Inhale, Exhale: The Therapeutic Effect of Yoga on Physiological and Psychological Symptoms in Patients with Parkinson's Disease

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ABSTRACT

Background: Parkinson's disease (PD) has a high prevalence in Canada, thus research on this neurodegenerative condition is essential to further our knowledge on the etiopathogenesis of this condition. PD is characterized by a loss of dopamine in the cells. This neurotransmitter functions by sending signals from the brain to the muscles to control movements. As a result of the lack of dopamine, there are several symptoms including tremors, bradykinesia, rigidity. Currently, dopaminergic therapy is the standard for managing the physical motor symptoms associated with PD. This therapy does not address the psychological or quality of life of a patient with the disease. Yoga practice has been shown to improve fatigue, stress, depression and well-being in patients with chronic illnesses. Recent research suggests that yoga can improve physiological and psychological symptoms in PD. **Objectives:** The aim of this structured literature review is to determine whether the literature indicates that yoga has a positive therapeutic benefit in physiological and psychological symptoms among patients diagnosed with Parkinson's disease. **Methods:** We performed a comprehensive search in the PubMed and Web of science electronic databases and searched the references from the articles found to review relevant articles in English, French and Portuguese, using keywords "yoga" and "Parkinson's" and "quality of life". Inclusion and exclusion criteria of the articles were predetermined and reviewed. **Results:** A total of 126 articles published from 2000 to 2017 were available. Of 126 articles, 7 articles were included in this review. Based on the available literature, yoga could be considered as an effective adjuvant for the patients with PD. **Conclusion:**The existing evidence supports that the practice of yoga has shown to be effective in improving various physiological and psychological symptoms in PD. Limited literature is available on the topic therefore further research needs to be completed.

INTRODUCTION

What is Parkinson's disease?

•Common progressive neurodegenerative disease that affects 0.5-1% of older adults aged 65-69 years old and increases with age[1]
•The symptoms arise due to a loss of dopamine in the brain and symptoms may include tremors, bradykinesia and rigidity [2]
•The majority of the negative effects are related to motor function[1]

What is yoga?

•Philosophy and a practical science that includes a variety of mind–body-affecting practices including: breathing, physical postures, movement sequences, relaxation[3]
•It can improve endurance, flexibility, strength and balance[1]
•The practice of yoga affects the central and peripheral nervous system[1]

Why is it important?

•Second most common age-related neurodegenerative disorder after Alzheimer's disease with a prevalence of 7-10 million worldwide[4]
•Traditional Parkinson's disease treatments do not address the psychological or quality of life of patients[1]
•Yoga can reduce the risk of falling and improves the overall quality of life in healthy individuals[1]

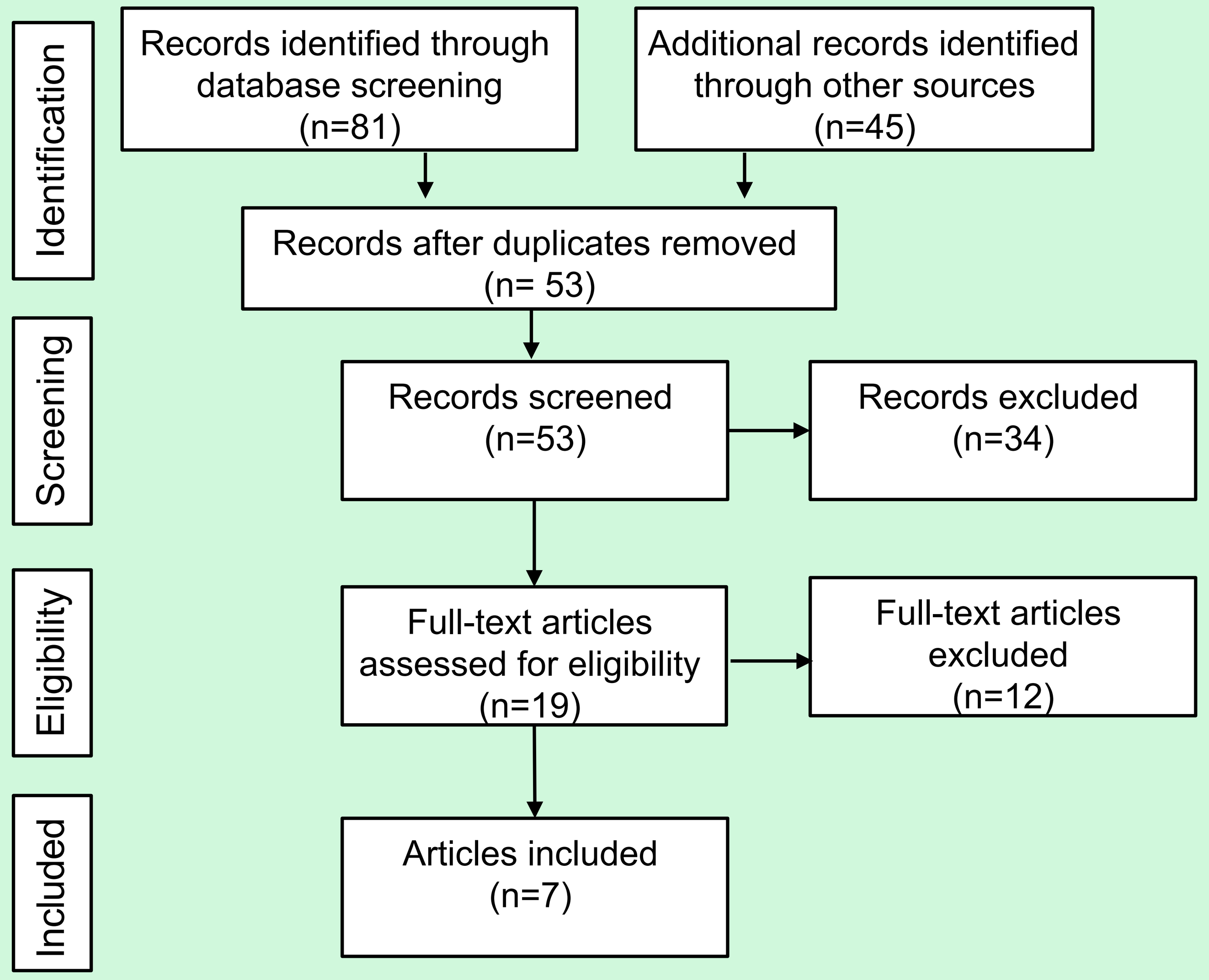
OBJECTIVE

This structured literature review investigated the association between yoga and the physiological and psychological symptoms in Parkinson patients. These findings may be used to help with management of symptoms during the course of PD and also suggest alternatives to conventional pharmaceutical interventions.

RESEARCH QUESTION

Does a therapeutic yoga intervention help alleviate physiological and psychological symptoms in patients with Parkinson's disease?

METHODS



Inclusion criteria

•Keywords: Yoga, Parkinson's, Quality of Life
•Full Text Articles
•Types of yoga: Hatha, Vinyasa, Power, Viniyoga or Iyengar
•Peer reviewed
•English, French or Portuguese only
•Publication date: 2000-2017
•Diagnostic Criteria of PD by Hoehn and Yahr: I-IV

Exclusion criteria

•Single case study
•Meditation, Tai Chi, Dance
•Laughter Yoga
•Conference posters
•Articles that repeat principal findings of main experiments
•Study protocols

Agreement between raters

•Three independent raters evaluated the articles based on the inclusion criteria and Cohen's kappa: κ= 1.00

RESULTS

Table 1. Summary of purpose, results and limitations of selected articles

Study	Study Type	Sample Size	Purpose	Results	Limitations	Association
Bega et al. (2016)[5]	RCT (Pilot Study)	17	• To assess the feasibility and safety of a gentle Iyengar yoga intervention compared to traditional resistance training in patients with mild to moderate severity PD.	• Improvement in Unified Parkinson's Disease Rating Scale (UPDRS) motor function and quality of life • Preventative role on anxiety, emotional and behavioral dyscontrol	• Small sample size • Control group comprised of elderly individuals and not individuals diagnosed with PD	Yes
Ni et al. (2016)[1]	Secondary Analysis of RCT	27	• Examine the effects of a high-speed power Vinyasa yoga program on bradykinesia, muscle function and quality of life in older persons with mild to moderate PD	• Reduced limb bradykinesia and rigidity score • Increased muscular strength and power • Improved quality of life	• Small sample size • Not tester blind • Short training duration	Yes
Ni et al. (2016)[6]	RCT	41	• To compare the effectiveness of high-speed Vinyasa yoga and power training (PWT) as interventions for addressing motor symptoms, balance, mobility, and muscle performance in older patients with mild to moderate PD	• Alleviate motor symptoms • Improve balance function and gait • Improvement in Functional Reach Test (FRT) and Single Leg Stance (SLS) but not significant • Increase leg muscle strength and power	• Not tester blind • Small sample size • Variability in disease states	Yes
Ni, M. (2015)[7]	RCT	41	• Compared power training (PWT) and Vinyasa yoga as separate exercise interventions for older adults with PD. • Assess the comparative effectiveness of these interventions and their impact on strength, power, motor function, gait, posture, balance and perceived quality of life in a sample of patients with mild to moderate PD.	• Significant improvements in motor examination and balance • Participants' self-report on the quality of life (Parkinson's Disease Questionnaire-39) suggested improved mobility and reduced fear of falling • Improvement in SLS	• Small sample size • Not tester blind • Anti-Parkinsonism medication may have had an impact on the performance in physical functioning test	Yes*
Sharma et al. (2015)[8]	RCT (Pilot Study)	13	• To discern if physiological and QOL-related benefits of Iyengar-based Hatha yoga exist in individuals with PD	• Motor symptom scores were significantly improved • Improvement in physiological and non-motor factors • Significant improvement in diastolic blood pressure • Falling episodes had declined by 25%	• Small sample size • Coin toss randomization method • No control for confounding variables like comorbidities	Yes*
Boulgarides et al. (2014)[9]	Repeated measures design (Pilot Study)	10	• Determine which nine outcome variables that measure strength, flexibility, motor control, balance, function, anxiety and depression would be most responsive to an eight-week adaptive Hatha yoga program for individuals with PD	• Near significant improvement in lower extremity functional strength and flexibility, • Near-significant improvement in motor control and depression • Single Leg Stance (SLS) approached significance • Little improvement in Functional Reach Test (FRT) • No improvement in Berg Balance Scale (BBS) but most likely due to a ceiling effect	• Small sample size • Study design • Sample bias	Yes
Colgrove et al. (2012)[10]	RCT (Pilot Study)	13	• To assess feasibility for the use of Iyengar-based Hatha yoga in people with PD, and to gather preliminary data on the effects of yoga on functional measures of motor performance on the UPDRS and Berge Balance Scale	• Significant improvement in balance and overall motor function • General trend of positive outcomes in the yoga group for strength, range of motion and flexibility in selected hip and ankle measurements	• Small sample size	Yes*

*Studies with statistically significant results

DISCUSSION

Key findings

- All studies evaluated found a positive therapeutic benefit of yoga in helping with the management of physiological and psychological symptoms in patients with PD.
- All studies found an improvement in the Motor Examination Scale in UPDRS.
- 5 studies established an improvement in balance
- 4 studies found a positive association in psychological symptoms, such as decreasing depression and including anxiety following the yoga intervention
- Boulgarides et al. (2014) found no improvement in balance using the Berg Balance Scale but explains it could be due to a ceiling effect
- 2 articles found little improvement in Functional Reach Test (FRT) but was not statistically significant
- 2 articles found an improvement in Single Leg Stance (SLS) but was not statistically significant
- Results show promising outcomes for future Parkinson disease research and studies

Limitations

•We excluded case studies
•Use of two databases: Pubmed and Web of Science
•We limited our search to free and easily accessible articles
•Publication bias since we did not include grey literature
•Since the topic is new, we included pilot studies

Implications for future research

•Larger scale studies
•Longer observational period
•Increase studies conducted at the same time of day and in community centres

Policy implications

•Clinically, it could be used as complementary to anti-Parkinsonian drugs.
•Recognition of yoga in a clinical practice may help diversify and increase specialized yoga classes for PD patients in the communities.

CONCLUSION

This structured literature review examined the effect of a yoga intervention program on the physiological and psychological symptoms in patients with PD. As shown in this review, there was a strong consensus between articles that yoga can contribute to an improvement in motor skills, balance and quality of life in PD patients. Based on these findings, yoga could be used as a complementary treatment method. Nevertheless, further research is necessary to validate and generalize the results of using yoga as a therapy for Parkinson's disease.

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