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| RESEARCH ARTICLE

Effect of Yoga Therapy on Kinesiophobia, Physical Function and Fall Prevention in Parkinson's Disease

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| ABSTRACT
Parkinson's disease (PD) is a progressive neurodegenerative disorder caused due to deficiency of "dopamine" neurotransmitter in the substantia nigra part of the brain. The prevalence of Parkinson.s disease increases with advancing age both for men and women. PD is characterized by clinical symptoms like bradykinesia, postural instability, rigidity in the muscles, resting tremors, increased risk of falls, etc. "Kinesiophobia", in simple terms is the irrational, debilitating fear of movement due to the anticipation of pain or injury, and is prevalent in individuals with PD. Kinesiophobia further exacerbates functional limitations and fall risk. Yoga therapy, integrating physical postures, mindfulness, and controlled breathing, offers a comprehensive approach to mitigating kinesiophobia while improving physical function and reducing fall rates. This article reviews the evidence supporting yoga therapy as a therapeutic intervention for individuals with PD, highlighting its impact on kinesiophobia, balance, and mobility.

| KEYWORDS
Parkinson.s disease, Kinesiophobia, Physical function, Fall prevention

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1. Introduction

Parkinson's disease is a neurological condition which is progressive in nature. [1] The main changes arise from brain dysfunction as a result of reduced production of chemical messengers particularly the neurotransmitter "dopamine".[1] There is an increasing prevalence noted for both the genders men and women with advancing ages. [2] A person with Parkinson's disease presents with motor as well as non-motor symptoms. The classic triad of motor symptoms is resting tremors, bradykinesia, rigidity.[3] Some secondary motor symptoms include dysarthria, dysphagia, microphagia, shuffling gait, festination, freezing, and dystonia.[4] Along with these motor symptoms some can be noted like autonomic dysfunction, cognitive/neurobehavioral abnormalities, sleep disorders and sensory abnormalities such as anosmia, paresthesias and pain. [5] Parkinson's disease, was noted to be the fastest growing neurological disorders, which are now the leading source of disability globally. [6] The most important risk factor is age, but the risk of Parkinson's disease also appears to be associated with industrial chemicals and pollutants, such as pesticides solvents, and metals.[6] So, with advancing ages and growing industrialization there is a great rise noted in the prevalence of the disease worldwide.

Falls are a debilitating and costly problem for people with PD as they are likely to fall twice as more as compared to people with other neurological conditions. [7] There are several risk factors known to be associated with falls in people with PD. These include postural instability, freezing of gait, leg muscle weakness, and cognitive impairment. [8]

Kinesiophobia is a term that means irrational, debilitating fear of movement and activity from the belief of fragility and increased susceptibility to injury. [9] The phenomenon of kinesiophobia cannot be fully explained as simple fear of pain but it may well appear as a fear of physiological symptoms of fatigue or exhaustion or, even as fear of physical or mental discomfort. [10] In case of kinesiophobia, they are different defence mechanisms that may appear, such as: repression negation, simulation and projection or, most frequently used, rationalisation. Kinesiophobia is linked with impaired physical performance, and an increased self-reported disability, that may predict future occupational disability. [11]

2. Understanding Kinesiophobia in Parkinson's Disease

Kinesiophobia, is often underdiagnosed in PD and can be an obstacle to physical and motor activity in patients and can impact their independence in carrying out daily activities. [12] In Parkinson's disease due to the muscle weakness, postural instability, balance impairment and rigidity a person experiences fall that in turn set in a fear. This fear further leads to reduced mobility that further increases the weakness, balance impairment and rigidity. Fear of falling and movement-related anxiety limit participation in physical activities crucial for maintaining muscle strength, balance, and coordination. [13] Over time, this avoidance behavior leads to deconditioning, greater dependence, and higher fall risk.

3. Yoga Therapy

"Yoga" is a Sanskrit word which means "union" or "yoking" which in simple terms can be stated that yoga is the union between mind and human body, heart and actions. [14] Yoga therapy is a holistic approach that blends the principles and practices of yoga with therapeutic techniques. Yoga therapy is emerging as one of the important components in today's medical world for its primary role to promote physical, emotional, and mental well-being. A traditional yoga encompasses blend of physical postures (asanas), breathing techniques (pranayama) and meditation (dhyana). [15] The general benefits of the Yoga therapy are maintaining a physical and mental equilibrium, enhancing emotional health, induces calmness, with specific postures have a positive impact of the physiology of the body thus improving strength, flexibility. [16] Physical Postures (Asanas): Gentle, progressive movements improve strength, flexibility, and balance. Breathing Techniques (Pranayama): Controlled breathing reduces anxiety and enhances body awareness. Meditation (Dhyana): Promotes mental focus and reduces fear of movement.

4. Benefits of Yoga therapy:

Yoga is proved to have a vital impact of physical as well as mental wellbeing of the person. Physical benefits include improving the flexibility, muscle strength, joint mobility, endurance, balance and eventually reducing the fall rates. On the other hand it helps reduce the anxiety, depression, fear of the falls, induces calmness, self-compassion and boosts the self-esteem of the patient. [17]

5. Effect of Yoga Therapy for Parkinson's disease:

Improved Flexibility and muscle strength

Yoga includes maintaining postures that enhance joint mobility and muscle tone, effectively countering the rigidity and stiffness commonly associated with Parkinson's disease. Through gentle stretches, it reduces muscle tightness and improves the range of motion in the joints thus promoting greater flexibility and ease of movement.

Enhance Balance and stability

Yoga emphasizes slow, deliberate transitions between poses, encouraging better awareness of posture and alignment. It plays a role in enhancing proprioception, strengthening core and stabilizing muscles, and promoting neuromuscular coordination thus improving the balance and stability in a patient which helps reducing the fall risk.

Better Posture and Alignment

Parkinson's often leads to a stooped posture with increased thoracic kyphosis, rounded shoulders, forward neck posture. Yoga with a certain way of maintaining proper postures and breathing techniques help promote spinal extension and alignment by strengthening postural muscles that alleviates discomfort.

Reduction in Tremors and Unwanted Movements

Stress and anxiety are common trigger factors for tremors in the Parkinson's patients. The slow, deliberate movements in yoga encourage greater control over muscle activity, fostering improved neuromuscular coordination. Additionally, restorative poses

and deep relaxation practices help soothe the body and mind, decreasing involuntary muscle activity and creating a sense of steadiness and calm.

Improved Gait and Movement Fluidity

Yoga's slow, controlled movements and dynamic flows promote neuromuscular coordination, which is essential for addressing freezing of gait and other motor impairments. By enhancing the mind-body connection, yoga encourages smoother, more deliberate movements, making transitions more intentional and fluid.

Support for Mental Clarity

Yoga improves mental health in Parkinson's disease by reducing stress, anxiety, and depression, which are common in individuals with the condition. Mindfulness practices, meditation, and controlled breathing techniques (pranayama) help calm the nervous system, lower cortisol levels, and promote emotional resilience. Yoga also enhances the release of endorphins, contributing to a more positive mood. By fostering mental focus and clarity, yoga can improve cognitive function and support individuals in coping with the psychological challenges associated with Parkinson's.

6. Conclusion

Yoga therapy offers a holistic approach to addressing kinesiophobia, improving physical function, and reducing fall risk in individuals with Parkinson's disease. By combining mindful movements, balance training, and relaxation techniques, yoga enhances confidence in movement, alleviating the fear of falling. It strengthens key muscle groups, improves flexibility, and promotes better neuromuscular coordination, contributing to smoother and more controlled movements. Additionally, yoga's focus on balance and postural alignment directly reduces the likelihood of falls, while its mental health benefits foster a greater sense of well-being. Overall, yoga therapy is a valuable complementary practice in managing Parkinson's and enhancing quality of life. With its holistic benefits, yoga therapy has the potential to transform the management of PD, empowering individuals to lead safer and more active lives.

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