63 - ANALYSIS OF PSYCHOMOTOR STRUCTURES TONICITY AND BALANCE OF FEMALE ELDERES THAT PRACTICE TAI CHI CHUAN

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Presentation

This research aimed to investigate tonicity and equilibration levels of elders who participated in a Tai Chi Chuan trainning program, over a time span of six months, between pre and post testing.

Tai Chi Chuan might seem as relaxation technique, neverthless, according to Despeux (1995), it is a self defense method, being treated as a martial art by the Chinese, which they call Wu Shu.

Tai chi chuan means Supreme Energy Combat. Wu Chao-Hsiang, grand master, doctor and commendator, was among the first people to bring it over to Brazil. According to Wu, J. (2000), right after settleing in Rio de Janeiro in 1972, the grand master Wu Chao-Hsiang began to teach Tai chi chuan and other traditional chinese arts. He became one of the main people to popularize it.

Wu, C. (1988) states that Tai Chi Chuan is a beneficial physical activity, appropriated for any age because of its natural, easy and gentle movements. It is supposed to develop people´s flexibility, teaching them how to defend themselves from a vigourous and violent attach with a minimum effort.

According to Etchepare, et. al (1999 apud MEIRELES, 2003), the aging process starts from conception throughout elderliness. Hence, it is a progressive and dinamic one. There are different changes (of morphological and functional, biochemical and psychologic natures) which establish an accelerating loss of our ability to adapt to the environment, resulting in more frequent pathological situations.

Fonseca (1998) defends that psychomotor “retrogenesis” seems to confirm a genetically programmed deterioration from cortex to bone marrow, from frontal lobe to cerebral trunk, from the most complex to the simplest structure, from the most programed to the most automatic reflex, from the microcospic to the most global perspective, making us reach the conclusion that it is a disintegration of the structural hierarchy. Therefore, a descending structural disorganization. However, psychomotor retrogenesis occurs differently in children´s development. The psychomotor structures are the following: tonicity, equilibration (balance), “lateralization”, body notion, space-time structuralizing, global and fine praxis. The child evolves from tonicity to fine praxis. The elder does the opposite way, from fine praxis to tonicity.

According to Fonseca (1995), tonicity includes all the muscles responsible for biological and psychological functions, besides every non-verbal social relation or comunication. Its main characteristic is a low energetic level what allows human beings to stand up for a long time without any sign of tiredness. As a result, tonicity also enfolds muscle power appreciation for it is neurologically linked to it.

The other structural psychomotor function used in this study was balance. Fonseca (1995) asserts that it gathers a colletion of dinamic and static skills, including postural control and the development of locomotion habilities.

Tai Chi Chuan is a way to keep healthy throughout one´s life. There are various stablished positions in it, each one with a different name. They all aim to develop balance and tonus control. Tai Chi presents a strong focus on the base of the body, setting the practitioners in low, medium and high postures.

Methodology

Sample

This research selected nineteen female elders between 60 and 63 years old who practiced Tai Chi Chuan three times a week for an hour. They were all from a social program that took place on a square in the neighborhood of Leme and was sponsered by the city of Rio de Janeiro.

The selected women practice the following techniques: a sequence of 24 “Beijing” Movements, Tai Chi Chuan with a fan and Chi Kung exercises. Therefore this study investigated nineteen female elders who had been assidously practicing Tai Chi for a year, being observed however just for a period of six months in concern of their tonicity and balance.

Instruments:

The instruments applied in this research were two sub tests from “Bateria Psicomotora” (BPM), developed by Fonseca (1995). We only used the two tests refering to tonicity and balance.

Statistics

The current study observed a Static Treatment that was subdivided in two parts. The first related to Descriptive Statistics for we intended to characterize our chosen population. In order to do so, average, minimum, maximum and standard deviation parameters were used to define continuous variables, or in other words, the ones that respect a specific metric system. For the variables that had discrete values, which derive from classifying systems and are scored according to a counting system, we used Frequency Tables. After crossing the results, they were presented in graphics with concise images to illustrate our conclusions. In addition, we associated the tables and graphics to their corresponding text descriptions and considerations, in a heuristic analysis which presents the results in such a way that the most frequent variable serves as a means to understand the most probable one.

The second part of the Statistics was structured by the Inference Statistics techniques, through which we developed the hypothesis tests, aiming to verify the degrees of acceptance to Null Hyphotesis. For the continuous variables, we used the Student test and, for the ones of discrete nature, the non-parametric Chi-Squared, attempting to evaluate the degree of agreement and association of the frequency tables.

A level of significance $p < 0.05$ was adopted as the basis for a critical analysis of the results refering to Inference Statistics.

All the results are limited to this particular research in order to avoid the inducing method which is not suitable in this case.

Results

This chapter intends to present and make comments about the results of our research.

During the testing period of six months, new Tai Chi Chuan techniques were introduced: Simple Tui Shou and Yang traditional style San Shou, besides Beijing´s Tai Chi sword technique with 32 movements.

Right after this paragraph, you will find the descriptive results of the average values and other test statistics. In addition, the comparative results of the Hypothesis tests (Student t-test) were presented, observing a level of significance p<

0.05. Finally, there is a comparative analysis of the average values of the two time span limits (pre and post testing) and qualitative diagnosis, with medium values concerning "worsening", "same" and "improvement".

Table 1: Comparative results of the medium values

Variable I	Pre	S.D.	Post	S.D.	Sig.p	Outcome	Comparing	Diagnosis
Tonicity	2.9	0.3	3.5	0.5	0.0028	Different	Pre < Post	Improvement
Balance	2.4	0.6	3.5	0.5	0.0000	Different	Pre < Post	Improvement
Balance	2.8	0.4	3.5	0.5	0.0014	Different	Pre< Post	Improvement

From the 32 analysed aspects, 19 showed improvement while 13 remained the same, and there was no worsening at all. The tests in which the elders presented some bettering were similar to the Tai Chi Chuan exercises they were taught during the program. At the same time, the exercises that showed no improvement were not similar to what they had been learning over the classes.

Table 2: Frequency distribution in order to obtain a final diagnosis for each level of:

Summary	Worsening	Same	Improvement	Total
TE	0	3	4	7
PS	0	1	3	4
PT	0	4	0	4
DD	0	0	1	1
S	0	1	0	1
EI	0	1	4	5
ED	0	3	7	10
Total	0	13	19	32
Summary	Worsening	Same	Improvement	Total
Distribution	0.0%	40.6%	59.4%	100.0%

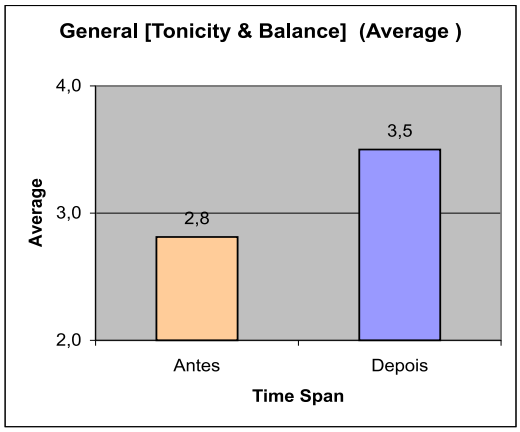
Table 3: General Results

	Tonicity	Balance	General
Before	2.9	2.4	2.8
After	3.5	3.5	3.5

We used the Student t-test as a means to analyse comparatively the time range average values (pre and post testing), with a level of significance $p < 0.05$. Throughout the three crossings, Tonicity (sig $p = 0.0028$), Balance (sig $p < 0.0001$) and General (sig $p = 0.0014$) with their respective significance values, demonstrated that there were important differences concerning the average values. Thus we can affirm that the adoption of practicing Tai Chi Chuan follows a cause and effect rule, resulting in the motor improvement of the practitioner.

Tonicity improvement was already expected because, being a martial art, Tai Chi aimes to strengthen the body. The elders performed various static Tai Chi Chuan exercises, intending to better their tonicity, besides other techniques which dealt with body movement in a slow and coordinated way (such as the Tui Shou sequence). They also had to practice fast, explosive and vigorous movements, like the Fa Jing. There were activities with an extra implement as well, the Tai Chi sword tecnique.

Image 1 Average



Through the graphics, we are able to notice a significant evolution on the two analysed psychomotor aspects, which was already expected according to our hyphotesis.

CONCLUSION:

This study concluded that there was an improvement of 59% concerning the evaluated motor dimensions of the selected women while 41% remained equal. The data shows that, over a six month period, there was a relevant bettering in the psychomotor aspects of tonicity and balance. The tested elders responded positively to our original hyphotesis.

It is important to highlight that, concerning the two psychomotor aspects (tonicity and balance), we perceived signicant and positive changes by comparing the pre and post values of the time span. Consequently, the group of elders presented relevant alterations on their averarge scores, according to the psychomotor evaluation protocol of Victor da Fonseca (1995).

Another significant aspect to be mentioned is that even considering their progressive aging, the elders were able to maintain and/or develop their motor skills and we did not register any case of regression. Clearly, it was easier for the women to perform the BPM tests (Fonseca) that were similar to the exercises they practiced during Tai Chi Chuan classes, such as keeping static posture (static balance), achiving a greater score as a result. The tests in which the elders got their worse scores were the ones that had less to do with the movements applied by the program.

We presume that the pedagogic evolution of this trainning program contributed in a significant way to the psychomotor improvement related to tonicity and balance, bettering the elders´ quality of life and autonomy.

We recommend further research in this same área, but with a broader sample, and other studies analysing all seven psychomotor factors. It would also be interesting to study people of both genders and various ages, in order to gather more data on the subject. In addition, we suggest interdisciplinary perspectives aiming to expand our knowledge on this ancient oriental art, promoting the development and popularization of its practice. Therefore, this subject could be approached by different sciences such as Psychology, Physiology, Biomechanics, Antropology, Sociology, Biophysics, etc... At last, it would be useful to compare the benefits acquired from differing styles of Tai Chi Chuan, measuring their different intensities.

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ANALYSIS OF PSYCHOMOTOR STRUCTURES TONICITY AND BALANCE OF FEMALE ELDERES THAT PRACTICE TAI CHI CHUAN

This study aimed to investigate the tonicity and balance levels of female elders in a Tai Chi Chuan training program, over a time span of six months between pre and post testing.

Our research group selected nineteen female elders, ranging from sixty to sixty three years old, and who practiced Tai Chi Chuan three times a week for an hour.

In order to gather the data, we applied two subtests of Bateria Psicomotora (BPM) - developed by Fonseca (1995) refering to tonicity and balance. In addition, the comparative results of the hypothesis tests (Student t-test) had a level of significance $p < 0.05$, followed by a comparative analysis of the average of the two time span limits (pre and post testing), reaching a qualitative diagnosis, with average values related to “Worsening”, “Same” and “”Improvement”.

From the thirty two analysed aspects: nineteen showed some improvement, thirteen remained the same and there was no evidence of worsening. Over all, 59% of their motor skills improved and 41% were equal. The data demonstrated that during our time range of six months, there was a significant improvement of the psycomotor aspects of tonicity and balance. The elders responded positively to the study´s hyphotesis: Tai Chi Chuan as an efficient contributor to psychomotor bettering in relation to tonicity and balance.

Key words: Tai Chi Chuan, elders, tonicity and equilibration

L' ANALYSE DES STRUCTURES PSYCHOMOTRICES LA TONICITÉ ET L' ÉQUILIBRE DES ANCIENNES PRATIQUANTES DE TAI JI QUAN

LE RESUMÉ

Cet étude a eu l'objectif d'avérer le niveau de tonicité et d'équilibre des anciennes à travers d'entraînement de Taiji Quan, ayant une épreuve antérieure et depuis six mois d'entraînement, une épreuve dernière. Dix-neuf anciennes ont été choisies entre soixante et soixante-trois années, pratiquantes de Taiji Quan, avec une fréquence de trois fois par semaine, pendant une heure par jour. Les notes ont été enregistrées en appliquant deux tests de la Batterie de tests Psychomotrices (BPM), de Fonseca (1995), tous eux concernants à la tonicité et à l'équilibre. Les résultats comparatifs des tests d'hypothèse t de Student ont été aussi presentés, en observant le niveau de signification $p < 0,05$, d'après les analyses comparatives des moyennes des deux extraits temporaires, Avant et Après et le résultat qualitatif avec les moyennes relatives à Rendre Pire, Stabiliser et Améliorer. Des trente-deux aspects analysés, dix-neuf on a enregistré Améliorer et treize on a enregistré Stabiliser. Cet étude a montré que 59% des anciennes ont amelioré leurs dimensions motrices et 41% des anciennes ont stabilisé leurs dimensions motrices. Ces notes ont montré que pendant la période de six mois il y a eu une amélioration signifiante autour des aspects psychomotrices de la tonicité et de l'équilibre. Les anciennes averées ont repondu de manière positive à l' hypotèse de ce test lá, qui affirmait que le Taiji Quan aiderait significativement les amendements psychomotrices liés à la tonicité et à l'équilibre.

Les Mots Clés: Le Taiji Quan, Les Anciennes, La Tonicité et L' Équilibre.

ANÁLISIS DE LAS ESTRUCTURAS PSICOMOTORAS -TONICIDAD Y EQUILIBRIO DE ANCIANAS PRACTICANTES DE TAI CHI CHUAN

RESUMEN

El objetivo del estudio fue la investigación del nivel de tonicidad y equilibrio de ancianas en un programa de entrenamiento de tai chi chuan,después de seis meses entre previas y posteriores pruebas.Fueron seleccionadas diecinueve ancianas entre sesenta y sesenta y tres años de edad, que practiban el tai chi cuan tres veces a la semana durante una hora al día.Los datos han sido recogidos tras la aplicación de dos subtestes de la Batería Psicomotora(BPM)de Fonseca (1995), siendo ellos con referencia a la tonicidad y equilibrio.Fueron tambiém presentados los resultados comparativos de los exámenes de Hipótese t de student.observando el nivel de significancia p 0,05, siguiendo los análisis comparativos de los promedios de los dos estratos temporales,anterior y posterior, y del resultado diagnóstico cualitativo con promedios relativos a peora, mantenimiento y mejora.De los teinta y dos aspectos analisados, diecinueve ensenãron mejora y trece se

mantuvieron, no registrándose peora.Este estudio concluyó que hubo desarrollo de 59% de las dimensiones motoras evaluadas de las ancianas y 41% se mantuvieron.Ello expone que durante el periodo de seis meses hubo avances relacionados a los aspectos psicomotores de tonicidad y equilibrio.Las ancianas evaluadas contestaron de manera positiva a la hipótesis de esta investigación,lo cual considera la contribución significativa del tai chi chuan con el desarrollo psicomotor relacionado a la tonicidad y al equilibrio.

Palabras clave tai chi chuan, ancianas, tonicidad y equilibrio.

ANÁLISE DAS ESTRUTURAS PSICOMOTORAS TONICIDADE E EQUILIBRAÇÃO DE GERONTES DO GÊNERO FEMININO PRATICANTES DE TAI CHI CHUAN

RESUMO

O objetivo desse estudo foi investigar o nível de tonicidade e equilibração de gerontes do gênero feminino em um programa de treinamento de Tai Chi Chuan, após seis meses entre pré e pós-testagem. Foram selecionadas dezenove gerontes do gênero feminino entre sessenta e sessenta e três anos de idade, praticantes de Tai Chi Chuan, com uma frequência de prática de três vezes semanais, durante uma hora por dia. Os dados foram coletados a partir da aplicação de dois sub-testes da Bateria Psicomotora (BPM), de Fonseca (1995), sendo eles referentes à tonicidade e à equilibração. Foram também apresentados os resultados comparativos dos testes de hipótese t de Student, observando um nível de significância $p < 0,05$, seguido das análises comparativas das médias dos dois estratos temporais, Pré e Pós e do resultado diagnóstico qualitativo com médias relativas à Piora, Mantém e Melhora. Dos trinta e dois aspectos analisados, dezenove mostraram melhora e treze se mantiveram, não tendo sido registrada nenhuma piora. Este estudo concluiu que houve uma melhora de 59% das dimensões motoras avaliadas das gerontes e 41% se mantiveram. Tais dados evidenciaram que durante o período de seis meses houve uma melhora significativa com relação aos aspectos psicomotores de tonicidade e equilíbrio. As gerontes testadas responderam positivamente à hipótese dessa pesquisa, que consistia em que o Tai Chi Chuan contribuiria significativamente com as melhorias psicomotoras relacionadas à tonicidade e à equilibração.

Palavras Chave: Tai Chi Chuan, Gerontes, Tonicidade e Equilibração.