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Theoretical Concept of Impact of Tai Chi on Falls in Clients with Parkinson's Disease

Teoretyczna koncepcja wpływu Tai Chi na upadki wśród pacjentów z chorobą Parkinsona

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Abstract

Parkinson's disease (PD) is considered to be one of degenerative disorders of the central nervous system. According to the Parkinson's disease Foundation there is an estimated 60.000 Americans that are newly diagnosed each year with PD. Patients that have been diagnosed with Parkinson's disease encounter many side effects including freezing gait and poor balance. Freezing gait and poor balance were found to be correlated to an increased fall risk in patients with PD. Researchers are examining complementary and integrative therapies to lessen the symptoms and improve quality of life. Some studies indicate that Tai Chi (TC) could be utilized to lessen the symptoms of freezing gait and poor balance, decreased patient fall rate and increased patient general well-being. The main concept that will be presented within this paper includes Theoretical Concept of Impact of Tai Chi on Falls in Clients with Parkinson's Disease. **(JNNN 2018;7(3):130–133)**
Key Words: Parkinson's disease, falls, Tai Chi

Streszczenie

Choroba Parkinsona (PD) zaliczana jest do zaburzeń zwyrodnieniowych centralnego układu nerwowego. Według Fundacji, zajmującej się chorobą Parkinsona, szacuje się, że u 60 000 Amerykanów każdego roku zdiagnozuje się tą chorobę. Pacjenci, u których zdiagnozowano chorobę Parkinsona, borykają się między innymi z takimi problemami jak: nagłą blokadą ruchu podczas chodzenia czyli tzw. zamarzaniem (ang. freezing) i zaburzeniami równowagi. Stwierdzono, że freezing i zaburzenia równowagi są skorelowane ze zwiększonym ryzykiem upadku u pacjentów z PD. Badania naukowców koncentrują się na komplementarnych i integracyjnych terapiach, które mogłyby zmniejszyć objawy i poprawić jakość życia pacjentów. Niektóre badania wskazują, że Tai Chi (TC) może być wykorzystywany do zmniejszenia objawów freezing-u i zaburzeń równowagi, obniżenia wskaźnika upadków i poprawy ogólnego samopoczucia u pacjenta. Głównym celem prezentowanego artykułu, jest przedstawienie teoretycznej koncepcji wpływu Tai Chi na upadki u pacjentów z chorobą Parkinsona. **(PNN 2018;7(3):130–133)**
Słowa kluczowe: choroba Parkinsona, upadki, Tai Chi

Introduction

Parkinson Disease (PD) prevalence is on the rise. According to the Parkinson's disease Foundation there is an estimated 60 000 Americans that are newly diagnosed each year with PD [1]. Due to the chronic and progressive nature of PD and lack of cure to this deliberating disease researchers are examining complementary and integrative therapies to lessen the symptoms and improve quality of life. Some studies indicate that Tai Chi (TC) could be utilized to lessen the symptoms of freezing gait and poor balance, decreased patient fall rate and increased patient general well-being [2–4].

Wood, Bilclough, Bowron and Walker [5] proved that from 109 subjects 68.3% experienced a fall within the first year their study. Patients that have been diagnosed with Parkinson's disease (PD) encounter many side effects including freezing gait and poor balance. Freezing gait and poor balance were found to be correlated to an increased fall risk in patients with PD [2,6]. Tai Chi is a Chinese external form of martial arts with combined ideologies of physiology, psychology, and dynamics are applied to maintain physical and psychological balance to conserve a healthy life [7]. Tai Chi exercises are designed to allow the participant to control the movement of the canter of mass and encourages "conscious" repetitive, slow movement [8]. To measure the effectiveness on Tai Chi on fall reduction in a patient with PD a pre exercise and post exercise regimen prospective calendar-reported method of self-reported falls would be utilized. The prospective calendar-reported method of self-reported falls tool was provided by Mackenzie, Byles and D'Este [9] to be an effective tool to use to measure the amount of patient falls.

The main concept that will be presented within this paper includes Parkinson patient fall reduction due to systematic Tai Chi exercise use.

Review

Second Concept with Support Background Information

As mentioned earlier freezing gait and poor balance were found to be correlated to an increased fall risk in patients with PD [2,6]. Tai Chi exercises utilize physiology, psychology, and dynamics that are applied to maintain physical and psychological balance [7]. Is it possible that falls can be reduced by Tai Chi exercises due to its specific design that helps patients maintain the concepts of dynatomy in balance? Dynatomy is the study of dynamic human anatomy created by Dr. Whiting and Rugg. This study discusses the five factors that contribute to patient stability and mobility. When stability and mobility become compromised patients become more prone to [10]. To measure the effectiveness of Tai Chi exercise on the five factors that contribute to patient stability and mobility and help prevent falling the author suggests utilizing the kinematic system: an 11-segment whole-body model to measure the impact of Tai Chi exercise on the five factors of dynatomy. Krebs at el. [11] used the kinematic system to assess posture and balance in their study.

Relationship Between the Two Concepts

The author identified an associational relationship in theory presented variables. All of the variables that are associated with each other are based on the influence they have among each other. Tai Chi is associated by increasing of the exercise routines that can help decrease a patient's fall rate [2,6]. This, would be considered a negative or inverse relationship [12]. The second concept variable is associated with the first concept variable by decreasing the symptoms of PD such as freezing gait and poor balance by applying the concepts of dynatomy during Tai chi exercise and in turn decreasing the patient's fall rate [6]. This relationship would be considered a positive relationship [12]. This relationship is significant to study as fall reduction in patients with PD will have significant impact on a patient's quality of life [13].

Theory Development Strategies

An idea was created by the noticing of clinical encounters of patients being re-admitted to a facility due to frequent falls as well as hearing from the colleagues suggesting to one patient family Tai Chi as a form of exercise that may help in reducing patient falls. Then the hypothesis was created and the research of the possible explanation of this old phenomenon of Chinese form of martial arts as having an influence on patient fall rates was initiated. By implementing creative thinking and base knowledge the research was completed to support the creative hypothesis in an attempt to explain the phenomenon.

The author has experience working with patients with PD admitted to the facility due to a fall or reoccurring falls. The physical therapist and occupational therapist during the care meetings often alluded to the fact that there are limited exercises that could help to prevent a patient from falling. At one point the case manager presented an article about Tai Chi exercise that has a results showed promise with fall reduction in patients with PD. Author decided to acquire more information about Tai Chi as an exercise that reduces risk of falls. Literature search was conducted. As a first step of the search factors that influence falls in patients with PD were examine. The freezing gate and poor balance were found to be correlated to an increased fall risk in patients with PD [2,6]. Some studies have shown that certain exercises have no influence on fall reduction [14,15] and some studies have shown significance of reduction of falls [2,15]. It was also noted that studies that showed significant fall reduction concluded that research should include Tai Chi as a form of exercise for PD [3,16]. The Tai Chi as an exercise form of intervention was tested

to improve patient balance and showed positive correlation in both studies. Why would that be?

Secondly, the author begin to learn the exercise routine in hope to find more answers. The first class was rather strange, as no true exercise occurred to outside observer. The teacher started to explain the philosophy of external martial arts and of the essential theory that discussed the use of "mind intended" movement versus "strength intended" movement. More literature was purchase about Tai Chi to further explain the theory. According to Zhongwen and Swaim [8] one of the most important theories of Tai Chi includes the application or execution of the movement with only application of "mind intended" and not use of strength. During practicing Tai Chi, the participant should be relaxed and "open" to avoid application of muscle strength during the practice. The theory was that application of muscle strength during the exercise will cause the inability of the body to move and execute movements [8]. Is possible, that perhaps due to the body utilizing more "mind intended" movement such as Tai Chi, the PD patient is trained to utilize mindful or conscious movement so the poor balance can be improved to prevent falls? Or are the PD patient less fearful of falling due to exercising Tai Chi? What kind of mechanism makes the Tai Chi effective and helps prevents falls with patient with PD?

Description of Concept Development Strategy

During above concept discussion and background presentation a mixed method of concept synthesis was utilized. Qualitative and literature synthesis was utilized. A new concept was created by information found in literature and personal observation. The author indulged in reading of several sources including: clinical, conceptual and empirical. The concept was created by taking time during creative thinking. Thinking and ideas evolved and built upon collected data [17]. Then by clarification a connection a new concept emerged.

The literature search initially was conducted by examining six popular health science databases. Electronic databases included: PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, and Embase, from January 2000 to July 2018. The author reviewed abstracts carefully to establish a variety of high and low quality evidence-based material. Based on the research many studies were found documenting positive effects of Tai Chi on reduction of falls in patients with PD.

Literature search reviled that in patients with PD stability and mobility are compromised due to disease symptoms such as: stiffness (rigidity) and slow movement (bradykinesia), postural changes (freezing gait and stooped posture); impaired postural reflexes (postural instability or impaired balance and coordination); weight distribution problem while walking (centers of mass — CoM due to stooped posture) [18]. The above symptoms disrupt the flow of the five factors of dynatomy that help patients maintain their stability and mobility and causes them, to be prone to falls. Since Tai Chi as an exercise is proven to reduce falls this researcher postulate that Tai Chi must have positive influencing on the five factors of dynatomy. Figure. illustrates the concepts of five factors of dynatomy and how they may be correlated falls due to symptoms of PD.

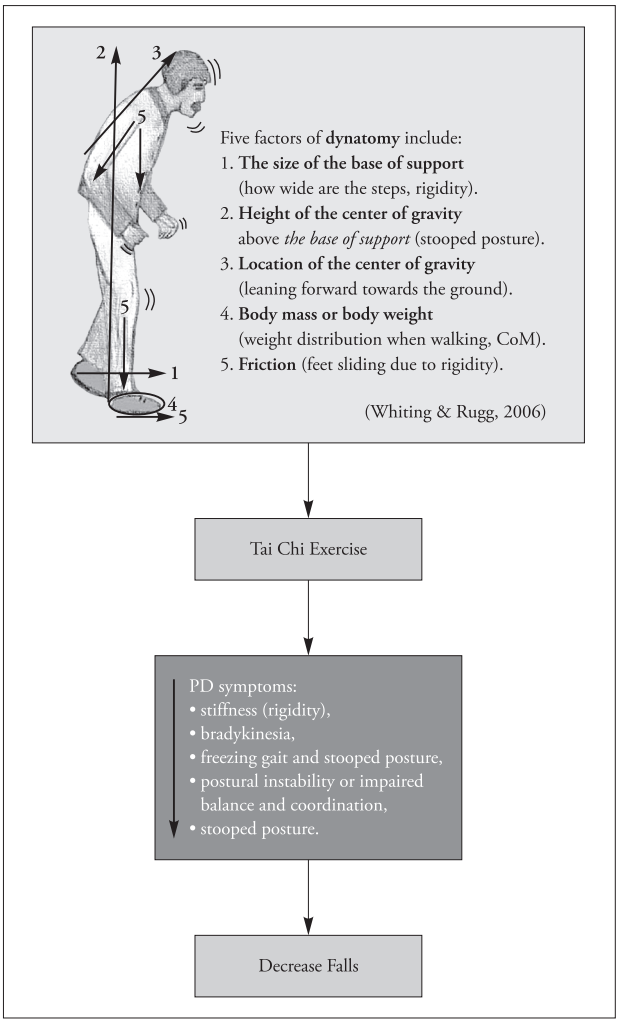

Figure. Cwiekala-Lewis Parkinson's Fall and Tai Chi Theoretical Framework

Conclusions

As patient population diagnosed with Parkinson Disease increases exponentially each year, symptoms managements by utilization of alternative treatment such as Tai Chi should be highly considered. Especially as current literature supports that Tai Chi decreases fall occurrence among persons with Parkinson's disease.

Further research is needed to test the proposed theoretical framework.

Implications for Nursing Practice

Parkinson's disease is a progressive neurodegenerative disease associated with cognitive, motor and emotional deficits. To a large extent it leads to the deterioration of the patients' current quality of life by progressive increase of deficits in self-care. Parkinson's disease along with the severity of symptoms slowly eliminates the patient from everyday life, is unable to perform any activities and becomes completely dependent on nursing and medical staff. As patient population diagnosed with Parkinson Disease increases exponentially each year, nurses should increase their knowledge about prevention such as, eg., Tai Chi. Especially as current literature supports that Tai Chi decreases fall occurrence among persons with Parkinson's disease.

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