

# BUILDING STANDARDS TO EVALUATE LEG TECHNIQUE SPEED STRENGTH FOR THIRD-YEAR MALE TAEKWONDO STUDENTS MAJORING IN SPORTS TRAINING AT BAC NINH SPORTS UNIVERSITY

Ly Duc Truong<sup>(1)</sup>

## Abstract:

Study and select the criteria and build standards to evaluate the speed strength of leg technique for male Taekwondo students to use as a basis for assessing the level of practicing leg technique speed strength of male Taekwondo students as well as assessing the training process for male Taekwondo third-year students majoring in sports training at Bac Ninh Sports University.

**Keywords:** Standards, speed strength, leg technique, Taekwondo students, Sports Training department, Bac Ninh Sports University.

## INTRODUCTION

Taekwondo was introduced to Vietnam in 1962, with the attention of the country, Taekwondo has become a key sport and achieved high achievements in the world conventions as well as in Southeast Asia, some must be mentioned are Tran Quang Ha Gold medal Seagames 16; Tran Hieu Ngan Silver medal Olympic 2000; Chau Tuyet Van Gold medal Global 2010, 2011, 2013, ... With more than 60 years of tradition, Bac Ninh Sports University has trained many physical education teachers with good theoretical qualifications and high practical skills that meet the industry and social requirements. Currently, inspection and technical evaluation of Taekwondo leg technique speed strength for students in the university are mainly based on pedagogical tests, experience-based standards, subjectivity and emotions of the teachers.

Through research, until now, the research and application of scientific and technical equipment has not had any topic that uses the functions of 'M103 impulse meter' to check and evaluate Taekwondo leg technique speed strength. Therefore, our thesis put M103 as a mean of support to ensure accuracy, objectivity

and scientificness.

## RESEARCH METHODS

The research process used the following research methods: Methods of analyzing and synthesizing documents; Method of interviewing; Method of pedagogical observation; Method of pedagogical examination; Method of biomechanical examination and method of statistical mathematics.

The study on the use of equipment for measuring mechanical parameters of techniques in martial arts was conducted on the M103 impulse wireless device produced and transferred to Bac Ninh Sports University by the Institute of Materials Science, through the mechanical parameters: reaction time  $T$  (ms); Collision time  $Dt$  (ms); Maximum force  $F$  (KG); Momentum  $P$  (km.s) and SQ Power Index. Observations were made on 03 leg techniques: Round kick (Dollyo chagi); Front kick (Apchagi) and Back kick (Dwichagi).

The study was conducted on 11 students specialized in Taekwondo Course 52, Bac Ninh Sports University. The survey was conducted at the end of the first semester, school year 2018-2019.

(1) PhD, Bac Ninh Sports University; Email: lidechang1976@gmail.com

**RESULTS AND DISCUSSION**

**1. Study and select standards to evaluate leg technique speed strength for male third-year Taekwondo students majoring in Sports Training at Bac Ninh Sports University**

We proceed to select the standards to evaluate leg technique speed strength for male third-year Taekwondo students, Sports training department, Bac Ninh Sports University through analyzing the subject curriculum, referring to documents, interviewing Taekwondo lecturers and Taekwondo experts, interviewing extensively with questionnaires and determining the reliability and informativeness of the tests. The results selected 07 pedagogical standards and 05 measurement parameters on SM103 impulse measuring device to evaluate leg technique speed strength for students, including:

General speed strength standard: 20m running with standing start (s); 30m ziczac running (s); Long jump on the spot (cm) and Speed rope skipping (times)

Professional speed strength standard: Round kick on the spot with kicking target 10s (times); Round kick 2 opposite targets 10s (times); Tie elastic band on back leg and round kick the target 10 seconds (time).

The standards on SM103 device include: Reaction time T (ms); Collision time Dt (ms); Maximum force F (KG); Momentum P (km.s) and SQ Power Index. Observations were made on 03 leg techniques: Round kick (Dollyo chagi); Front kick (Apchagi) and Back kick (Dwichagi).

**2. Building standards to evaluate leg technique speed strength for male 3rd year Taekwondo students majoring in Sports Training, Bac Ninh Sports University**

**Table 1. Standards for classifying leg technique speed strength for specialized third-year male students, Sports Training department, Bac Ninh Sports University on SM103 device**

No	Classify	Standards	Good	Fair	Average	Weak	Poor
1	<b>General speed strength standards</b>	20m running with standing start (s)	<3.09	3.10-3.25	3.26-3.55	3.56-3.71	>3.72
2		30m ziczac running (s)	<6.07	6.08-6.26	6.27-6.64	6.65-6.83	>6.83
3		Long jump on the spot (cm)	>263.72	252.97-263.71	243.47 - 252.96	238.72-243.46	<238.72
4		Speed rope skipping (times)	>117.62	109.41-117.61	92.99-109.40	84.78-92.99	<84.78
5	<b>Professional speed strength standards</b>	Round kick on the spot with kicking target 10s (times)	>25.6	23.75-25.6	05.20-23.74	18-18-20.04	<18.2
6		Round kick 2 opposite targets 10s (times)	>22.6	20.65-22.6	16.75-20.64	14.8-16.75	<14.98
7		Tie elastic band on back leg and round kick the target 10 seconds (time)	>21.22	19.66-21.22	15.54-19.65	14.98-16.53	<14.98

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**Table 2. Standards for classifying leg technique speed strength for specialized third-year male students, Sports Training department, Bac Ninh Sports University on SM103 device**

No.	Standards	Classify				
		Poor	Weak	Average	Fair	Good
<b>Round kick (dollyo chagi)</b>						
1	Reaction time T (ms)	<357.75	357.75-376.16	376.16-412.97	412.97-431.38	> 431.38
2	Power using time Dt	<37.86	37.86-39.70	39.70-49.38	43.38-45.22	> 45.22
3	Maximum force F	<190.38	190.38-200.16	200.16-219.71	219.71-229.49	> 229.49
4	Momentum ( $P = F \times t$ )	<7825.41	7825.41-8273.05	8273.05-9168.35	9168.35-9615.99	> 9615.99
5	Power index ( $SQ = F \times P / T / 100$ )	<41.97	41.97-44.19	44.19-48.61	48.61-50.83	> 50.83
<b>Front kick (Apchagi)</b>						
1	Reaction time T (ms)	<370.72	370.72-389.74	389.74-424.79	427.79-446.81	> 446.81
2	Power using time Dt	<16.65	16.65-17.46	17.46-19.07	19.07-19.88	> 19.88
3	Maximum force F	<207.10	207.10-217.71	217.71-238.94	238.94-249.55	> 249.55
4	Momentum ( $P = F \times t$ )	<3745.11	3745.11-3957.73	3957.73-4382.98	4382.98-4595.60	> 25.50
5	Power index ( $SQ = F \times P / T / 100$ )	<21.09	21.09-22.19	22.19-24.40	24.40-25.50	> 25.50
<b>Back kick (Dwichagi)</b>						
1	Reaction time T (ms)	<300.10	300.10-315.60	315.60-346.60	346.60-362.10	> 362.10
2	Power using time Dt	<17.34	17.34-18.17	18.17-19.84	19.84-20.67	> 20.67
3	Maximum force F	<174.43	174.43-183.31	183.31-201.09	201.09-209.97	> 209.97
4	Momentum ( $P = F \times t$ )	<3286.09	3286.09-3469.42	3469.42-3836.10	3836.10-4019.44	>4019.44
5	Power index ( $SQ = F \times P / T / 100$ )	<19.16	19.16-20.18	20.18-22.23	22.23-23.25	> 23.25



Introduced into Vietnam relatively late but Taekwondo has grown rapidly (photo by: upes1)

Table 3. Score board for evaluating leg technique speed strength for specialized third-year male students, Sports Training department, Bac Ninh Sports University

No.	Classify	Standards	10	9	8	7	6	5	4	3	2	1
1	<b>General speed strength standards</b>	20m running with standing start (s)	3.16	3.22	3.28	3.34	3.4	3.47	3.52	3.58	3.64	3.7
2		30m ziczac running (s)	5.54	5.71	5.88	6.05	6.22	6.39	6.56	6.73	6.9	7.07
3		Long jump on the spot (cm)	261	259	256	254	252	250	247	245	243	241
4		Speed rope skipping (times)	197	132	127	123	118	114	109	104	100	95
5	<b>Professional speed strength standard</b>	Round kick on the spot with kicking target 10s (times)	29	28	27	26	25	24	23	22	21	20
6		Round kick 2 opposite targets 10s (times)	25	24	23	22	21	20	19	18	17	16
7		Tie elastic band on back leg and round kick the target 10 seconds (time)	24	23	22	21	20	19	18	17	16	15

**Table 4. Score board for evaluating leg technique speed strength for specialized third-year male students, Sports Training department Bac Ninh Sports University on SM103 device**

Standards	Score									
	10	9	8	7	6	5	4	3	2	1
<b>Round kick (dollyo chagi)</b>										
Reaction time T (ms)	440.58	431.38	422.17	412.97	403.77	394.57	385.36	376.16	366.96	357.75
Power using time Dt	46.14	45.22	44.3	43.38	42.46	41.54	40.62	39.7	38.78	37.86
Maximum force F	234.38	229.49	224.6	219.71	214.82	209.94	205.05	200.16	195.27	190.38
Momentum (P = F × t)	9839.82	9615.99	9392.17	9168.35	8944.52	8720.7	8496.88	8273.05	8049.23	7825.41
Power index (SQ = F × P / T / 100)	51.94	50.83	49.72	48.61	47.51	46.4	45.29	44.19	43.08	41.97
<b>Front kick (Apchagi)</b>										
Reaction time T (ms)	456.33	446.81	437.3	427.79	418.28	408.77	399.25	389.74	380.23	370.72
Power using time Dt	20.28	19.88	19.47	19.07	18.67	18.27	17.86	17.46	17.06	16.65
Maximum force F	254.85	249.55	244.24	238.94	233.63	228.33	223.02	217.71	212.41	207.1
Momentum (P = F × t)	4701.91	4595.6	4489.29	4382.98	4276.67	4170.36	4064.05	3957.73	3851.42	3745.11
Power index (SQ = F × P / T / 100)	26.06	25.5	24.95	24.4	23.85	23.29	22.74	22.19	21.64	21.09
<b>Back kick (Dwichagi)</b>										
Reaction time T (ms)	369.85	362.1	354.35	346.6	338.85	331.1	323.35	315.6	307.85	300.1
Power using time Dt	21.08	20.67	20.25	19.84	19.42	19.01	18.59	18.17	17.76	17.34
Maximum force F	214.42	209.97	205.53	201.09	196.64	192.2	187.76	183.31	178.87	174.43
Momentum (P = F × t)	4110.1	4019.44	3927.77	3836.1	3744.43	3652.76	3561.09	3469.42	3377.75	3286.09
Power index (SQ = F × P / T / 100)	23.76	23.25	22.74	22.23	21.72	21.2	20.69	20.18	19.67	19.16

Before building the standards to evaluate the leg technique speed strength for students, we conducted a comparison of the students' difference in speed strength level by weight classes. If there is no difference between the results, we will develop common speed strength evaluating standards for all students. If the results have statistically significant differences,

we will develop separate training standards for each weight class. The results of comparison between <55kg and >55kg students did not show any statistically significant difference (P> 0.05) so during the process of the study, we will develop common evaluating standards for third-year male students.

In parallel with comparing differences



To effectively implement the techniques in Taekwondo, the development of speed power for athletes is essential (photo by: upes 1)

between weight classes, we conducted a test on standard distribution of the research subject. The results show that the distribution meets the standards ( $C_v < 10\%$ ) and the standard can be built on the basis of  $2\delta$  rule and C scale.

We conducted the development of standards to evaluate students' speed strength level on  $2\delta$  and classifying scores on a scale of C. The results are presented in Table 1 and Table 2.

On the basis of the standard classification table and score board, we built a synthetic score board to evaluate leg technique speed strength for male students. Results are presented in Table 5.

**Table 5. Synthetic score board for evaluating leg technique speed strength for specialized third-year male students, Sports Training department, Bac Ninh Sports University**

Classification of scores	Level of points
Good	$\geq 90$
Fair	70-89
Average	50-69
Weak	30-49
Poor	$\leq 29$

**CONCLUSION**

1. We have chosen 07 pedagogical indicators and 05 indicators on SM103 device (observed on 3 techniques Round Kick (Dollyo chagi); Front Kick (Apchagi) and Back Kick (Dwi chagi) ) to evaluate leg technique speed strength

for third-year male students specialized in Taekwondo, Sports Training department, Bac Ninh Sports University

2. We have developed 01 standard classification table, 01 score board and 01 synthetic score board to evaluate leg technique speed strength for third-year male students specialized in Taekwondo, Sports Training department, Bac Ninh Sports University

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