ-39: Questionnaire in Iranian patients with Parkinson's disease. Zahedan J Res Med Sci. 2016;18(3):e6245. doi:10.17795/zjrms-6245.
28. Huneke NTM, Amin J, Baldwin DS, Bellato A, Brandt V, Chamberlain SR, et al. Placebo effects in randomized trials of pharmacological and neurostimulation interventions for mental disorders: An umbrella review. Mol Psychiatry. 2024;29(12): 3915-25. doi:10.1038/s41380-024-02638-x. PMID:38914807; PMCID:PMC11609099.
29. Shen Zh, Xu Q, Jin L. Structured procedures promote placebo effects. J Experiment SocPsychol. 2020;91(104029). doi:10.1016/j.jesp.2020.104029.
30. Bräscher AK, Ferti IE, Witthöft M. Open-label placebo effects on psychological and physical well-being: A conceptual replication study. Clin Psychol Eur. 2022;4(4):e7679. doi:10.32872/cpe.7679. PMID:36762351; PMCID:PMC9881123.
31. Knezevic NN, Sič A, Worobey S, Knezevic E. Justice for placebo:

Placebo effect in clinical trials and everyday practice. Medicines. 2025;12(1):5. doi:10.3390/medicines12010005.
32. Alami Rostami S, Rafieirad M. Investigating effect of chamomile hydroalcoholic extract on movement disorders in the animal model of Parkinson's disease. J Herb Drugs. 2016;7(1):37-43.
33. Amsterdam JD, Shults J, Soeller I, Mao JJ, Rockwell K, Newberg AB. Chamomile (Matricaria recutita) may provide antidepressant activity in anxious, depressed humans: an exploratory study. Altern Ther Health Med. 2012;18(5):44-9. PMID:22894890; PMCID:PMC3600408.
34. Tennigkeit J, Feige T, Haak M, Hellqvist C, Seven ÜS, Kalbe E, et al. Structured care and self-management education for persons with Parkinson's disease: Why the first does not go without the second-systematic review, experiences and implementation concepts from Sweden and Germany. J Clin Med. 2020; 9(9): 2787. doi:10.3390/jcm9092787. PMID:32872258; PMCID:PMC7563525.
35. Chaves PFP, Hocayen PAS, Dallazen JL, de Paula Werner MF, Iacomini M, Andreatini R, et al. Chamomile tea: Source of a glucuronoxylan with antinociceptive, sedative and anxiolytic-like effects. Int J Biol Macromol. 2020;164:1675-82. doi:10.1016/j.ijbiomac.2020.08.039. PMID:32795578.
36. Lidstone SC. Great expectations: the placebo effect in Parkinson's disease. Handb Exp Pharmacol. 2014;225:139-47. doi:10.1007/978-3-662-44519-8_8. PMID:25304530.
37. El Mihyaoui A, Esteves da Silva JCG, Charfi S, Candela Castillo ME, Lamarti A, Arnao MB. Chamomile (Matricaria chamomilla L.): A review of ethnomedicinal use, phytochemistry and pharmacological uses. Life (Basel). 2022;12(4):479. doi:10.3390/life12040479. PMID:35454969; PMCID:PMC9032859.
Wolff A, Schumacher NU, Pürner D, Machetanz G, Demleitner AF, Feneberg E, et al. Parkinson's disease therapy: what lies ahead? J Neural Transm (Vienna). 2023;130(6):793-820. doi:10.1007/s00702-023-02641-6. PMID:37147404; PMCID:PMC10199869.
39. McFarthing K, Buff S, Rafaloff G, Dominey T, Wyse RK, Stott SRW. Parkinson's disease drug therapies in the clinical trial pipeline: 2020. J Parkinsons Dis. 2020;10(3):757-74. doi:10.3233/JPD-202128. PMID:32741777; PMCID:PMC7458531.
40. Siddiqui RA. It's time to foster pride and let go of prejudice. Disability pride month: Why Pakistan needs it? J Pak Med Assoc. 2023;73(5):1170. doi:10.47391/JPMA.7955.
41. Milane T, Hansen C, Correno MB, Chardon M, Barbieri FA, Bianchini E, et al. Comparison of sleep characteristics between Parkinson's disease with and without freezing of gait: A systematic review. Sleep Med. 2024;114:24-41. doi:10.1016/j.sleep.2023.11.021. PMID:38150950.
42. Dai YL, Li Y, Wang Q, Niu FJ, Li KW, Wang YY, et al. Chamomile: A review of its traditional uses, chemical constituents, pharmacological activities and quality control studies. Molecules. 2022;28(1):133. doi:10.3390/molecules28010133. PMID:36615326; PMCID:PMC9822300.
43. Amara AW, Chahine LM, Videnovic A. Treatment of sleep dysfunction in Parkinson's disease. Curr Treat Options Neurol. 2017;19(7):26. doi:10.1007/s11940-017-0461-6. PMID:28567500; PMCID:PMC6371969.

How to Cite this Article:
Masoud SA, Adib-Hajbaghery M, Dadkhah-Tehrani M, Hakimzade Z. The effect of chamomile extract on motor function and quality of life in persons with Parkinson's disease: A randomized placebo-controlled trial. Nurs Midwifery Stud. 2025;14(4):265-274. doi:10.48307/nms.2025.503215.1558