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Effect Of Agility Training On Reaction Time In Taekwondo Players

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ABTRACT

As a martial art discipline that serves to increase performance, Taekwondo calls for a high level of agility and lower limb strength. The aim of the study was to evaluate the impact of a 6-week agility training program on National level Taekwondo players' reaction time. The purpose of this study was to investigate how agility training affected Taekwondo' reaction . Twenty players who were actively involved in taekwondo took part in the study. They were divided into two groups with n=12 in each group. Group 1 was given agility training whereas Group 2 was the controlled group All the assessed variables showed significant changes (P <0.05) in the Group 1 whereas in Group 2 (controlled group) showed no appreciable alterations . The pre-test and post-test values for the agility was statistically significant..

Keywords: agility, Taekwondo, reaction time

1. Introduction

Taekwondo is a martial art sport requiring high level of agility, lower limb strength as it helps improve performance in activities. The purpose of the study was to determine the effect of a 6-week agility training program on reaction time of taekwondo players.

The Korean term "Tae," which means "to kick" or "smash with the feet," is the source of the English phrase "Taekwondo." "Do" denotes "way" or "method," while "Kwon" implies "punching" or "destroying with the hand or fist." (Liner KL, 2007)

Hence, Taekwondo is a method of unarmed combat for self-defense that includes the deft use of punching, jumping kicks, blocking, dodging, and parrying motions with the hands and feet. Combat sport taekwondo emphasizes dynamic footwork and kicking skills. Taekwondo is a martial art that evolved into its "current" form of self-defense by fusing numerous other martial arts traditions that were practiced in Korea.

Due to the need to defend against attacks from all sides of the body, martial arts like taekwondo and others directly relate to agility, rhythm, response time, and balance (Ferrigno JG, 2005).

The capacity to shift directions quickly as well as the ability to change directions quickly and accurately have historically been used to characterize agility. Sheppard and Young (2006) offer a new definition of agility that is "a rapid whole-body movement with change of velocity or direction in response to a stimulus" and links trainable physical attributes like strength, power, and technique to trainable cognitive attributes like visual scanning strategies, visual scanning speed, and anticipation.

Testing for agility is typically limited to measures of speed, change of direction, or cognitive abilities like anticipation and pattern recognition. Via neuromuscular conditioning and neuronal adaptation of the muscle spindle, Golgi-tendon organs, and joint proprioceptors, agility training is assumed to constitute a reinforcement of motor programming. During offensive and defensive skills, an athlete's ability to jump is frequently a determining factor in performance.

Typically, only assessments of speed, change of direction, or cognitive skills like anticipation and pattern recognition are used to assess agility. Agility training is thought to act as a reinforcement of motor programming through neuromuscular conditioning and neuronal adaptation of the muscle spindle, Golgi-tendon organs, and joint proprioceptors. The ability of an athlete to jump is frequently a deciding element in performance during offensive and defensive skills.

2. Subjects and Methods

A total of 24 participants were included in the study in which 12 were the G1 that went through a agility training program while 12 were in the G2 which was the controlled group.. Pre data was collected before starting the training and after six weeks post data were collected of both groups.

Before the participants signed the permission form and began the test, all testing and training processes, benefits, and potential hazards of the study were thoroughly explained to them. Participants in this study had to meet the following criteria to be included: they had to be free of current musculoskeletal issues, such as lower limb fractures and sprains/strains, they had to have sustained no recent lower limb injuries and they had to be healthy overall.

Table:1 Six weeks agility training Program for Group-1

Training week	Training volume (foot contacts)	Plyometric Drill	Sets × Reps	Training Intensity
Week 1 (3 days per week; an alternate day)	90 (2-3 min rest intervals)	Side to side ankle hops	2×15	Low
		Standing jump and reach	2×15	Low
		Front Cone Hops	5×16	Low
Week 2 (3 days per week; an alternate day)	120 (2-3 min rest intervals)	Side to Side ankle hops	2×15	Low
		Standing long Jump	5×6	Low
		Lateral jump over barrier	2×15	Low
		Double leg hops	5×6	Low
Week 3 (3 days per week; an alternate day)	120 (2-3 min rest intervals)	Side to Side ankle hops	2×12	Medium
		Standing long jump	4×6	Medium
		Lateral jump over barrier	2×12	Medium
		Double leg hops	3×8	Medium
		Lateral cone hops	2×12	Medium
Week 4 (3 days per week; an alternate day	140 (2-3 min rest intervals)	Diagonal cone hops	4x8	Medium
		Standing long jump with lateral sprint	4x8	Medium
		Lateral cone hops	2x12	Medium
		Single leg bounding	4x7	Medium
		Lateral jump single leg	4x6	Medium
Week 5 (3 days per week; an alternate day	140 (2-3 min rest intervals)	Diagonal cone hops	2x7	High
		Standing long jump with lateral sprint	4x7	High
		Lateral cone hops	4x7	High
		Cone hops with 180-degree turn	4x7	High
		Single leg bounding	4x7	High
		Lateral jump single leg	2x7	High
Week 6		Diagonal cone hops	2x12	High
		Hexagon drill	2x12	High

(3 days per week; an alternate day)	120 (2-3 min rest intervals)	Cone hops with change of direction sprint	4x6	High
		Double leg hops	3x8	High
		Lateral jump single leg	4x6	High

After stretching the participants performed side-to-side ankle hops, standing jumps and reaches, front cone hops, and low intensity sets with a minimum of two sets of fifteen.

Results

Effect of Agility training on reaction time

Group	Data	N	Mean ± SD	SED	Df	t-test	p-value
Group-2	Baseline Data	12	4.29 ± 0.76	0.359	11	1.074	0.283
	Post Data	12	5.33 ± 0.54	0.357	11		
Group-1	Baseline Data	12	4.77 ± 0.73	0.387	11	4.701	0.001
	Post Data	12	7.51 ± 0.77	0.408	11		

Table:2 Statical analysis of pre and post data of both groups

It was observed that the group-2 baseline data and post data had no significant difference while in Group-1 the significant difference is observed in the baseline data and post data with the value of 0.001. It should be noted that Group I had shown a positive significance due to the effect of agility training.

There was a significant difference between group-1 and group-2 in reaction time.

3. Discussion

Significant improvements in reaction times were observed, which was consistent with a study by Büyükipekci and Taşkin from 2011, which highlighted the importance of agility in moving one's entire body quickly and correctly in response to a stimulus and the necessity of reaction times for taekwondo players to make quick decisions in attack and defense. This study also refers to the idea that a player's agility traits will develop if their reactions are quick, which is another potential explanation for the outcomes of our study.

The analysis of the different sport-specific skills that were examined in the study was consistent with what has been said in earlier studies. For example, Monoem,2015 found that athletes who practiced a lot for reaction time to visual stimuli were more likely to win competitions in taekwondo, where this skill is a key neuromotor factor. In their study, Chung and Ng (2012) found that professional taekwondo practitioners have better neuromotor ability in both large and small muscles, as well as faster reactions to sport-specific stimuli, which suggests a generalized training effect across muscles and may also account for the results of our study.

In a prior study on agility training, agility training appeared to generate the most desirable effect on muscle reaction time; complicated agility training can be used to improve explosive muscle power and dynamic athletic performance.

As a result, in this study, participants who engaged in agility training were able to considerably enhance their reaction time. Training in agility was found to be positively correlated with improvements in the variable. Taekwondo performers need fast movements and benefit from this increase in agility.Different sport-related variables can be improved with regular involvement in an agility training program.

4. Conclusion

The findings indicate the advantages agility training can have on performance that are quite positive. Players can use agility to not only break up the monotony of training, but they can also enhance certain skills as they learn to become more agile. The findings also suggest that agility gains can be made in as short as six weeks of training, which can be helpful for taekwondo performers in their final preparation period before in-season competition. Based on these results, it can be concluded that 6 weeks of agility training significantly improved the national taekwondo competitors' agility and reaction time.

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