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Development Of A Technical Instrument For Kicks And Punches For Female Taekwondo Kyorugi Athletes Aged > 17 Years That Suits Competition And Training Needs

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Abstract

The aim of this research is to develop and compile a valid and reliable taekwondo technical skill test instrument for female senior kyorugi athletes > 17 years old that suits the needs in competitions and training, and to compile and develop a test instrument that has norms and standard value conversions. The development method in this research is using Planning, Production, and Evaluation (PPE) development research. The subjects in this research were 20 people who had participated in inter-regional, provincial and even national competitions. The data collection technique in this research uses design (Richey and Klein, 2009). (1) Planning, (2) Production, and (3) Evaluation. This research produces a product, namely in the form of a series of technical manuals on taekwondo technical skills test instruments that are valid and reliable for female senior kyorugi athletes > 17 years old which are in accordance with the needs in competitions and training and norms as well as standard value conversions, which consist of (1) SOP instructions for implementing techniques for testing and measuring kicks in Peta Chagi, (2) SOP instructions for implementing techniques for testing and measuring Pyejoek kicks, and (3) instructions for implementing techniques for testing and measuring punches (Jireugi or Jumoek).

Keywords: Taekwondo techniques, test instrument development, Kyorugi

Introduction

Sport is a form of physical and psychological activity that is very useful for maintaining a person's health and mental health. Sport is a series of physical movements that have rules and have planned movements aimed at maintaining the quality of human life (Giriwijoyo, 2005: 30 in the journal Governance by Gavrila J.V. Turang, et all. 2021: 1(2)). Nowadays, sport is not a very difficult activity, in fact nowadays sport is a movement that is very familiar everywhere. Many sports activities are carried out both in rural communities and in big cities. Many people are familiar with sports such as village level championships (Tarkam), regional level (Kejurda), provincial level (Kejurprov), national level (National Championship, Pon), even international level (Asian Games, Sea Games and Olympics).

Sport is a physical activity carried out by muscles and controlled by the human brain itself which has a specific goal. The government in Indonesia issued a law for sports in Law 11 of 2022, the law states "Sports are all activities that involve the mind, body, soul in an integrated and systematic way to encourage, foster and develop physical, spiritual, social, potential. and culture". Sport is a barometer for the progress of this nation. Therefore, the

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creation of human resources (HR) in the sports sector should start early, so that they are prepared as early as possible so that they can develop as expected and achieve optimal athlete performance by means of good athlete cultivation and development.

This sport can be done in groups (teams) or individually. According to (Yogama W, 2023) Sports are also carried out depending on the goals of the perpetrator, the goals of the perpetrator are divided into 3, namely:

1. Recreational Sports

Recreational sports are sports activities that are fun and contain elements of positive movement. This recreational sport is done only to fill free time or is easiest to have fun (Komang, Eka Triasa, 2020). One example of recreational sports is climbing, diving, etc.

2. Sports Achievement

Achievement sports are physical sports activities that are managed professionally to seek achievements (Puspodari and Muharram, 2010). This sporting achievement is marked by participating in championships, tournaments and matches.

3. Sports Education

Educational sports are sports that are carried out in an educational process on a regular and continuous basis. According to UUD no. 3 of 2005 paragraph 11 which states that "sports education is physical education and sport is carried out as a regular and continuous educational process to obtain some knowledge, personality, skills, health and physical fitness (AM Sudianto, 2019).

Taekwondo comes from three words, namely, Tae "means attacking using the feet", Kwon "means attacking or hitting using the hands", and Do "means discipline or art". Therefore, the meaning of taekwondo itself is an art or way of disciplining oneself with martial arts that only uses bare feet and hands (Sagittarius, 2009: 1). Studying the sport of taekwondo not only touches aspects of technical skills, but also touches physical aspects, mental aspects and spiritual aspects as well (Suryadi, 2003). Therefore, athletes who have studied taekwondo should have demonstrated good physical condition, strong mental and high spirits. Martial arts are not only used to defend oneself, but are also used to achieve achievements. Tactics in the sport of Taekwondo and fighting techniques or in Korean "Kyorugi" are aimed at reaching the chosen point on the opponent's body as quickly as possible in order to get points and reach the knockout round (Jacek Wasik: 2010). In the martial art of taekwondo, the most dominant technique used to attack is most of the legs which are called kicks or Chagi in Korean. This can be seen from the results of video observations of the final round of the BAKU WTC (World Tekwondo Championship) match in 2023 in June (https://www.youtube.com/watch?v=QmgQIJjlNIY) for the Senior Women 46 Kg class.

Taekwondo is one of the martial arts sports that is growing rapidly in Indonesia and is one of the most successful sports in Indonesia. This can be seen from the many branches of taekwondo that have been competed at various levels, regional, provincial, national and international championships, up to the biggest sporting event, namely the Olympics. The categories contested in Taekwondo are the Poomsae and Kyorugi categories. Through the many championships held, very competent taekwondo athletes are born and in the future they will compete in higher championships, such as at the national and international level. The development of achievements in the sport of Taekwondo has been good and has increased quite rapidly, but it needs to be developed and improved further. Until now, Kyorugi athletes in Indonesia have not been able to make maximum achievements in world or Asian events. However, several Indonesian Taekwondo athletes have tried their best. Improving sporting achievements will of course not be separated from the development of an appropriate coaching system in each sport, especially taekwondo. Along with the development and

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popularity of the sport of taekwondo which is already popular everywhere, it is very necessary to identify evidence-based athlete talent (TID) as well as training development programs based on the profile of future elite athletes. Identification and selection of elite athletes is a complex method and process that is influenced by several very varied factors so that it depends on the specific nature of the sports discipline (Mohd Rozilee Wazir Norjali Wazir, et al., : 2019).

The sport of Taekwondo is one of the sports that is experiencing rapid improvement as well as the latest or modern technology in the application of science and technology in the sport of taekwondo. In the martial art of taekwondo, one of the newest technologies is using the Protector Scoring System (PSS). By using the latest PSS technology, it really helps referees by reducing negative assumptions when determining athletes' points in a match. The latest match equipment uses PSS-based sensors, namely foot protectors or shocks, head protectors called head, and body protectors called body protectors. If the PSS sensor on the leg protector hits the body protector and head protector, points will appear on the scoring board screen. The development of the latest sensor technology (PSS) has begun to be carried out in matches in London and PON Indonesia in 2012 until now, various kinds of pros and cons still often occur along with current technological developments. The application of science and technology in sports with the latest technology can be seen in the 2023 Baku World Taekwondo Championship Final match in (June) under 46 Kg. The woman (chung) from Croatia named Lena Stojkovic fought (Hong) from Thailand named Kamonchanok Seeken (https://www.youtube.com/watch?v=QmgQIJjlNIY) which was downloaded on October 3, 2023. Video analysis of the Baku Final match The 2023 World Taekwondo Championship in June analyzes the Women's under 46 Kg class because this class is a light class and at the Olympics the Women's Heavy class is very rarely contested. Based on analysis of matches that have implemented the latest technological system, namely PSS, taekwondo athletes experience clear changes in technique and tactics when kicking, and these athletes are very dominant with just a few kicks used for attacking and defending.

We need to know whether the development of taekwondo athletes is using science and technology coaching using the best design or just because of the athlete's luck and experience. Therefore, there is a need for optimal, consistent and well-planned training for athletes by design so that it is hoped that there will be an appropriate training program for taekwondo athletes, measurable through measurements and tests that have been carried out in a tested, valid and reliable manner. And based on several existing literature studies and relevant sources, such as research by Aloui, (2022) which focused on testing the validity and test-retest reliability of speed tests on changes in the direction of taekwondo techniques when kicking, while research conducted by Ribeiro , et all, (2020), namely research that focuses on developing a system that can calculate the number and time of kicks in taekwondo techniques in general. Then another research by Sukma, F. F., & Komaini, A. (2019) focused on developing a sensor-based design for the Dollyo Chagi kicking skill test instrument for taekwondo athletes.
The objectives to be achieved in this research are as follows:
1. Develop and develop kick and punch test instruments for taekwondo athletes that are valid and reliable. Female Kyorugi Numbers > 17 Years of Age according to needs in competitions and training.
2. Developing norm values and converting standard values.

Related to this, the thesis research will focus on developing test instruments and technical skills in Taekwondo that are valid and reliable as material for evaluating coaching in the sport of Taekwondo, especially in the Province and Indonesia.

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Methods

The method in this research aims to provide a general overview of the types of research methods that will be used in this research. With this description the method can be placed in the context of existing methods (Niklas Litzenberger, 2023). A research method is a procedural method or systematic steps used to gain knowledge. Below are the research methods used in this research.

The type of research that will be used in this research is Planning, Production, and Evaluation (PPE) research. "The focus of Design and Development Research Can be On Front-end Analysis" (Richey and Klein, 2009). The focus of this design and development research is an analysis from start to finish, which includes Design, Production and Evaluation. Planning or planning is an activity that forms a plan for a product to be made and has a specific purpose, Production or producing is an activity that makes a product based on a design that has been made, and Evaluatio or evaluation is an activity of testing and assessing how high a product has been. tested whether it meets the specified specifications. The development research method has 4 different levels, namely:

(1) researching without testing (Level 1)
(2) not researching but testing (Level 2)
(3) Research and test to develop an existing product (Level 3)
(4) Researching and testing to create a product that does not yet exist (Level 4)

In this research, it is a development at Level (2) two, namely not researching but testing. The first stage in this level 2 (two) research is to determine a particular product, then complete it with existing literature studies, then carry out 3 stages of testing, namely stage I testing, stage II testing and stage III testing, if the testing has been carried out it will produce The test results are compared with the standard, and the final step is to convey conclusions and suggestions. To find out more clearly the flow of this research, the steps will be created as a research outline in accordance with the principles of development type research proposed by Richey and Klein (2009) as follows:

The subjects of this research were female senior Kyorugi Taekwondo athletes who were >17 years old with research subject criteria consisting of 20 people who had participated in regional, provincial, national and even international championships with the data collection location being in the Surabaya area.

Results

1. Planning is the activity of making product plans that will be made for certain purposes (Richey and Klein, 2009). The planning begins with a needs analysis which will be carried out through research and literature study.

2. Based on existing research by (Nopi H, 2023) together with FGD (Focus Group Discussion) experts, it is stated that:

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a. Dollyo Chagi's kick technique skills and Peta Chagi's kick technique skills have similar kick techniques, namely the goal and target of the kick is the same on the body and head. However, they still have different effectiveness due to the different starting times of the kicking techniques, so that it is concluded and results in a decision that these 2 (two) kicks are combined into 1 (one) technical skill test instrument for the Peta Chagi kick. Meanwhile, when compared to Yeop Chagi's Checking kick technique skills with Pyejoek's skills, Pyejoek's kicks are more effective and often produce points during the match. For technical skills in hitting, namely Jireugi/Jumoek, you can proceed to the next stage.

b. So, planning to develop taekwondo technical skills tests that are in accordance with the needs during the competition produces a product, namely developing 3 (three) types of kick technique skills tests, namely Peta Chagi and Pyejeok and 1 (one) punch, namely jireugi or jumoek starting at the starting position distance, the target when executing kicks and punches, and the assessment is limited to precise timing.

c. Based on existing research by (Nopi H, 2023) with the results of discussions with experts (Expert Judgment) it resulted in the height of the target point, determining the initial distance, determining the test time, and standard Operating Procedures (SOP), namely instructions for implementing test techniques and skill targets techniques for kicks and punches in the Taekwondo martial arts branch.

Table 1. Female Senior Taekwondo Skills Technique Validity Test Score

No.	Athlete Initials	Best Score Taekwondo Technique Skills			Total Score
		PetaChagi	Pyejeok	Jumoek/ Jireugi	
1.	RIA	20	16	29	65
2.	MAF	19	16	27	62
3.	CPR	21	17	29	67
4.	CAZ	21	16	28	65
5.	ZAS	20	17	29	66
6.	SSA	20	17	30	67
7.	MP	21	16	30	67
8.	AQA	19	17	30	66
9.	DM	20	17	31	68
10.	WD	21	15	31	67
11.	NPN	19	15	30	64
12.	AAS	21	16	31	68
13.	AKA	18	15	30	63
14.	KSA	19	17	28	64
15.	PAD	21	16	28	65
16.	FAW	21	15	26	62
17.	ZNC	21	16	29	66
18.	FCM	19	17	29	65
19.	SAKH	18	17	31	66
20.	ZHN	21	17	31	69

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Table 2. Interpretation of Product Validity Tests

Descriptive Statistics

	N	Mean	Std. Deviation
PetaChagi	20	20.0000	1.07606
Pyejeok	20	16.2500	.78640
Jumoek/ Jireugi	20	29.3500	1.42441
Valid N (listwise)	20		

Ukuran Font

Correlations

		PetaChagi	Pyejeok	Jumoek/ Jireugi	Total Skor
PetaChagi	Pearson Correlation	1	-.124	-.103	.431
	Sig. (2-tailed)		.601	.666	.058
	N	20	20	20	20
Pyejeok	Pearson Correlation	-.124	1	.200	.485*
	Sig. (2-tailed)	.601		.399	.030
	N	20	20	20	20
Jumoek/ Jireugi	Pearson Correlation	-.103	.200	1	.762**
	Sig. (2-tailed)	.666	.399		.000
	N	20	20	20	20
Total Skor	Pearson Correlation	.431	.485*	.762**	1
	Sig. (2-tailed)	.058	.030	.000	
	N	20	20	20	20

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3. Degree of validity

Koefisien Korelasi Dalam Uji Valdiitas	
Validitas	**Klasifikasi**
0,800 - 1,00	Sangat Tinggi
0,600 - 0,800	Tinggi
0,400 - 0,600	Cukup
0,200 - 0,400	Rendah
0,00 - 0,200	Sangat Rendah

Tabel 4. 3 Tabel Interpretasi uji Validitas Pearson Product Moment

Item Tes	**Rxy**	**r tabel**	**Keterangan**
PetaChagi	0,431	0,378	Validitas Cukup
Pyejeok	0,485	0,378	Validitas Cukup
Jumoek/Jireugi	0,762	0,378	Validitas Tinggi

Tabel 4. Degree of Reability

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Correlation Coefficient in Validity Test	
Validitas	**Classification**
0,800 - 1,00	Very high
0,600 - 0,800	Tall
0,400 - 0,600	Enough
0,200 - 0,400	Low
0,00 - 0,200	Very Low

Test Item	Rxy	r table	Description
PetaChagi	0,431	0,378	Sufficient Validity
Pyejeok	0,485	0,378	Sufficient Validity
Jumoek/Jireugi	0,762	0,378	High Validity

Tabel 5. Female Senior Taekwondo Skills Technique Reability Test Score

No.	Athlete Initials	Best Score Taekwondo Technique Skills			Total Score
		PetaChagi	Pyejeok	PetaChagi	
1.	RIA	20	16	29	65
2.	MAF	19	16	27	62
3.	CPR	21	17	29	67
4.	CAZ	21	16	28	65
5.	ZAS	20	17	29	66
6.	SSA	20	17	30	67
7.	MP	21	16	30	67
8.	AQA	19	17	30	66
9.	DM	20	17	31	68
10.	WD	21	15	31	67
11.	NPN	19	15	30	64
12.	AAS	21	16	31	68
13.	AKA	18	15	30	63
14.	KSA	19	17	28	64
15.	PAD	21	16	28	65
16.	FAW	21	15	26	62
17.	ZNC	21	16	29	66
18.	FCM	19	17	29	65
19.	SAKH	18	17	31	66
20.	ZHN	21	17	31	69

Tabel 6. skill reliability

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha[a]	Cronbach's Alpha Based on Standardized Items[a]	N of Items
-.032	-.028	3

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

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Inter-Item Correlation Matrix

	PetaChagi	Pyejeok	Jumoek/ Jireugi
PetaChagi	1.000	-.124	-.103
Pyejeok	-.124	1.000	.200
Jumoek/ Jireugi	-.103	.200	1.000

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PetaChagi	45.6000	3.095	-.139	.022	.289
Pyejeok	49.3500	2.871	.089	.051	.280[a]
Jumoek/ Jireugi	36.2500	1.566	.037	.046	.278[a]

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

Correlation Coefficient in Reliability Testing

Classification Validity	Classification Validity
0,800 - 1,00	Sangat Tinggi
0,600 - 0,800	Tinggi
0,400 - 0,600	Sedang
0,200 - 0,400	Rendah
0,00 - 0,200	Kecil

Cronbach's Alpha Reliability Test Interpretation Table

Test Item	Rxy	r table	Description
PetaChagi	0,289	0,378	Reliabilitas Rendah
Pyejeok	0,280	0,378	Reliabilitas Rendah
Jumoek/Jireugi	0,278	0,378	Reliabilitas Rendah

Tabel 7. Test item value conversion table

Score	Peta Chagi	Pyejeok	Jumoek/ Jireugi	Score
98		25		98
97			36	97
96	25			96
93		24		93
90			35	90
88		23		88
87	24			87
83			34	83
82		22		82
77	23	21		77
76			33	76
71		20		71
69	22		32	69
65		19		65
62			31	62
60		18		60
59	21			59
55			30	55
54		17		54
50	20			50
49		16		49
48			29	48
43		15		43
41	19			41
40			28	40
37		14		37
33			27	33
32		13		32
31	18			31
26		12	26	26
22	17			22
21		11		21
19			25	19
15		10		15
13	16			13
12			24	12
9		9		9
5			23	5
4	15	8		4

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Discussion

In theoretical studies, there are 5 basic technical skills in the martial art branch of taekwondo, namely punching, parrying, slashing, stabbing and kicking. Of the 5 types of technical skills, there are 8 types of punches, 16 types of parries, 8 types of slashes, 4 types of thrusts, and 14 types of kicks (Suryadi, V. Y., 2008). The basic taekwondo techniques that must be learned include kicks (Chagi), stances (Seogi), and punches (Jireugi) including Dobien Jireugi, namely double right and left punches. The following are the basic techniques of taekwondo according to (Prajuli. D., 2022):

1) Easel (Seogi)
2) Punch (Jireugi/Jumoek)
3) Puncture (Son/Hand)
4) Arm part (Palmok)
5) Elbow part (Palkup)
6) Kick (Chagi/Bal)
7) Parry (Makki)
8) Attack techniques (Attack Techniques)
9) Special Kick (Teuksu Chagi) which includes the Pyejoek kick.

There are implications from the results of this research related to the development of taekwondo technical skills test instruments for research subjects, namely taekwondo athletes, and the results of this research are expected to be a reference and guideline used to test and assess taekwondo technical skills, especially kicking techniques Peta Chagi, Pyejoek , and punches namely Jumok or Jireugi.

The limitations and follow-up in development research are:

a. On limited resources

Limited resources, namely limited budget, time and personnel for research.

b. On the limitations of generalization

The limitations of generalization only apply to certain populations or contexts, because this research only focuses on 17 year old female kyorugi athletes.

c. Limitations on environmental change

In environmental limitations in the development context, namely changes in the environment from external factors that cannot be controlled by researchers which can influence the results, such as when data collection coincides with preparations for athletes' competitions such as regional regional championships.

Based on the results of the research and discussion, it can be found that the research findings are instructions for implementing a valid and reliable taekwondo technical skills test, which can be used as a series of technical skills tests for a Taekwondo athlete, especially in the female senior Kyorugi category aged > 17 years.

Conclusions

From the series of results of test items for developing kick and punch technique skills and the discussions that have been carried out in this research, it can be concluded as follows:

a. The types of technical skills test instructions selected for a series of tests on taekwondo technical skills for kyorugi girls aged > 17 years are:

1) Instrument for testing technical skills in Peta Chagi kicks
2) Instrument for testing technical skills in Pyejoek kicks
3) Instrument for testing technical skills in punching (Jireugi or Jumoek)

b. A series of technical skills tests in the taekwondo martial arts branch consist of tests of Peta Chagi kicking technique skills and Pyejoek kicks as well as punching techniques (Jieugi or Jumoek).

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Suggestion

In accordance with the description of the research results, researchers can provide the following suggestions:

a. For Taekwondo martial arts branch administrators, trainers are expected to use this Taekwondo technical skills test instrument as a guide in evaluating, identifying and knowing the skill level of athletes in mastering kicking and punching techniques.

b. This test instrument on Taekwondo technical skills can be used as a reference in selecting athletes or used to identify potential future Taekwondo athletes.

c. For athletes, this test instrument for taekwondo technical skills can be used as a reference in the process of improving existing kicks and punches.

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