

## Rehabilitation methods of balance, flexibility and motor performance in the disabled physico\_motor, young man

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### ABSTRACT

The main purpose of the present study was to determine the effect of Tai-Chi and Chi-Kong exercises on the static and dynamic balance, flexibility and motor performance of male disabled regarding to their motor-physical actions. About 30 people of the motor-physical disabled of Tabriz City Rehabilitation clinic had been voluntarily participated in this study. These disabled were divided into two equal groups of experimental group (15 people) including the mean, deviation, age 52.68 years old and weight 74.43kg and height 170.27cm and the second 15 ones group as control group including the mean age 26 years old, weight 75kg and height 172.2cm in this study. The statistic balance and dynamic balance, flexibility (seating and press test) and motor performance (UPDRS test) as well as former samples and after eight-week exercises were all analyzed. Dependent t was applied to compare the inter-group evaluation and t-independent was also used in order to compare the intra-group cases ( $p < 0.05$ ). The results after eight week showed that the significant recovery exercise could be concluded that the statistic and dynamic balances, flexibility and motor performance of disabled were also observed significantly ( $p < 0.05$ ). Based on the results of the present study, the exercises of Tai-Chi and Chi-Kong could increase the static and dynamic balances, flexibility and motor performance as well as muscular strength and power of all disabled. Hence, it was also recommended all disabled to apply the related process potentially.

**Key words:** exercises of Tai-Chi and Chi-Kong, rehabilitation, balance, flexibility, motor performance

### INTRODUCTION

The disability is an inevitable reality that has been recognized as a social phenomenon since the past era up to the present modern community. Individuals having physical- motor performance disability are challenging with the most worsened health affairs suffering from the life satisfaction along with low level of the life quality; these individuals are also suffering from the highest level of depression being little paid attention emotionally by their family members; they have not got any social commitments emotionally (Ghasemi et al, 2009). The physical- motor performance disabilities have been considered as a damage or trauma devastating all main life chores and daily issues of a person (Jalali Farahani, 2014). It is estimated that about 10% of the world population (about 650 million people) live along with a disability (world health organization). Tai-Chi is a very special exercise providing all body energy relying on the internal energy of the body and making the most sophisticated benefits for the body, spirit and our whole body limbs internally and externally. The beautiful stream of Tai-Chi makes the body energy giving all comfort for our body limbs. Tai-Chi is a kind of meditation through the body motion; this leads to the cerebral relaxation optimizing all chemical balance into the brain efficiently (Cohen, 2009). Chi-Kong is subjected to the skill semantically and it also is related to an artistic activity that the focus of the Chi and its stream can be also understandable. Chung Sun Feng in 1101 is the first person that has invented the Tai-Chi. Ability of keeping of a one status for achieving the intentional activities and overcoming against the internal and external challenges as well as keeping the body gravity in the related gravity level restriction of the body biomechanically are defined as exercising the Tai-Chi sport subjects (Boor Stein et al,

1977). The flexibility of the motion domain around a certified joint or a group of the joints is also defined in the Tai-Chi sport achievements (Ghaeeni and Rajabi, 2014). The motion function (power and strength) of the muscular strength is subjected to the capacity of a one muscle or a group of muscles for frequent contraction and ability of applying the power and keeping of the related ability for long term (Khaldan, 2003). The muscular power is subjected to the ability or capacity of a one or a group of muscles for achieving the maximum power against a tolerance (Gaheeni and Rajabi, 2014). The adolescent era of the related period is one of the most fundamental eras for making essential decisions and this ranges from 25 to 65 years old (WHO, 2018). The health specialists say that: when we can use our heart and energy to treat the diseases, why not? According to some carried out studies during the years, there have been obtained more acceptable results in this pavement. Individuals using Tai-Chi and Chi-Kong for both remedial and recreational aims have seen very acceptable and enjoyable results in this regard. all we know that the man is belonged to the nature and all motions are also coming from the same nature and for the reason this exercise can be considered as a great supplementation for remedy of all welfare and rehabilitation actions of the man because this will make some useful and fruitful consequences for individuals using the Tai-Chi and Chi-Kong and in addition, this will be considered a great supplementation for physical abilities and the evolution of all motor performance s among disabled individuals; this will also recover all motor performance keeping the preservative actions of the body. This exercise is good for all rapid actions under the mental and periodical pressures preventing all secondary damages and reducing all physical pressures and raising the flexibility and motor

performance among young male disabled; for the reason, the main aim of the present study is to determine the effect of Tai-Chi and Ch-Kong on the balance, flexibility and motor performance in this regard.

**Necessity of carrying out the study:** It is stated in the former studies that it has been estimated that about 10% of the world's population (about 650 million people) have got a one disable case in their daily life (world health organization). The motor-action-physical disabilities make some problems and restrictions for individuals functionally and they may have some other psychological effects in social interactions on a disabled person (Galvosi et al, 2011). The young disabled individuals with motor-action-physical disabilities have galore of problems in terms of motion actions. The lack of motion actions of these individuals make them facing many various problems and these influence on the balance, flexibility and motor performance. Also, Karahat and Botham (2006) stated that these individuals have weak mental health, little life satisfaction, highest depression levels, little emotional supports, weakened social commitment and participation. Also, some studies have shown that when young individuals with motor-action-physical disabilities participate in sport exercises, they can get recovered in relation to the motion actions. Although this idea regarding to Tai-Chi and Chi-Kong has not been confirmed that these exercises can be led to change some basic changes regarding to the functional capacity but there should be carried out more studies regarding to the same topic potentially; Researcher of the present study hopes that the results of the present study will be a great help for all disabled to find some useful approaches for treating the mental problems of the disabled individuals efficiently. This will also add some enriched literature on the treatment approaches theoretically.

Ebaro et al in a study titling the evaluation of the Tai-Chi-Chuwan and training Chi-Kong on the cardiovascular patients in 2007 by random method on 52 people showed that these patients have been considerably recovered by Tai-Chi exercise and the scores of the depression signs had been also reduced in this regard; this has been also led to increase considerably the life quality of the same patients. The research of the China Health Organization, Tai-Chi and its effects over old people showed positive consequences in 2012 making some effective results and effects on the muscles of old people raising their life satisfaction day to day; this research had been carried out by accidental method in two observational and interventional groups. Qo et al in a study carried out the effect of Tai-Chi among osteoporosis patients in 2014 in China. Tai-Chi has been also recommended as a substitution therapy and supplementation for managing the knee arthritis. This study has been also carried out as accidental approach into both observational and interventional groups for 6 months on 140 patients. The results showed useful cases and the patients showed the reduction of the depression and increase of the motor performance. San and Boues in a study titling the investigation of the effectiveness of Tai-Chi program for recovering the health status of old individuals with hypertension and risky factors of the diabetics and life quality in China in 2015 showed that in the end of the

intervention program 266 patients left in the study showing the hypertension and medical biological factors due to the diabetics global institution standard in 2002 and then they had been carefully measured regarding to the life quality and their health affairs; it is specified that Tai-Chi is very effective to control and recover the old people hypertension reducing the BMI keeping the renal function raising the life quality health. William et al (2015) carried out the effects of Tai-Chi seating on the power and balance in the life quality of individuals with cerebral trauma in 2015 by accidental approach in two groups of observation and intervention; the results showed considerable recovery for the power and dynamic balance of these individuals. Azimzadeh et al in a study showed the effect of Tai-Chi-Chuwan exercise on the life quality of women with multiple sclerosis in 2013; the results of the study showed that achieving Tai-Chi-Chuwan has a great influential influence on the increase of life quality and its dimensions regarding to mental problems, ache, social function energy and physical health of patients with MS efficiently. Chen et al (2015) in a study titling the effect of Tai-Chi in four conditions of the chronic cancer, arthritis, cardiac and pulmonary blockage in a systemic method after a comprehensive evaluation of the life quality, entered 33 cases into the study; the results showed that the suitable effect of Tai-Chi to recover the physical function can increase the conditions of these individuals potentially. Tesay et al (2015) in a clinical experimentation with clustering accidental method and 20 week effect of Tai-Chi showed that this can reduce the ache of old individuals with cognitive and knee arthritis disorder; the results showed that Tai-Chi can be considered as a great intervention for reducing the osteoporosis pain as a pharmaceutically intervention. In olds with cognitive disorder, Kyuo et al (2015) in a study titling the physiological responds of Tai-Chi in patients with COPD in compare to Tai-Chi with treadmill concluded that Tai-Chi as a physiological stimulant may be an acceptable method for pulmonary recovery that has been acceptable in some areas of the world. Qo et al (2015) in a study titling the effect of Tai-Chi in patients with knee osteoporosis on 1400 people carrying out by accidental method in two observational and interventional groups after 6 months exercise showed the most useful results for treating these patients. Many various studies have not been carried out in this pavement.

## **METHODS AND MATERIALS:**

Since the present study has been subjected to carry out the investigation of the effect of the independent variable (exercise program of Tai-Chi and Chi-Kong) on the dependent variables (balance, flexibility and motor performance) and the completion conditions of the research has not been achieved simultaneously by the researcher control, this study is established in the field of the semi-experimental type of studies. Due to the manipulation of the independent variable by the researcher to evaluate the effects of the process on the next changes of the dependent variable, the research is type of future-seeking studies and based on the subject and target of the study, this also is an applied type of studies. Research plan of the study is applied pre and post tests with control group that the subjects are firstly substituted into the groups by

the medical, sport, psychological questionnaire accidentally. Before implementing the independent variables to make the convergence of the groups, the dependent variables of both groups have been established into the pre-test of the tested case. Then, the independent variables have been implemented into the experimental groups. In the end, the dependent variables of both groups were measured in the post test in both related groups.

**Population and statistical sample:** The statistical population of the present study includes 30 young male disabled of Tabriz City. First, a questionnaire has been given to the disabled to receive all personal backgrounds and medical history of the subjects and then after completing the questionnaire by 30 people and receive of the satisfaction consent of all subjects with evaluation of the height, weight, medical history, type of rehabilitation, surgery, sport background and physical health of subjects, the medical screening has been also carried out over all subjects in this study. Individuals having special therapy or treatment have been also eliminated from the study; according to the completed questionnaires, 30 people have been taken up and then they have been established

accidentally in two equal 15 ones groups with experimental and control groups. The experimental group carried out Tai-Chi and Chi-Kong exercises for twenty four weeks and three sessions per week for 90min and the control group continued their daily rehabilitation program.

**Exercise protocol:** The basic motor-actions of Tai-Chi streaming into all body levels carried out with seating, stretching hands in all sides, leg motor-actions and posterior and anterior sides of the back and turning head along with eyes' motions, Chi-Kong has been also given with Tai-Chi motions combinations; this has been also combined with deepest abdominal halation and inhalation breathes and loosing and keeping the muscles in special motor-actions.

**Statistical methods and data analysis:** T-correlation statistical method is applied for investigating the differences of the intra-groups cases and t-independent statistical method has been also applied in order to compare the inter-group cases. It should be mentioned that SPSS version 16 has been applied in order to represent all data and the significance level for calculating P is considered lower than 0.05.

## RESULTS

Table 1: results of t-correlation test to compare the intra and inter-groups of static balance status of subjects in both control and experimental groups

Variable	Group	M±SD	M±SD	T	P
		Pre test	Post test		
Static balance	Control	9.95±1.9	9.86±1.8	0.9	0.3
	Experimentation	9.69±2	13.13±1.3	-8.1	0.0
	Pre test	9.9±1.9	9.6±2	0.3	0.7
	Post test	9.86±1.8	13.1±1.3	-5.4	0.0

The information of the table represent that there is no observed any significant difference between the means of pre and post tests of static balance variable ( $p = 0.351$ ) in control group in  $P < 0.05$  significant level but there is observed a significant difference between the means of pre and post tests in experimental group. Hence, the Tai-Chi and Chi-Kong exercises influence on the samples static balance.

Table 2: results of t-correlation test to compare the intra and inter-groups of dynamic balance status of subjects in both control and experimental groups

Variable	Group	M±SD	M±SD	T	P
		Pre test	Post test		
Dynamic balance	Control	8.8±1.1	8.7±1.1	1.7	0.1
	Experimentation	8.9±1.2	7.5±1.5	3.18	0.0
Dynamic balance	Pre test	8.8±1.3	8.9±1.2	-0.2	0.7
	Post test	8.7±1.1	7.53±1.5	2.3	0.0

The information of the table represent that there is no observed any significant difference between the means of pre and post tests of dynamic balance variable ( $p = 0.102$ ) in control group in  $P < 0.007$  significant level but there is observed a significant difference between the means of pre and post tests in experimental group. Hence, the Tai-Chi and Chi-Kong exercises influence on the samples dynamic balance.

Table 3: results of t-correlation test to compare the intra and inter-groups of flexibility balance status of subjects in both control and experimental groups

Variable	Group	M±SD	M±SD	T	P
		Pre test	Post test		
Flexibility	Control	3.36±0.4	3.5±0.6	-0.81	0.4
	Experimentation	3.3±0.3	6.1±0.4	-37.9	0.0
Flexibility	Pre test	3.3±0.4	3.3±0.3	0.4	0.6
	Post test	3.50±0.6	6.1±0.4	-15.6	0.0

The information of the table represent that there is no observed any significant difference between the means of pre and post tests of flexibility balance variable ( $p = 0.428$ ) in control group in  $P < 0.05$  significant level but there is observed a significant difference between the means of pre and post tests in experimental group. Hence, the Tai-Chi and Chi-Kong exercises influence on the samples flexibility balance.

Table 4: results of t-correlation test to compare the intra and inter-groups of motor performance balance status of subjects in both control and experimental groups

Variable	Group	M±SD	M±SD	T	P
		Pre test	Post test		
motor performance	Control	15.4±0.6	15.3±0.6	1.6	0.1
	Experimentation	15.2±0.7	17.5±1.0	-10.8	0.0
	Pre test	15.46±0.616	15.25±0.708	0.880	0.387
	Post test	15.36±0.675	17.58±1.08	-6.718	0.000

The information of the table represent that there is no observed any significant difference between the means of pre and post tests of motor performance balance variable (p = 0.119) in control group in P < 0.05 significant level but there is observed a significant difference between the means of pre and post tests in experimental group (p = 0.001). Hence, the Tai-Chi and Chi-Kong exercises influence on the samples motor performance balance.

Table 5: results of t-correlation test to compare the intra and inter-groups of muscular tolerance status of participants balance status of subjects in both control and experimental groups

Variable	Group	M±SD	M±SD	T	P
		Pre test	Post test		
Muscular tolerance	Control	33.8±1.6	33.6±1.7	0.9	0.3
	Experimentation	34.2±2.4	41.1±1.8	-16.5	0.0
	Pre test	33.8±1.6	34.22±2.4	-0.4	0.63
	Post test	33.6±1.7	41.12±1.8	-11.2	0.0

The information of the table represent that there is no observed any significant difference between the means of pre and post tests of muscular tolerance of participants balance variable (p = 0.351) in control group in P < 0.05 significant level but there is observed a significant difference between the means of pre and post tests in experimental group (p = 0.001). Hence, the Tai-Chi and Chi-Kong exercises influence on the samples muscular tolerance of participants balance.

Table 6: results of t-correlation test to compare the intra and inter-groups of power status of participants balance status of subjects in both control and experimental groups

Variable	Group	M±SD	M±SD	T	P
		Pre test	Post test		
Power	Control	25.5±1.0	25.5±0.8	0.0	0.9
	Experimentation	23.7±1.7	27.4±1.5	-16.5	0.0
	Pre test	25.5±1.0	23.7±1.7	-0.4	0.6
	Post test	25.5±0.8	27.4±1.5	-11.2	0.000

The information of the table represent that there is no observed any significant difference between the means of pre and post tests of power status of participant variable (p = 0.963) in control group in P < 0.05 significant level but there is observed a significant difference between the means of pre and post tests in experimental group (p = 0.001). Hence, the Tai-Chi and Chi-Kong exercises influence on the samples power status of participants balance.

**DISCUSSION**

The results of the present study showed that there is a significant difference between the control and experimental groups after 24 week exercise for motor performance ability. Tai-Chi and Chi-Kong is coming along with deepest breathing and stretching motions in different sides and angles leading to the recovery of the static balance of the subjects. The results of the present study are adaptive with the results of Ebaro et al (2007), Qo et al (2014), San and Boues (2014), William et al (2015), Chen et al (2015); they showed in a study that the effects of 8 week Tai-Chi and Chi-Kong on 45 people physical disabled individuals can increase significantly the static balance of the same subjects after 8 week exercise. The dynamic balance in the present study observed with the motions of Tai-Chi and Chi-Kong; in the research of Tesay et al (2015) in the clustering accidental clinical experimentation, the effects of 20 week Tai-Chi and Chi-Kong reduced the pain of the individuals with cognitive disorder and knee arthritis. The results showed that Tai-Chi can also be considered as a great pharmaceutically intervention for reducing the osteoporosis pains. There has been established and observed significant difference on the dynamic balance. The different motions of Tai-Chi and Ch-Kong can also

recover the balance. The flexibility is another important factor for the health and Tai-Chi with different angles and motions can also recover the motor performance of the flexibility. People with the lack of the motor-actions in the study of Qu et al (2015) in a study titling the physiological responds of Tai-Chi in patients with COPD in compare to Tai-Chi with treadmill concluded that Tai-Chi as a similar physiological stimulant may be considered as an acceptable method for rehabilitating the flexibility that it has been also acceptable in some areas of the world. Tai-Chi and Chi-Kong are coming along with weight tolerance of the down area of the body and special motions of the upper limb of the body with stretching and concentration motions requiring special neural arrangement because this will lead to recover the related process. Zhu et al (2015) in a study titling the effect of Tai-Chi in patients with osteoporosis on 1400 people accidentally in two groups of control and experimentation after 6 months showed that these exercises can efficiently recover and reduce the pain of patients increasing the ability of the same patients. The muscular tolerance is achieved with slow motions coming along with some interruptions in motion and begins again with some seconds and inhalation and halation influencing on the tolerance. Also, the results of the present study

showed that there is a significant difference between the control and experimentation groups after 24 week exercises of Tai-Chi and Chi-Kong for keeping the muscular tolerance and motor performance. The results of Ebaro et al (2007), Zhu et al (2014), San and Boues (2014), William et al (2015) and Chen et al (2015) are adaptive together. Tai-chi and Chi-Kong have special influence on the muscular tolerance. The research of China Health Organization showed that Tai-Chi and Chi-Kong have suitable effective effects of the olds life quality in 2012 and these positive effects are very effective for their muscular power raising the life satisfaction of the same population. This study has been carried out by accidental method with two observational and interventional groups. Jio et al (2015) in a study titling the effect of Tai-Chi among patients with osteoporosis of the knee on 1400 patients has shown that Tai-Chi and Ch-Kong are very effective to treat and reduce the pains of the osteoporosis and knee problems after 6 months exercise of the same process. Therefore, it is roughly felt to carry out exercise program for individuals suffering from a special body limb pain because this will recover the motor-actions skills, physical status, behavioral cases of all subjects particularly these will reduce the patients' expenditures efficiently in this pavement. On the other hand, it is stated that the consumptive energy expenditure is considered as the main factor for reducing the walking issues so that the consumptive energy of disabled individuals is three folds higher than usual people. On the other hand, it is specified that the physical disabled individuals have weakened muscles in compare to their co-ages. They stated that the surface of the small muscles is the main weakness of the opposed muscles simultaneously for disabled individuals (Willy, 1998). Also, Willy et al in a study showed that the speed of walking after one period of time has not been increased.

## CONCLUSION

According to the review of the research literature regarding to the motor-actions and physical problems, it is concluded that the disabled young individuals with some disorders in their body function such as Spasticity are facing with the reduction of the muscular power particularly in the motor-action control and these disorders influence on the functional activities and participation at life. Also, depending on the type and intensity of the disability, there have been observed different disabilities grades for these disabled individuals. The results of the present study showed that after 24 week participation of Tai-Chi and Chi-Kong, the balance, flexibility and motor performance can be efficiently recovered in this regard. Finally, it is concluded

that the exercises of Tai-Chi and Chi-Kong can increase the motor performance and this will also reduce the functional activities disorders recovering the efficacy of disabled young individuals suffering from the related disorder.

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