

A THAI DANCE EXERCISE REGIMEN FOR PEOPLE WITH PARKINSON'S DISEASE

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ABSTRACT: Parkinson's disease (PD) is a chronic, progressive, neurodegenerative disorder that causes disability and often has a negative impact on the patient's quality of life. The objectives of this study were to assess the feasibility and acceptability of a Thai dance exercise regimen for people with Parkinson's disease and to determine its impact on the functional mobility and quality of life of the participants. A series of 36 Thai dance sessions, each lasting 60 minutes, was designed for the study. Basic movements (mae tha) of Thai classical dance were specifically selected to meet the therapeutic needs of people with Parkinson's disease whose movements were impaired by the disease. Twenty-five people with PD volunteered to attend the Thai dance exercise program 3 times a week for 12 weeks. Functional mobility and quality of life were assessed before and after the 12-week regimen by administering the Unified Parkinson's disease Rating Scale (UPDRS) subscales 2 and 3, Timed Up and Go Test (TUG), and the 8-item Parkinson's disease questionnaire (PDQ8). The results indicated that there were significant improvements in all of the functional mobility and quality of life indicators as calculated by the paired t-test. Feedback from the participants indicated that they enjoyed the Thai dance exercises and perceived improvements in posture, performance of daily living activities and self confidence as well as decreased depression. When practiced regularly, Thai dance can lead to improvements in motor functions and quality of life of the participants. Furthermore, dance-based exercise is reported to be enjoyable and may be performed alone or in a group without any special equipment.

Keywords: Functional mobility, Parkinson's disease, Quality of life, Thai classical dance, Thai dance exercise regimen

INTRODUCTION

There are approximately 5 million people with Parkinson's disease (PD) throughout the world [1] and there are 60,565 registered people with PD in Thailand [2]. PD is a chronic, progressive, neurodegenerative disorder that causes disability and generally has a negative impact on the quality of life [3]. The prevalence of PD increases with age, affecting approximately 1% of the population over the age of 65 years and 2% of the population over 80 years of age [4]. The four main motor symptoms of PD are resting tremor, bradykinesia, rigidity, and postural instability [5]. Medical management may reduce rigidity and bradykinesia but does not directly address other physical effects of PD such as range of motion, strength and endurance nor the progression of the disorder. Optimal therapy requires both pharmacologic treatment (usually dopamine replacement therapy) and regular physical activity [6].

Regular exercise must be included in an active lifestyle and continue throughout the life of people with PD for the best outcomes [7]. Exercise

regimens should emphasize safe and functional movements and ideally include strength, flexibility, endurance, and balance activities [8].

Thai Classical Dance (natasin) is a living art and has been a vital part of the life of the Thai people for generations. Traditionally, there were 108 basic movements (mae tha) in Thai Classical Dance [9]. It is a cultural activity but it also can be a good method of exercise for people with PD because traditional forms of Thai Classical dance require whole body coordination with music, involving both upper and lower body movements and it involves many types of movements that are beneficial for them by promoting flexibility, strength, balance and coordination. In addition, traditional Thai music can be used as a rhythmic auditory cue [10]. Studies have not been done on Thai classical dance exercise in the PD literature. Therefore, the objective of this study was to explore the feasibility, acceptability and impact of a Thai dance exercise regimen specifically designed for people with PD on their functional performance and quality of life.

MATERIALS AND METHODS

Part 1: The development of a Thai dance exercise regimen for people with PD (Table 1).

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Table 1 The Thai dance exercise regimen

Sessions	Components of training	Actions
1	Breathing exercise	Participants sit on chairs with eyes closed, taking deep breaths.
	Warm up	Both hands perform “chip and wong” with movements up and down in eight level, then “ram sai” is performed.
	Stretching exercise	Modified basic movements of Thai dance are performed.
2-6	Basic movements of upper extremity	“sod soi mala”, chang prasan nga”, “ram sai”, “prom si na nok yoong fon hang”, and “lor kweaw” are performed.
7-12	Basic movements of lower extremity	Part 1: Weight shifting skill is practiced (forward-backward, side to side). Part 2: One hand is held on a chair and legs are lifted (front, back and lateral side) with legs are bent with the knees opening outward to make an angle with the hips and toes raising).
13-15	Walking pattern	4 point step forward and backward.
16-18	Step training	4 point step with leg lifting.
19-21	Balance training	“prom si na” with lift leg forward, “nok yoong fon hang” with lift leg backward, “pi sa mai reang morn” with lift leg outward 45 degree and “prom ni mit” with lift leg backward are performed.
22-25	Upper & lower limbs coordination (1)	“ram klong yao”, including movements of rotation of neck and trunk, supination and pronation of both arms, repetitive movements of upper extremities in “ram sai and tung wong soong” with walking forward, backward, side to side and turning is practiced. Dance is practiced in couples and set two rows for walking parade and tramping with rhythm.
26-36	Upper & lower limbs coordinating (2)	Basic movements of upper extremities with 4 point step, balance training and “ram klong yao” are performed.

The first step was to specifically select the basic movements (mae tha) to meet the impairments commonly experienced by people with PD, followed by designing 18 Thai dance sessions and choosing traditional Thai music for each session. The dance and music regimen was pretested with two PD patients who were recruited from the Outpatient Center of Excellence for Parkinson's disease and Related Disorders at Chulalongkorn Hospital in Bangkok, Thailand. The second step was to design 36 sessions which were tested for content validity by five experts: two neurologists who specialize in Parkinson's disease, one physical medicine and rehabilitation (PM&R) doctor, one expert in physical therapy in neurology, and one expert in Thai classical dance. The final step was to modify the Thai dance exercise regimen based on the recommendations of the experts.

Part 2: Assess the feasibility and acceptability of a Thai dance exercise regimen and its impact on functional performance and the quality of life of the participants.

Data were collected from a convenient sample of 25 outpatients with PD who visited the Center of Excellence for Parkinson's disease and Related Disorders at Chulalongkorn Hospital in Bangkok

between July 2010 and March 2011. Patients' disabilities were rated according to the Hoehn and Yahr Scale (H&Y) [11]. Inclusion criteria were H&Y stage 1-3, confirmed by a neurologist; outpatients with age greater than 18 years, ability to stand and walk with or without any assistive devices; ability to understand and follow the simple directions; and being on a stable drug regime. Exclusion criteria were indications of dementia, a history of neurological deficits other than PD and orthopedic problems affecting mobility. Informed consent was obtained from all patients prior to the study and the study was approved by the Ethics Committee of the Faculty of Medicine, Chulalongkorn University.

The duration of the intervention was 12 weeks, with 60 minute sessions three times per week, for a total of 36 sessions. Each session included five parts: 1) relaxation & breathing exercise (five minutes), 2) warm-up (five minutes), 3) Thai classical stretching (five minutes), 4) Thai classical dance (forty minutes) and 5) cool-down (five minutes).

Outcome measures

Each patient's demographic information, years since diagnosis, disability stage, weight, height and medications, were taken from the medical records

and patient interviews. All assessments were conducted in the “on” state, one hour after medications and one week prior to the initiation of training and one week following the completion of the 36 training sessions. During each assessment, participants were first assessed by using the Unified Parkinson’s disease Rating Scale (UPDRS) subscales two and three [12]. Then quality of life was assessed by using the eight-item Parkinson’s disease questionnaire (PDQ8) [13] as well as functional mobility was assessed by using the Timed Up and Go Test (TUG) [14]. Each participant also completed a feedback questionnaire after completion of the final dance lesson. The questions covered their perceptions of their physical and psychological status as a result of participating in this program.

Statistical analysis

The results were analyzed by using the Statistical Package for Social Sciences (SPSS) version 17.0 Software System for Windows. Demographic and descriptive statistical methods were used to describe patients. The paired t-test was used to compare the variables between baseline and post-intervention. All values presented were mean $\pm$ standard deviations (S.D.). A *P*-value of < 0.05 was considered to be the statistically significant level.

RESULTS

Twenty-one participants completed all thirty-six sessions. Four participants did not complete the program for the following reasons: one withdrew at week 2 because of injuries, one participant completed the program but was not available for the post-regimen evaluation, and the other two had transportation problems.

Table 2, the baseline characteristics and daily dosage of levodopa are shown. Table 3, after 12 weeks of training the Thai dance, UPDRS (II&III) score decreased by 3.33 ± 1.17 and 7.81 ± 4.68 respectively, from baseline. Time in TUG decreased by 4.16 ± 4.76 seconds, and PDQ8 decreased by 5.57 ± 2.99 . It was determined that there were significant changes of all functional mobility and quality of life indicators.

All 21 participants responded in the post-regimen questionnaire to questions about their perceptions of

both their physical and psychological status after the 36 sessions. The majority of participants noted that they really enjoyed the Thai dance and experienced improvements in self confidence, posture and performance in daily living activities as well as decreased depression.

DISCUSSION

The purpose of this study was to explore the feasibility, acceptability and impact of a Thai dance exercise regimen for people with PD. Thirty-six sessions were specifically designed and choreographed to address the impairment of people with PD in their functional mobility and quality of life. The content validity was confirmed by five experts in the following areas: basic movements, rhythm of music, duration, intensity, benefits and safety. The overall results indicated that there were significant improvements in the selected indicators after participating in the exercise regimen. In addition, feedback from the participant’s families indicated that all of them had better social interactions and appeared to be more happy than previously.

The Thai dance exercise regimen combines the uniqueness of Thai dance choreographies and traditional Thai music. Recent studies indicate that dance may be a beneficial and effective intervention for people with PD [15-18]. In addition, music is a rhythmic auditory cue to facilitate movement. Several studies noted that rhythmic auditory cues enhance walking performance in PD patients [19-22].

Table 2 Demographics of the Participants (n=21)

Parameters	PD participants Mean $\pm$ SD (range)
M/F ratio	10/11
Age (years)	64.1 $\pm$ 8.40 (48-80)
Height (cm)	160.38 $\pm$ 7.41(147-170)
Weight (kg)	56.71 $\pm$ 10.43 (41-75)
Body Mass Index (kg/m ²)	21.97 $\pm$ 3.26 (17.72-26.81)
Duration of disease (year)	6.76 $\pm$ 6.32 (1-22)
Hoehn and Yahr stage	2.26 $\pm$ 0.75 (1-3)
Daily dosage of levodopa (mg)	478.13 $\pm$ 116.86 (300-700)

Table 3 Comparisons of mean $\pm$ S.D of functional mobility and quality of life at baseline and post-test after 12 weeks (n=21 after test)

Parameters	Baseline (mean $\pm$ S.D.)	Post-test (mean $\pm$ S.D.)	<i>p</i> -value
Unified Parkinson’s disease Rating Scale II (UPDRS II)	9.33 $\pm$ 7.8	6.00 $\pm$ 6.63	0.000*
Unified Parkinson’s disease Rating Scale III (UPDRS III)	22.05 $\pm$ 13.86	14.24 $\pm$ 9.18	0.000*
Timed Up and Go Test (TUG)	14.54 $\pm$ 8.08	10.38 $\pm$ 3.32	0.001*
Eight-item Parkinson’s Disease Questionnaire (PDQ8)	10.33 $\pm$ 6.54	4.76 $\pm$ 3.55	0.000*

Comparison between baseline and post-test using paired t-test; * *p* < 0.05

The UPDRS score provides a detailed and accurate assessment of PD disabilities [23]. There were significant improvements in both UPDRS subscales (II&III) after participating in 36 sessions of Thai dance exercises. Changes of three to four points in UPDRS subscale II and eight points in UPDRS subscale III showed the effect of Thai dance that may be related to improved movement in the participants. It could be concluded that they were affected by characteristic movements and gestures in Thai classical dance such as “chip and lor kweaw” in relation to finger taps; hand movements, “chang prasan nga” and reciprocal movements in “ram gong yao” in relation to rapid alternating movement; and tramping with rhythm in traditional Thai music in relation to leg agility. In addition, rigidity could be decreased by stretched moving arm and rotating neck and trunk including performing of basic movements of upper extremities resulting in improving their score in UPDRS subscale III.

TUG is useful for measurement of mobility in people with mild to moderate PD [14] that incorporate walking, turning, standing up and sitting down. Bradykinesia or freezing of gait in PD patients may take prolonged time in this measurement. However, bradykinesia may be influenced by training [24].

Therefore, after being in the Thai dance exercise regimen the participants showed significant improvements of time by 4 seconds of TUG. Hackney et al. [18] reported significant improvements in TUG of about 1 second in PD patients who participated Tai Chi exercise in 20 lessons 1 hour long training sessions within 10-13 weeks. Similarly a study by Fuzhong Li et al. [25] showed a 1 minute decrease of TUG in PD patients who participated in Tai Chi exercise in 60-minute exercise sessions twice weekly for 24 weeks. In 2007, a preliminary study of the effects of Tango showed a trend toward improvements on TUG in PD patients who completed 21 hour progressive Tango sessions within 13 weeks [26]. Short duration, intensive Tango did not show significant improvements in the TUG in PD patients attending short duration of an intensive Argentina tango dance course, dancing 1.5 hour per day a week for 2 weeks [16].

Thai classical Dance specifically designed as an exercise regimen for elderly people may have a positive influence on quality of life [27-29]. This study found that the participants significantly improved on PDQ8 and the first observation from patients was their level of enjoyment of the sessions. A wife of one patient, who had suffered from PD for 22 years, said that her husband had not interacted with other people, and always isolated himself in the bedroom. However, after having participated in Thai dance classes, there were positive changes in emotional and behavioral

functions. Similarly, one study [30] demonstrated that Dance/Movement Therapy allowed patients to relate more to their environment, to communicate better and to reduce feeling of isolation. One patient who was about to lose his ability to play the saxophone could play it again after participating in the program for 6 weeks. One Lady in the Thai dance group explained to all patients whom she met that “Thai dance exercises every body part and her husband stopped complaining about his robot wife”. This study has some limitations. First, this is an open-label study so it is open to bias. Second, the scale may not be sensitive enough to quantify the different areas of improvement by Thai Dance. Third, not all patients have prior experience so some of participants may find Thai Dance more difficult than others. Finally, this study needs to conduct a larger-longer prospective randomized trial.

CONCLUSION

This was the first study of a Thai dance exercise regimen designed to be a therapeutic exercise technique for people with Parkinson’s disease. The results demonstrated the feasibility and acceptability of this regimen to people with PD. Moreover, it is a good alternative form of exercise and can lead to improvements in motor function and quality of life in people with PD. Furthermore, dance-based exercise approaches can make exercise more enjoyable and can be performed alone or in a group without any equipment.

ACKNOWLEDGEMENTS

The study was supported by The 90th Anniversary of Chulalongkorn University fund (Ratchadaphiseksomphot Endowment Fund), research unit (RU) grant number 52-026-30-005 of Chulalongkorn University and the Faculty of Sports Science, Chulalongkorn University. The authors thank Mr. Neil Brenden for his proof-reading of this manuscript. The authors are also thankful to the Center of Excellence for Parkinson’s Disease and Related Disorders, Chulalongkorn University as well as all Parkinson’s disease patients and the staff members for necessary assistance and instrumental support. There are no potential conflicts of interest involved in the study.

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