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Effect of teakwondo training on self-control, quality of life and self-defense levels in sedentary women

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Abstract

In the existing literature, comparisons of physiological and performance data have been made in general with regard to taekwondo training applied to women. The objective of this study is to investigate the impact of taekwondo training on self-control, quality of life and self-defense capabilities in sedentary women. The study was conducted using the pre-test–post-test control group model, which is one of the experimental designs from quantitative research approaches and real experimental models. A total of 40 women were included in the study, comprising the exercise group (EG) and the control group (CG). No application was made to the control group. The study programme involved the participants engaging in Taekwondo kyorugi (basic and combined stances) exercises for a period of six weeks, three days a week, with each session lasting 60 minutes. The study employed a personal information form comprising seven questions, a quality of life scale, a multidimensional brief self-control scale and, finally, a physical self-defense scale for women. The data obtained from the study were analysed using the SPSS 21.0 statistical package programme. The sedentary women who participated in the study demonstrated increases in the sub-dimensions of all scales in the training group. Additionally, significant differences were observed in the quality of life sub-dimensions, the initiation sub-dimension of the multidimensional brief self-control scale, and the dangerous physical attack sub-dimensions of the physical self-defense scale for women. In the control group, significant decreases were observed in the mental health sub-dimension of the quality of life scale, as well as in both sub-dimensions of the multidimensional brief self-control scale and in the simple physical assault sub-dimensions of the physical self-defense scale for women. The findings indicated that six weeks of taekwondo training had a positive impact on the self-control, quality of life and self-defense capabilities of sedentary women.

Keyword: Self-control, quality of life, self-defense

Sedanter kadınlarda teakwondo antrenmanının öz kontrol, yaşam kalitesi ve öz savunma düzeylerine etkisi

Öz

Mevcut literatürde, kadınlara uygulanan taekwondo antrenmanı ile ilgili olarak genel olarak fizyolojik ve performans verilerinin karşılaştırmaları yapılmıştır. Bu çalışmanın amacı, sedanter kadınlarda Tekvando antrenmanının öz kontrol, yaşam kalitesi ve öz savunma yetenekleri üzerine etkisini araştırmaktır. Araştırma, nicel araştırma yaklaşımlarından ve gerçek deneysel modellerden deneysel desenlerden biri olan ön test-son test kontrol gruplu model kullanılarak gerçekleştirilmiştir. Çalışmaya egzersiz grubu (EG) ve kontrol grubu (CG) olmak üzere toplam 40 kadın dahil edilmiştir. Çalışma programı, altı hafta boyunca, haftada üç gün, her seans 60 dakika süren Taekwondo kyorugi (temel ve birleşik duruşlar) egzersizleri yapan katılımcılardan oluşmaktadır. Araştırmada yedi sorudan oluşan kişisel bilgi formu, yaşam kalitesi ölçeği, çok boyutlu kısa öz kontrol ölçeği ve son olarak kadınlara yönelik fiziksel öz savunma ölçeği kullanılmıştır. Araştırmadan elde edilen veriler SPSS 21.0 istatistik paket programı kullanılarak analiz edilmiştir. Araştırmaya katılan kız öğrenciler eğitim grubunda tüm ölçeklerin alt boyutlarında artışlar göstermiştir. Ayrıca kadınlar için yaşam kalitesi alt boyutları, çok boyutlu kısa öz kontrol ölçeğinin başlangıç alt boyutu ve fiziksel kendini savunma ölçeğinin tehlikeli fiziksel saldırı alt boyutlarında anlamlı farklılıklar gözlenmiştir. Kontrol grubunda ise yaşam kalitesi ölçeğinin ruh sağlığı alt boyutunda, çok boyutlu kısa öz kontrol ölçeğinin her iki alt boyutunda ve basit fiziksel saldırı alt boyutunda anlamlı düşüşler gözlendi. Sonuç olarak altı haftalık taekwondo eğitiminin sedanter kadınların özdenetim, yaşam kalitesi ve kendini savunma becerileri üzerinde olumlu bir etkisi olduğunu göstermiştir.

Anahtar Kelimeler: *Kendini kontrol etme, yaşam kalitesi, kendini savunma*

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INTRODUCTION

The physiological effects of physical activity are wide-ranging and impact all body systems. The health benefits of any type of physical activity are well known (Garber et al., 2011; Wen et al., 2011). The importance of regular physical exercise in preventing diseases and maintaining a healthy lifestyle is emphasized (Brown et al., 2012). Various physical fitness programs have been developed to reduce the risks caused by inactivity, instill exercise habits in people, and capture their interest (Çiçek et al., 2017). There are many factors that motivate individuals to engage in physical activity. These include reasons such as staying healthy, looking good, social interaction, popularity, losing weight, alleviating depression or anxiety, body image, reducing disease risk, self-control, self-defense, and quality of life (Allender et al., 2006; Alemdağ et al., 2016). In fact, all of these reasons for participation are aimed at achieving a better quality of life.

The term "health-related quality of life" refers to the physical, psychological, and social dimensions of health, which are seen as different areas influenced by a person's experiences, beliefs, expectations, and perceptions (Erbaydar et al., 2011). Health-related quality of life can be defined as "the perceived well-being of an individual in the physical, mental, and social domains of health and how well they function in life." Quality of life is a broad concept that goes beyond personal health status and includes overall well-being. It can also be defined as "the satisfactory social situation an individual achieves within the limits of their perceived physical capacity" (Bowling, 1993).

Quality of life is broadly defined as a combination of physical, mental, and social health. To achieve better quality of life, a high level of self-control is required (Cebi et al., 2016; Karadağ et al., 2024). Self-control, which refers to an individual's ability to regulate their behaviors, emotions, and thoughts, is a key factor that directly influences quality of life. High self-control allows individuals to develop healthy habits, manage stress and anxiety, handle social relationships more effectively, and lead a more balanced life, thereby enhancing their quality of life (Özatman et al., 2024). Taekwondo, a sport practiced for self-control and self-defense, is known to provide physical, physiological, psychological, and life skill benefits, as it develops abilities such as strength, endurance, flexibility, coordination, concentration, goal-setting, decision-making, self-defense, self-esteem, control, quality of life, discipline, and more, distinguishing it from other martial arts (Nair, 2020; Koçyiğit et al., 2022).

Although the health benefits of all types of physical activity in women are well-documented in the literature, the effects of taekwondo training on women's quality of life, self-control, and self-defense levels remain unclear. In light of this, the aim of this study is to examine the effects of six weeks of taekwondo training on female students' self-control, quality of life, and self-defense levels.

METHOD

The research was conducted in accordance with the pre-test–post-test control group model, a prominent experimental design within the domain of quantitative research (Karasar, 2017). The study was conducted in accordance with the ethical standards set forth in the Helsinki Declaration and approval was obtained from the Turkey Gümüşhane University Scientific Research Ethics Committee, protocol number 2024/2, decision number e-95674917-108.99-239802, approved on 21/02/2024.

Research group (Population-sample)

In determining the research group, the 'Easily Available Sampling' method was employed. The study sample comprised sedentary female university students actively enrolled at Turkey Gümüşhane University during the 2023-2024 academic year. The research group was obtained using the G*Power (version 3.1.9.3, Germany) power analysis programme. A theoretical power analysis was conducted using the 'ANOVA: Interaction between repeated measures' test (alpha value = 0.05 and test power (1-beta value) = 0.80, real power: 0.89, partial eta squared (η 2p) = 0.30) (Faul et al., 2007). It was thus determined that a minimum of 14 sedentary womens should participate in the study for each group. To preclude potential issues, each group comprised 18 participants. The participants were divided into two groups, designated the Exercise Group (EG) and the Control Group (CG), through the application of a simple random allocation method. The experimental group engaged in taekwondo training, whereas the control group did not receive any training.

Table 1. Descriptive information

		Exercise group (n:18)	**Control group (n:18)**
Height (cm)		161,72±5,84	163,22±5,14
Weight (kg)		56,72±8,57	59,28±5,77
Age (Year)		21,5±1,34	21,72±1,32
Income Status	Low	5	10
	Medium	13	8
Adequate nutrition	Yes	8	5
	No	10	13
Smoking	Yes	5	7
	No	13	11
Disease status	Yes	3	5
	No	15	13

The exercise group (EG) comprised female students with an average age of 21.5±1.34 years, height 161.72±5.84 cm and body weight 56.72±8.57 kg. The control group (CG) consisted of female students with an average age of 21.72±1.32 years, height 163.22±5.14 cm and body weight 59.28±5.77 kg.

Taekwondo exercise programme

The study programme involved the participants engaging in Taekwondo kyorugi (basic and combined strokes) exercises for a duration of 60 minutes per day, three days per week, over a period of six weeks. In the literature, it has been established that a minimum of 6-12 weeks, with a frequency of at least 3 days per week, is a crucial period for development (Hudelmaier et al., 2010). Accordingly, a period of six weeks was deemed appropriate for the duration of the study. The exercise programme was structured into three phases, based on the input of three Taekwondo experts. The warm-up phase comprised a 5-minute low-intensity running routine, followed by a 10-minute series of exercises designed to enhance agility and coordination. These included two-step, side step, diagonal step, two feet, single leg jump, squat jump, high knees (x10), single knee, cut kick, one step back, and two step back. In order to prevent the onset of muscular tension and to facilitate relaxation of the body, a stretching phase comprising five minutes of dynamic stretching was conducted. The principal phase was administered to the participants on three days of the week (Tuesday, Thursday and Saturday) over a period of 60 minutes. In accordance with the six-week programme, the fundamental kicking techniques, including Apchagi, Dolryeo chagi, Naryeo chagi, Ggeulousi apchagi, Apbal dolryeochagi, Jump neryeo jjikgi, Neryeo jjikgi, Dolgae chagi, Naraechagi, Punch, Dwitchagi, Dwihooryeo chagi, were taught during the initial four weeks. Subsequently, over the final two weeks, combined stroke training was provided. Each exercise session was conducted between 19:00 and 20:30 in the evening. Following a five-minute period of rest, a cool-down phase was initiated.

Table 2. Six-week programme

1 Week	Apchagi, Dolryeo chagi, Naryeo chagi, (Each set of movements was repeated 3 times for 4 min. Rest was given for 1 min between each set.)
2 Week	Ggeulousi apchagi, Apbal dolryeochagi, (Each set of movements was repeated 3 times for 4 min. Rest was given for 1 min between each set.)
3 Week	Jump neryeo jjikgi, Neryeo jjikgi, (Each set of movements was repeated 3 times for 4 min. Rest was given for 1 min between each set.)
4 Week	Dolgae chagi, Naraechagi, Punch, Dwitchagi, Dwihooryeo chagi, (Each set of movements was repeated 3 times for 4 min. Rest was given for 1 min between each set.)
5 Week	Combined stroke training (Each set of combined movements was repeated 3 times for 4 minutes. 1 minute rest was given between each set).
6 Week	Combined stroke training (Each set of combined movements was repeated 3 times for 4 minutes. 1 minute rest was given between each set).

In the post-exercise cooling phase, static stretching exercises were performed for a period of five minutes. This was done to prevent the potential for muscle contraction and tension, which could otherwise lead to injury risks. The stretching exercises were conducted in conjunction with breathing exercises, which were designed to normalize breathing and pulse after exercise.

Data collection tools

The female participants in the study were initially apprised of the study's general objective and the manner in which the scale forms were to be completed. The participants were requested to respond to the questions in an honest and individual manner, reflecting their behaviours in their everyday lives. Furthermore, the participants were informed that all data obtained from the questionnaire would be kept strictly confidential and would be used solely for research purposes. Scale applications were collected from the participants before and after the six-week training period by face-to-face interviews.

Personal Information Form: In our study, 7 questions such as age, height, body weight, income level, adequate nutrition status, smoking and disease status etc. were asked.

The quality of life scale (QOLS)

The Short Form-36 (SF-36) was developed by Ware et al. (1995) as a means of measuring quality of life. The SF-12 Quality of Life Scale was constructed by selecting 12 items from eight subheadings of the SF-36. A Turkish validity and reliability study was conducted by Soylu and Kütük. (2022). The scale enquiry concerns the individual's functional status, well-being and general health perception. The responses to questions pertaining to physical and emotional status are dichotomous (yes/no), whereas other questions employ a Likert-type scale with options ranging from 3 to 6. The Mental Component Summary (MCS) score is derived from the Mental Health, Emotional Role, Social Functioning, and Energy subcategories, while the Physical Component Summary (PCS) score is calculated from the Physical Role, Physical Functioning, General Health, and Body Pain subcategories. Scoring is on a scale of 0 to 100. A higher score is indicative of superior health status. The Cronbach's alpha coefficient of the SF-12 Short Health Scale was calculated as α:0.73 for the physical subscale and α:0.72 for the mental subscale (Soylu & Kütük, 2022). The alpha coefficient of these two sub-dimensions, which explained 57.48% of the total variance, was calculated as 0.555 for the physical subscale and 0.698 for the mental subscale. The SF-12 scale was scored on the OrthoToolKit website.

The multidimensional self-control scale (MSCS)

The scale developed by Nielsen et al. (2020) and subsequently adapted into Turkish by Koç et al. (2023) comprises eight items and two sub-dimensions, namely Initiation and Inhibition. The Initiation sub-dimension comprises 2, 4, 5 and 8 items, while the Inhibition sub-dimension consists of one, three, six, and seven items. In order to ensure consistency and comparability, items 1, 3, 5 and 7 have been reverse scored. The scale is of the five-point Likert type. In the present study, the alpha coefficient was calculated as 0.661 for the initiation subscale and 0.611 for the inhibition subscale. It was determined that the scale has highly reliable results of $0{,}60 \leq \alpha < 0{,}80$.

Physical self-defense scale for women

The scale developed by Uyar (2022) comprises 12 items and two sub-dimensions: self-defense against dangerous physical attacks and self-defense against simple physical attacks. The scale does not include any items that can be reverse scored. The lowest possible score that can be attained on this five-point Likert-type scale, comprising two sub-dimensions and 12 items, is 12, while the highest score is 60. The initial sub-dimension, encompassing self-defense against dangerous physical attacks, comprises six items. A high score within this dimension indicates that women possess elevated levels of self-defense against physical attacks that they perceive as more dangerous. The remaining sub-dimension assesses women's capacity for self-defense in the context of physical attacks that they perceive as less dangerous, comprising six items. A high score in this sub-dimension indicates that women possess a robust capacity for self-defense against physical attacks that they perceive as less dangerous. In this study, the alpha coefficients were 0.894 for the dangerous assault sub-dimension and 0.807 for the simple assault sub-dimension. It was determined that the scale had very high reliability results such as $0.80 \leq \alpha < 1.00$.

Analysing the data

The data obtained in the study were analysed using the SPSS 21.0 statistical package programme. The variables were evaluated with the Kolmogorov-Smirnov test, following the control of the normality and homogeneity of variances prerequisites.

Table 3. Normal distribution, validity and reliability analyses of the scales

(n:36)	Kolmogorov-Smirnov	Number of items	X	S.S	α	p.	Kurtosis	Skewness
Quality of Life Scale (QOLS) (α:,720)	Physical	4	44.31	7.88	0.555	0.200*	-0.495	-0.420
	Mental	8	43.16	9.77	0.698	0.200*	-0.295	-0.464
The Multidimensional Self-Control Scale, MSCS (α:,827)	Inhibition	4	13.31	2.67	0.611	0.021	0.310	-0.007
	Initiation	4	11.06	3.7	0.787	0.001	0.736	-0.397
Physical Self-Defense Scale for Women, (α:,917)	Dangerous physical	6	15.69	5.89	0.894	0.200*	0.846	-0.158
	Simple physical	6	20.11	4.79	0.807	0.005	0.343	0.599

It was observed that the deviations from normality of the scores obtained by the participants from the pre-exercise (PE) and post-exercise (PO) quality of life scale, Multidimensional Brief Self-Control Scale and Physical Self-defense Scales for Women were significant at the 0.05 level. Upon examination of the normal distribution curves, it was observed that the deviations from normality fell within the range of ±1. In the existing literature, Tabachnick and Fidell'e (2015) interpreted the fact that these values are in the range of ±1.5 as not excessive deviations from normality. In light of the aforementioned information, the researcher concluded that the data exhibited a normal distribution, and thus, normal distribution tests were conducted. The variables were expressed using mean ± standard deviation values. In the analysis of the groups, a paired approach was employed. The statistical tests employed were the paired samples T-test for dependent groups and the T-test for two independent groups. Furthermore, in the comparison of paired groups, effect levels were determined in accordance with the formula proposed by Cohen (2013) for calculating effect sizes. This formula is represented as (M2 - M1)/SD pooled. The overall reliability of the study was evaluated using the Cronbach alpha coefficient. The interpretation of Cronbach alpha values is as follows: $0.40 \leq \alpha < 0.60$ indicates low reliability, $0.60 \leq \alpha < 0.80$ indicates highly reliable results, and $0.80 \leq \alpha < 1.00$ indicates highly reliable results (Tavşancıl, 2014).

FINDINGS

Table 4. Comparison of pre- and post-training values of the group

			Exercise group (n:18)					Control group(n:18)					p
			X	S.d.	e.s	%	p^1	X	S.d.	e.s	%	p^2	
QOLS	Physical	Pre	49.42	4.94	0.81	6.50	0.007*	39.20	6.93	0.02	-0.04	0.785	0.008*
		Post	52.63	2.58				39.04	6.28				
	Mental	Pre	42.41	9.94	0.63	27.63	<0.001**	43.91	9.81	0.24	-4.64	0.035*	<0.001**
		Post	54.13	3.81				41.87	7.29				
MSCS	Inhibition	Pre	15.06	2.55	0.24	4.05	0.398	11.56	1.29	0.36	-4.32	0.008*	0.135
		Post	15.67	2.43				11.06	1.47				
	Initiation	Pre	13.11	4.03	0.56	15.26	0.034*	9.00	1.75	0.20	-3.66	0.010*	0.012*
		Post	15.11	3.05				8.67	1.50				
PSDSW	Simple Physical	Pre	23.00	5.18	0.49	8.70	0.075	17.22	1.63	0.07	-0.06	0.430	0.144
		Post	25.00	2.59				17.11	1.53				
	Dangerous Physical	Pre	19.39	6.08	0.44	12.76	0.05*	12.00	2.35	0.29	5.08	0.045*	0.05*
		Post	21.83	5.08				12.61	1.88				

p1: Exercise group pre-post training comparison, p2: Control group pre-post training comparison, p3: P1: Exercise and Control group pre-post training comparison, QOLS Quality of Life Scale, MSCS Multidimensional Self-Control Scale, PSDSW; Physical Self-Defense Scale for Women, e.s.: effect size, *p<0,05, **p<0,001

The training group of female students participating in the study exhibited increases in the sub-dimensions of all scales. However, significant differences were observed in the quality of life sub-dimensions, the initiation sub-dimension of the multidimensional brief self-control scale, and the dangerous physical attack sub-dimensions of the physical self-defense scale for women. In the control group, significant decreases were observed in the mental health sub-dimension of the quality of life scale, as well as in both sub-dimensions of the multidimensional brief self-control scale and in the simple physical assault sub-dimensions of the physical self-defense scale for women.

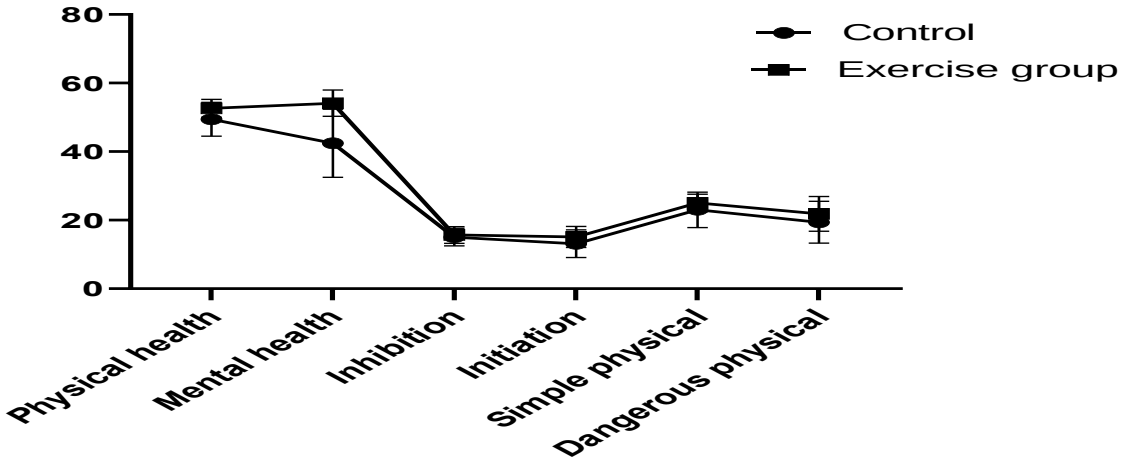

Figure 1. Comparison of difference values

A comparison of the pre- and post-training values revealed notable differences between the training and control groups in all dimensions of quality of life, the multidimensional brief self-control scales, and the simple physical assault sub-dimension of the physical self-defense scale for women. While the training group exhibited increases in all dimensions except the dangerous physical attack sub-dimension, the control group demonstrated significant decreases in all dimensions.

DISCUSSION AND CONCLUSION

The principal objective of the present study was to examine the impact of six weeks of taekwondo training on self-control, quality of life and self-defense capabilities in sedentary women's. To the best of our knowledge, this is the inaugural study to examine the impact of taekwondo training on self-control, quality of life and self-defense capabilities in sedentary women's. The most important findings of the present study were that 6-week taekwondo

training increased self-control, quality of life and self-defense skills in sedentary women. The inclusion of taekwondo training in the educational curriculum can facilitate the development of self-control, quality of life and self-defense skills among female students.

Taekwondo (TKD), an Olympic sports branch, is a branch that is performed by performing different movement forms in a disciplined manner in harmony by synchronizing a peaceful mind and body. These unique features turn into a way of life by ensuring the balanced development of the individual (TKD, 2022). Unlike other martial arts, participating and practicing TKD provides physical, physiological, psychological and life skill benefits as it improves strength, endurance, flexibility, coordination, concentration, goal setting, decision making, self-defense, self-esteem, control, quality of life, discipline, etc. (Burke et al., 2007; Nair, 2020). Therefore, it can be said that TKD develops the individual cognitively, physically, emotionally and socially (Lakes et al., 2013).

The primary findings of this study indicate that the quality of life, self-control, and self-defense levels of the taekwondo training group, comprising sedentary women who participated in the study, exhibited an improvement, whereas the control group demonstrated a decline.

Various studies examining the impact of Taekwondo training on quality of life have revealed that this sport positively affects physical, psychological, and social domains. Cromwell et al. (2007) highlighted that Taekwondo not only serves as a physical exercise but also enhances psychological factors such as discipline, patience, and mental resilience, improving overall quality of life. Lakes and Hoyt (2004), in their study investigating the psychosocial effects of Taekwondo on children, reported that the sport significantly improves skills like self-confidence, self-discipline, and stress management, contributing positively to children's overall quality of life. Kim et al. (2015) examined the effects of Taekwondo training on female university students' physical health and quality of life, reporting that regular Taekwondo training improves muscle strength, flexibility, and cardiovascular health, thereby enhancing overall quality of life. Fong and Ng (2011) studied the impact of Taekwondo on older adults, finding that it improves balance, flexibility, and general quality of life, as well as psychosocial factors such as social participation and self-esteem. Burke et al. (2007), in their research on martial arts like Taekwondo, found that these sports not only promote physical health but also have significant effects on mental health and quality of life, particularly in reducing stress and enhancing self-expression and self-control. Jung et al. (2017) found that regular Taekwondo training improves physical health parameters such as muscle strength,

flexibility, and cardiovascular endurance, all of which contribute to a higher quality of life. Ziaee et al. (2012), in their study on young males, demonstrated that regular Taekwondo training reduces levels of depression, anxiety, and stress, thereby enhancing psychological well-being and overall quality of life.

Kim et al. (2014) found that Taekwondo training positively impacts social well-being by enhancing social skills, teamwork, and social participation. These social interactions contribute to improved quality of life. Douris et al. (2015) reported that regular Taekwondo training improves physical fitness in middle-aged individuals, strengthens resilience to stress, and has positive effects on quality of life. Most of these studies conclude that Taekwondo contributes to overall quality of life by promoting not only physical but also psychological and social well-being. However, more research is needed on specific populations, particularly women. It can be postulated that the reduction in the control group was a consequence of the participants' inability to allocate time for their own benefit due to the demands of the academic process. It can be observed that a all of exercises have a positive effect on the individual, with this exercise offering the opportunity to set aside time for personal pursuits.

Studies examining the effects of Taekwondo training on self-defense show that the sport improves personal defense skills and instills a sense of security in individuals. Kim et al. (2014) investigated the impact of Taekwondo on developing basic self-defense skills, reporting that Taekwondo training enhances participants' physical defense abilities and leads to improvements in speed, strength, and technique during practice. It also helps individuals feel more secure when under threat. Cho et al. (2017), in their study on how Taekwondo education develops physical and mental self-defense skills in students, found that Taekwondo techniques raise both physical and mental awareness regarding self-defense. They also reported that Taekwondo training increases participants' awareness of self-defense and helps them develop strategic approaches to potential dangerous situations. Selucik and Dilek (2020) examined the effects of Taekwondo on self-defense and aggression levels, reporting that individuals practicing Taekwondo showed reduced tendencies toward physical aggression and improved self-defense skills. In their 2013 study examining the effects of Taekwondo on women, Ghorbanzadeh et al. found that Taekwondo training not only teaches women physical self-defense techniques but also boosts their self-confidence. Women reported that through Taekwondo, they enhanced their ability to handle dangerous situations while feeling psychologically stronger. Kim et al. (2021) indicated that Taekwondo could positively impact participants' psychosocial factors. Lakes and Hoyt (2004) discovered that Taekwondo improves

not only physical defense but also emotional and mental resilience, enabling individuals to develop both self-defense and the ability to remain calm under stress. Additionally, improvements in self-control levels were reported. The common finding across Taekwondo training studies in the literature is that it enhances self-defense skills, equips individuals with the ability to respond safely and strategically to physical attacks, and strengthens key psychological factors such as mental resilience, self-confidence, and self-control.

In conclusion, the studies demonstrate that 6 weeks Taekwondo training positively contributes to individuals' quality of life, both physically and psychologically. Taekwondo has significant effects on self-esteem, self-control, and overall quality of life. It is recommended that female university students engage in Taekwondo exercises during their academic terms.

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