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Life Satisfaction and Hopelessness in Elderly: Tai-Chi Chuan Outcomes

[1]Ali Tekin, [1]Fahri Akçakoyun, [2]Murat Eliöz, [3]Bülent FiŞekçioğlu, [4]Metin Şahin and [1]Selçuk Özdağ

[1]School of Physical Education and Sports, Muğla University, Muğla, Turkiye
[2]Teacher of Physical Education and Sports, Kocatepe Primary School, Samsun, Turkiye
[3]School of Physical Education and Sports, Selçuk University, Konya, Turkiye
[4]Predisent of Turkish Taekwondo Federation and School of Physical Education and Sports, Selçuk University, Konya, Turkiye

Abstract: The aim of this study was to determine the effect of Tai Chi Chuan (TCC) on some physical parameters, life satisfaction and hopelessness levels in elderly considering sex. The TCC group participated in a TCC program with 24 forms. Data were collected as pre and post tests, by Life Satisfaction Scale (LSS), Beck Hopelessness Scale (BHS), strenght, flexibility, aerobic endurance, velocity, dynamic balance, 8 feet and 6 meter walk measurements. The data analysis were done by Wilcoxon and Mann-Whitney U tests. Pre and post test results of female participants in TCC group exposed significant differences in dynamic balance at $p<0.001$ level, lower extremity strenght and upper extremity flexibility at $p<0.01$ level and aerobic endurance at the level of $p<0.05$. On the other hand, there were significant differences in male participants' scores for all parameters excluding lower extremity flexibility. Participation in TCC has an positive effect on physical parameters, hopelessness and LS level of both sex in elderly.

Key words: martial arts · Breathing exercises · Sport psychology · Aged

INTRODUCTION

Advancing age is associated with structural and functional changes in all organ systems, resulting in physiological and psychological decline [1]. Life satisfaction (LS) is the cognitive evaluation of one's life as a whole. The most important factors determining the life satisfaction of the elderly is their level of functional independence [2]. Hopelessness is a psychological construct that underlies a variety of mental disorders. Hopeless individuals believe that nothing will turn out right for them, that they will never succeed at what they attempt to do, that their important goals can never be attained and that their worst problems will never be solved [3]. Farran *et al.* [4] identified four attributes of hopelessness: an experiential process, a spiritual/ transcendent process, an irrational thought process and a relational process. The experiential process in elderly involves the threat of further physiological loss, additional negative changes in physical health, unresolved issues and unmet goals. These result in dependency due to incapacitation as regards to everyday tasks and needs may evoke feelings of hopelessness and being a burden to society [5].

Many studies exposed that PE is positively related to psychosocial well-being among older adults; hopelessness [6, 7] and life satisfaction [8, 9]. Studies have also shown that increasing physical exercise (PE) in older age is important due to the range of associated health benefits such as improving balance, strength and gait endurance. PE has been shown to be an effective mode to circumvent age-related changes in the body [10]. As aforesaid, regular PE is well known to be an effective intervention in maintaining and improving the physical and mental health of older adults. In addition to the traditional Western forms of aerobic physical exercise, such as jogging, swimming and cycling, alternative modes of physical activity have the potential to be equally beneficial, yet more culturally appropriate, to some elderly ethnic groups. One such activity is Tai Chi Chuan (TCC). It was originally developed as a martial arts form, but has been used for centuries in China as an exercise by the elderly. It is a mind-body exercise that involves physical movements in sequencing of movement patterns and

Corresponding Author: Dr. Ali Tekin, School of Physical Education and Sports, Muğla University, Muğla, Turkiye.
Tel: +0252 2111958, Fax: +90(252) 2111933, E-mail: alitekin@mu.edu.tr.

motor planning [11]. A variety of health-related benefits, including improved cardiorespiratory function and enhanced psychological wellbeing [12, 13], have been examined previously. TCC is a suitable exercise for older adults because of its low velocity.

Although some research referred to the available effect of TCC on physical and psychological health in elderly, as Wu [14] reported that results of previous studies are scattered or inconsistent, that's why there is still a current evidence is required for TCC. Thus the present paper aimed to assess the efficacy of a 6 month TCC program for decreasing hopelessness and increasing life satisfaction, strenght, dynamic balance, velocity, flexibility and aerobic endurance levels in elderly.

MATERIALS AND METHODS

The study was organized in İstanbul Municipality Darülaceze and covered 56 older people in total; 15 males and 13 females as Tai Chi Chuan (TCC) group; 15 males and 13 females as control group. Ethical committee report is available for the study. The researcher gave information to the elderly about the aim, scope and method of the study. The criterian was to be volunteer and not to have health problems.

TCC group participated in a TCC with 24 forms [15]. The TCC program lasted in six months. Each practice session included 10 min of warm-up exercise, 40 min of TCC practice and 10 min of cool-down exercise. Each form of TCC emphasized multidirectional weight shifting, awareness of body alignment and multisegmental movement coordination. In addition, regulated breathing was emphasized as part of the exercise. During the exercise, subjects were led by an experienced TCC instructor and imitated his/her motions and postures at the same speed. Subjects in the control group were instructed to continue their current level of physical activity. There was no contact between the study staff and control subjects except during data collection.

Data were collected as pre and post tests, by strenght, flexibility, aerobic endurance, velocity, dynamic balance, 6 meter walk [16], Life Satisfaction Scale (LSS) and Beck Hopelessness Scale (BHS). LSS was developed by Diener and *et al.* [17] and adapted into Turkish population by Köker [18] and Yetim [19]. BHS was developed by Beck and *et al.* [3] and the validity and reliability for Turkish population provided by Durak [20]. SPSS 11.5 version was used for data analysis applying Mann-Whitney U for independent and Wilcoxon test for dependent groups.

Table 1: Comparison of pre-post test results of physical parameters, life satisfaction and hopelessness according to sex in TCC group

	Female: n (13)			Male: n(15)		
	mean	sd	p	mean	sd	p
Dynamic balance						
8 feet walk pre test	12.79	1.66	***	9.76	2.33	***
8 feet walk post test	10.36	1.51		7.43	1.52	
Lower extremity strenght						
30 sec. sit up-down pre test	10.00	1.29	**	11.40	3.56	***
30 sec. sit up-down post test	11.69	1.43		14.46	3.90	
Flexibility						
Upper extremity pre test	- 19.46	8.94	**	- 16.53	8.81	**
Upper extremity post test	- 13.46	7.73		- 11.66	8.28	
Lower extremity pre test	- 5.76	8.27		- 8.60	8.85	
Lower extremity post test	- 3.53	9.59		- 4.80	10.84	
Aerobic endurance						
2 minutes step pre test	27.46	4.23	*	36.00	9.68	***
2 minutes step pre test	32.07	6.57		41.60	9.06	
Velocity						
6 meter walk Pre test	7.28	1.54	***	5.76	.87	***
6 meter walk Post test	5.87	1.43		4.18	.52	
Hopelesness						
Pre test	11.69	3.22	*	12.20	3.30	***
Post test	8.23	2.28		8.20	1.37	
Life satisfaction						
Pre test	15.00	6.14	*	15.73	7.63	*
Post test	20.69	7.22		20.80	6.71	

*p<0.05; **p<0.01; ***p<0.001; ss, standart deviation.

Table 2: Comparison of post test results of male and females in TCC and control group

	Female: n (13)			Male: (15)		
	Mean	SD	p	Mean	SD	p
Dynamic balance						
8 feet walk Control	18.41	6.64	***	12.93	8.46	***
8 feet walk TCC	10.36	1.51		7.43	1.52	
Lower extremity strenght						
30 sec. sit up-down Control	7.84	1.51	***	10.80	2.62	**
30 sec. sit up-down TCC	11.69	1.43		14.46	3.90	
Flexibility						
Upper extremity Control	-30.53	18.39	**	-26.20	12.57	**
Upper extremity TCC	-13.46	7.49		-11.66	8.28	
Lower extremity Control	-13.07	13.79		-24.33	9.61	***
Lower extremity TCC	-3.53	9.59		-4.80	10.84	
Aerobic endurance						
2 minutes step Control	18.07	8.90	***	30.20	10.70	**
2 minutes step TCC	32.07	6.57		41.60	9.06	
Velocity						
6 meter walk Control	14.64	10.48	***	7.08	3.83	***
6 meter walk TCC	5.87	1.43		4.18	.52	
Hopelesness						
Control	11.46	3.84	***	11.20	3.32	***
TCC	8.23	2.28		8.20	1.37	
Life satisfaction						
Control	15.92	5.17	***	15.73	5.59	***
TCC	20.69	7.22		20.80	6.71	

*p<0.05; **p<0.01; ***p<0.001; SD, standart deviation.

Findings: Fifty six old people participated in the study. The avarage age of male and female in control and exercise group was respectively 71.8 ± 5.17 (min:65, max: 83) and 76.5 ± 6.7(min:65, max: 87); 71.2 ± 6.5 (min: 65, max: 88) and 75.6 ± 7.5 (min: 66, max:89).

Pre and post test results of female participants in TCC group exposed significant differences in dynamic balance at $p<0.001$ level, lower extremity strenght and upper extremity flexibility at $p<0.01$ level and aerobic endurance at the level of $p<0.05$. On the other hand, there were significant differences in male participants' scores for all parameters excluding lower extremity flexibility.

Additionally, the participants' post test results compared regarding the groups they belong to. There were differences in scores of females in TCC and control groups significantly: life satisfaction, hopelessness, dynamic balance, lower extremity strenght, 2 minutes step, 6 meters walking at $p<0.001$; upper extremity strenght and flexibility at $p<0.01$ level. The significant differences for male participants of both groups were in life satisfaction, hopelessness, dynamic balance, 6 meters walking, lower extremity flexibility at $p<0.001$ level; and in lower extremity strenght, upper extremity flexibility, 2 minutes step at $p<0.01$ level.

DISCUSSION

In the present study, it was clear that TCC improved balance function, lower extremity strenght, upper extremity flexibility, aerobic endurance and velocity (although the movement of TCC is mainly isometric exercises and several very slow isotonic exercises) significantly. The results suggested that an 24-week intensive TCC program for the elderly had possibility to prevent loosing physical functions.

The use of TCC program made significant results in this long term study with a small sample size. Excluding velocity, these findings complement the results of previous studies, in which Tai Chi has been shown to be an simple, effective, lowcost and easily implemented intervention for the enhancement of physical parameters. Studies indicated that TCC enhances balance [21-23], strenght [24, 25], aerobic capacity [26, 27], flexibility in older people. A cross-sectional study was designed by The University of Vermont Physical Theraphy researchers to compare isokinetic strenght of leg muscles and foot center of pressure (COP) as a measure of sway between long term TCC practitioners and controls. Twenty subjects in the TCC group had practiced TCC for a minimum of 3 years and the 19 subjects in control group (age > 55 years) had no TCC experience. The results showed that the TCC group had significantly higher knee extensor strenght at all speed tested and a smaller foot COP excursions for both eyes and open and eyes closed conditions than the control group. These findings support the hypothesis that the maintenance of eccentric strenght of postural muscles in the lower extremities is helped through the long term practice of TCC [28]. In a meta analysis Taylor-Piliae and Froelicher [29] estimated the effect size of 441 studies. Aerobic capacity was higher in subjects performing a 52 week TCC intervention, compared with sedantary subjects. Thus TCC may be an additional form of aerobic exercise.

Another finding of present study is that TCC has also positive impact on (HPS) and LS. Some studies have explored the effect of TCC on psychological health status and psychosocial aspects [30, 31]. In 2004 Klein and Adams did a literature review in physical rehabilitation regarding comprehensive therapeutic benefits of TCC. Over 200 published reports were examined, 17 controlled trials were judged to meet high standart of methodological rigor. Controlled research evidence was found to confirm therapeutic benefits of TCC with regard to improving life satisfaction [29]. Li *et al.* [24] found that participants who completed a 6-month 24-form TCC program reported significantly higher life satisfaction than those in the control group. Using a randomized controlled trial, Li *et al.* [25] examined whether a 6-month TCC program enhanced elderly individuals' multidimensional, hierarchical physical self-esteem. Results indicated that individuals who participated in the 6-month TCC program showed increased levels of global self-esteem, domain-specific physical self-worth and subdomain-specific esteem of attractive body, physical strength and physical condition. Thus, TCC, a simple, low-cost form of physical activity, has the potential to alter favorably specific facets of physical self-worth/ esteem in older adults, which may in turn enhance important aspects of their quality of life and life satisfaction.

In a study of hope in the elderly, Herth [32] found that the elderly are particularly vulnerable to the effects of inactivity, so providing attainable activity can give them a sense of competence and hope. One can assume that low to moderate intensity exercise (TCC) may improve life satisfaction as a result of improvement in physical and functional well-being.

The studies concerning the role of TCC in well-being, linking to research on relaxation with regard to physiological and psychological wellness. All studies reported in PsychLit and Medline between 1996 and 1999 directly related to the subject. TCC as a form of moderate exercise may enhance overall psychological well-being. Cognitively, there are indications that TCC may lead to improvements in mood. However, it is not clear whether the positive effects of TCC are due solely to its relaxation and meditation component, or whether they are the consequence of various peripheral factors, since it is known that stress reduction often occurs when we indulge in activities we find pleasurable and satisfying [33].

Another possible mechanism is the combination of deep diaphragmatic breathing and relaxation with slow gentle movements in the TCC program that confers a sense of mental control on the practitioner. A key element in TCC is the incorporation of breathing control into each movement [34]. Thus TCC might be a therapeutic intervention [35].

Findings from the present study indicate that TCC participants reported greater positive changes in both physical and psychological well-being indicators the intervention. It is possible that the combined physical and mental components of TCC provided a mastery experience that increased the participants' sense of control over their physical and psychological health. That the beneficial effects of a TCC program can be experienced within a 6 month period of time suggests that the old could be motivated to engage in greater physical activity after TCC training, especially those who are habitually sedentary.

This study was limited by its small sample size, its involvement of only older in Darülaceze and the lack of randomization of participation-group status. These limitations make it difficult to generalize on these findings. It may have been methodologically ideal to randomize the group status, but from a public heath stance, it can be argued that it is unethical to place volunteers who are interested in improving their health into an inactive control group. Furthermore, health behavior theories, such as the transtheoretical model would predict greater success in changing activity patterns in a homogeneous group that were already at a contemplative or preparative state, rather than randomly including participants who may be simply in a precontemplative state and unprepared to change their behavior [36].

CONCLUSION

In conclusion, in the present study and previous ones, there are some signs that TCC can lead to improved physical and psychological well-being. However, the evidence is still not strong enough for us to make any conclusive remarks and no precise and accurate estimates of the effective size can be summarized. More well-designed TCC program with an appropriate follow-up period of time are required to evaluate the effect of TCC on physical and psychological health. Yet, the results far are promising and TCC deserves consideration as an option in the management of physical and physchological conditions.

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