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The Development of Physical Potential Instrument of Taekwondo Ages 14-17

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Abstract

The purpose of this study was to develop a physical test model of taekwondo potential athlete age 14-17 years old. This type of research is R and D research (Research and Development). The research was conducted in several places, a sample of 300 athletes consisting of 150 male athletes and 150 athletes of the castle. Confirmatory factor analysis technique through SPSS program 23.00 with the provision if the measure of sampling adequacy (MSA> 0.5) then the instrument is feasible to use and (MSA <0.5) then the instrument is not feasible to use with significant level $\alpha = 0.05$, for confirmed the latent variables that determine the physical quality of taekwondo athletes. Validity uses content validity, reliability using Retrone's Alpha test retest and T_skor to equalize units. The result of this research are 10 physical test indicator ata taekwondo athlete category (kyorugie) age 14 - 17 year old son and daughter consist of reliability test obtained result (1) sit and reach test 0,719 and 0,609; (2) The reaction rate test (ruller drop test) of 0.674 and 0.540; (3) Coordination test (eye, hand and foot coordination) of 0.809 and 0.712; (4) The stroke balance test of 0.640 and 0.731; (5) Triple-jump test of 0.801 and 0.749; (6) Hex test (hexagon obstacle test) of 0.608 and 0.608; (7) The maximum velocity test (30m hurdles) of 0.817 and 0.740; (8) Hand Grip strength of 0.771 and 0.737; (9) Muscle endurance test (push up) of 0.871 and 0.737; and (10) Cardiorespiratory endurance test (multi-stage run) of 0.799 and 0.814.

Keywords: Physical, Potential Instrument, Taekwondo

1. Introduction

The training of taekwondo sport to high achievement not only rely on talent alone but technique, tactics, and physical condition also greatly influence. Champion is not born but created although talent is the dominant factor. According to Sugianto et al (2002: 16) states that the physical aspects of biological is very important in supporting the achievement, namely matters relating to the potential or ability of athletes in developing the physical components and organ function. The potential of athletes to develop physical components includes elements of velocity, reaction time, endurance, agility, coordination, power, fitness and balance. According to Irianto (2002: 65) physical is the foundation of sports achievement because techniques, tactics and mental will be developed properly if it has good physical quality. An athlete will develop his skills from basic techniques to advanced techniques when having enough physicality. The cornerstone of the athlete's election is the initial physical condition of the athlete's candidate, the physical plays a major role in the training process, with good physical engineering, tactics, and mentality can increase as the exercise process, if the physical does not support the athlete's performance, technicians, tactics and mental maximum therefore talent especially physical guidance needs to be implemented, because the beginning to start coaching is the availability of quality athlete seeds. Without qualified athlete seeds it will be difficult to get the optimal performance. There are several basic components of biomotor at taekwondo sport, including the components of kelentukan, coordination, speed balance, power, agility, reaction, and endurance. The components of biomotor power, stamina, coordination, flexibility and balance are a blend of several components of the sport's supporting biomotor which requires excellent physical condition. The test is the process of gathering information to obtain data, where the data can be used for evaluation. The test as data collection is a series of questions / exercises used to measure the skills of knowledge, intelligence, ability, or talent possessed by individuals, Riduan (2010: 30). The evaluation process is a decision-making based on the measurement results and the criteria standards obtained. Measurement and evaluation are two sustainable activities. Evaluation is done after the measurement and evaluation decision is done based on the

measurement result. Decision-making is done by comparing measurement results and defined criteria. Therefore, there are two activities in the evaluation that is making measurements and making decisions by comparing the measurement results with the criteria (Purwanto, 2014: 1-2). Prcess making tests should take into account: (1) the normality and measurement criteria that should be used, and (2) should have good test criteria. The test in question is a test that meets the requirements of validity, reliability, objectivity, discrimination, and praktibilitas. Validity is the most important criterion to consider when evaluating a test because validity refers to the degree to which the test actually measures the problem in measurement. This research uses construct validity. The validity of the construct refers to the degree of the individual who has anxiety, intelligence, and constructive motivation, which is assumed to be reflected in the test. The test is said to be good if it covers all existing criteria, that is valid, reliable, objective, discriminatory, and praktibilitas. Practice in the field is not necessarily the five criteria can be implemented as a whole but the test can be said good if it meets three main requirements. namely valid, reliable, and objective. This study uses the validity of content for estimating test instruments through professional judgment. The reliability used in this study is a retest (test-retest) because one test item is done twice. Measuring tool used in this research is the tools sit and reach, stopwatch, tape recorder, meter and handball, the tools are already in terakan so it is feasible for data retrieval. This study uses SPSS 20 as a tool in numerical calculation. The coaching of sports achievement has the stages of coaching, namely (1) stage pemassalan, (2) stage of nursery, (3) stage performance coaching. Many ways are done in looking for potential seeds for sports coaching achievements. The development of skills and the ability to exercise were divided into three groups, namely: (1) practical group started sport, (2) age group of specializing, and (3) group for the highest performance period (Bompa, 2009: 64). In the field of talent sports one needs to know whether a person is right developed or not in a particular sport. Talent test results can help clubs or schools to place good prospective athlete seeds according to the sports branch. A child who chooses and adjusts what sport suits his or her talents will make a child enthusiastic to achieve good performance. Conversely, a child who is forced or forced to pursue a particular sport will not be in accordance with what is expected, because work is not in accordance with his talent will cause low morale, self-distrust, make many mistakes and frustrating for individuals who concerned.

Taekwondo comes from Korea and is one of the popular martial arts. Taekwondo itself means the art of kicking and punching.

2. Methods

This research is a research with research and development method or often called R & D (Research and Development). The study was conducted in August-December 2017. The subjects of this study were taekwondo athletes aged 14-17 years in Central Java. Sampling technique used is purposive sampling, that is sampling technique by using certain criterion. Certain criteria in this study were athletes aged 14-17 years old so that the samples used in this study were athletes age 14-17 years spread across 4 regions in Central Java, consisting of 300 athletes for small group trials and 300 athletes for large group trials. Procedure / step of research and development consists of 10 steps of implementation, in this study simplified into 7 steps, namely: (1) Preliminary study, preliminary study conducted in two forms, namely literature study and field study of research empirical conditions. (2) Analyzing the information that has been collected, after conducting the preliminary study, the next step is to analyze the information obtained. In this research the information was obtained from the field observation in the form of discussion with the taekwondo trainer which discussed what physical components needed in taekwondo sport, (3) Development of prototype / initial product, after the development model based on the preliminary study was set, then did the discussion with the expert through Focus Group Discussion (FGD) to determine the physical components used in the taekwondo sport. Next, we prepare the physical test items 14 - 17 years of age.

3.Results& Discussion

Large group test results were used to determine test norms for athletes taekwondo age-age category (kyorugi) 14-17 years. This research was conducted in 4 regions in Central Java covering Surakarta, Semarang,

Purwokerto and Tegal. Furthermore, physical tests of taekwondo athletes age category (kyorugi) 14 - 17 years old in large groups with the number of athletes 150 sons and 150 daughters with age categories 14-17 years old men and women are grouped into norms of the test. The result of validity and reliability of taekwondo physical test instruments are: 1) Sit and reach test obtained value of 0,719 for son and 0,609 for daughter, 2) Ruller drop test obtained value equal to 0,674 for son and 0,540 for daughter, 3) eye, hand coordination and leg obtained values of 0.809 for son and 0.712 for daughter, 4) stork standing balancing test obtained value of 0.640 for son and 0.731 for daughter, 5) Triple hoop jump test obtained value of 0.801 for son and 0.749 for daughter 6) Hexagon obstacle test obtained value of 0.608 for son and 0.608 for daughter, 7) Running 30 meter obtained value equal to 0,817 for son and 0,740 for daughter, 8) Hand grip strength obtained value equal to 0,771 for son and 0,737 for daughter 9) Push up 1 minute the value of 0.871 for the son and 0.737 for the daughter and 10) The multistage run obtained values of 0.799 for the son and 0.814 for the daughter. To find out the results of data obtained on each test component then created table classification per item test. Here are the results of large scale table scores for prospective athletes taekwondo sons and daughters presented in the table below.

The results of sit and reach test values can be seen in table 1.

Table 1. *Sit and Reach* Test

Score	***Sit and Reach* Male**	***Sit and Reach* Female**
5	≥ 41,99	≥ 38,27
4	34,49 – 41,98	32,24 – 38,26
3	26,98 – 34,48	26,21 – 32,23
2	18,86 – 26,97	17,67 – 26,20
1	≤ 18,85	≤ 17,66

The results of the ruller drop test can be seen in table 2 below:

Table 2. Score *ruller drop test*

Score	***Ruller Drop Test* Male**	***Ruller Drop Test* Female**
5	≤ 2,24	≤ 2,68
4	2,25 – 7,52	2,26 – 7,70
3	7,53 – 12,38	7,71 – 12,34
2	12,39 – 17,25	12,35 – 16,98
1	≥ 12,39	≥ 12,34

The results of hand and foot eye coordination values can be seen in table 3 below:

Table 3. Eye and Hands Coordination Test

Score	**Eye and Hands Coordination Male**	**Eye and Hands Coordination Female**
5	≥ 45	≥ 31
4	32 – 44	23 – 30
3	20 – 31	16 – 22
2	7 – 20	6 – 15
1	≤ 7	≤ 6

The result score of standing stork balance can be seen in table 4 below:

Table 4. *standing stork balance* Test

Score	***Standing Stork Balance* Male**	***Standing Stork Balance* Female**
5	≥ 23,74	≥ 23,64
4	17,37 – 23,73	17,49 – 23,63
3	11 – 17,36	11,34 – 17,48
2	4,10 – 10,99	4,67 – 11,33
1	≤ 4,09	≤ 4,66

The result of standing stork balance can be seen in table 4 below:

Table 5. *triple hoop jump test*

Score	***Triple Hoop Jump Test* Male**	***Triple Hoop Jump Test* Female**
5	≥ 13,26	≥ 9,83
4	10,30 – 13,12	8,03 – 9,82
3	7,35 – 10,29	6,23 – 8,02
2	4,27 – 7,34	4,15 – 6,22
1	≤ 4,24	≤ 4,14

The result of the hexagon obstacle test can be seen in table 6 below:

Table 6. *hexagon obstacle test*

Score	***Hexagon Obstacle Test* Male**	***Hexagon Obstacle Test* Female**
5	≥ 7,23	≥ 7,08
4	5,85 – 7,22	5,86 – 7,07
3	4,62 – 5,84	4,64 – 5,85
2	3,32 – 4,63	2,32 – 4,63
1	≤ 3,31	≤ 2,31

The result of 30-meter sprint value can be seen in table 7 below:

Table 7. 30 meter sprint test

Score	30 meter sprint test Male	30 meter sprint test Female
5	≤ 4,67	≤ 5,59
4	5,40 – 4,68	5,58 – 6,17
3	6,13 – 5,41	6,18 – 6,77
2	6,93 – 6,14	6,78 – 7,42
1	≥ 6,13	≥ 7,43

The results of hand grip strength can be seen in table 8 below:

Table 8. *hand grip strength test*

Score	*Hand Grip Strength* Male	*Hand Grip Strength* Female
5	≥ 76,18	≥ 49,70
4	56,67 – 76,17	39,11 – 49,69
3	37,15 – 56,66	28,51 – 39,10
2	16,02 – 37,14	17,03 – 28,50
1	≤ 16,01	≤ 17,02

The result of push up Score can be seen in table 9 below:

Table 9. *push up* test

Score	*Push Up* Male	*Push Up* Female
5	≥ 30	≥ 26
4	22 – 29	19 – 25
3	16 -21	13 – 18
2	9 – 15	7 – 12
1	≤ 9	≤ 7

The results of multi-stage running can be seen in table 10 below:

Table 10. multi stage fitness test

Score	Multi stage fitness test Male	*Multi stage fitness test* Female
5	≥ 39,06	≥ 30,49
4	31,83 – 39,05	25,98 – 30,48
3	24,59 – 31,82	21,46 – 25,97
2	16,75 – 24,58	16,57 – 21,45
1	≤ 16,74	≤ 16,56

Furthermore, the norm of testing for prospective athlete taekwondo age 14-17 years to find out test results that have been tested. Unit tests are equated with T_score. The results of the overall norms of male physical tests can be seen in table 11 below

Table 11. Men's Physical Test Norm

Score	Amount Of Score	Classification
5	≥ 38	Very Good
4	35 – 37	Good
3	32 – 34	Enough
2	29 – 31	Less
1	≤ 28	Less Once

The results of the overall norm of the female physical test can be seen in the following table 12

Table 12. Women's Physical Test Norm

Score	Amount Of Score	Classification
5	≥ 37	Very Good
4	33 – 36	Good
3	30 – 32	Enough
2	27 – 29	Less
1	≤ 26	Less Once

Development activities can be undertaken if there is a need for data analysis based on field conditions. Development of physical tests for taekwondo athletes aged 14-17 using a procedural descriptive model in which tests for athletes age 14-17 outline the research and development steps that must be followed to produce the product. The basic steps that must be taken to create a test model is the conceptualization of problems, product creation, and product testing. Furthermore, if the decision is accepted then product creation can begin and if it has not been accepted then the process must be repeated. This step is used to build and develop tests in the hope of obtaining valid and reliable instruments involving sports experts, especially badminton sports specialists, sports evaluations, test and measurement experts, and experts in research methodologies.

From the data analysis using confirmatory factor analysis, there were 10 indicators of physical condition of Taekwondo athlete category of match (kyorugie) both son and daughter. The dominant factors of the physical condition of Taekwondo athlete in the category of match (kyorugie) in both sons and daughters are 10 indicators consisting of set and reach test, ruller drop test, hand and foot eye coordination, standing stork balance, triple hop jump, hexagon obstacle test, meter, hand grip

strength, push up and run multi-stage. Having known the dominant factor of physical condition of Taekwondo athlete category of macthes (kyorugie) sons and daughters continued with correlation analysis of produck moment, which aims to strengthen the research findings. Basically, these components need to be followed up with a continuous training process and should pay attention to technological developments. In order to find the results of this study useful for athletes and sons and daughters to achieve better performance. The development of sports science that is the theoretical basis for the development of sports will certainly provide a valuable contribution to the achievement of the sport itself, especially Taekwondo macthes category (kyorugie). As a sport that develops into the realm of sporting achievements of course Taekwondo requires various studies of sports science as a foundation of achievement development.

4.Conclusions

Based on the results of the research described in the discussion chapter, it can be concluded that: (a) A valid and reliable physical test model to train a taekwondo athlete candidate consists of 10 physical tests. The contents of the test model are: (1) sitting and reaching, (2) ruller fall test, (3) eye coordination, hands and feet, (4) standing stork balance (5) triple hop leap, (6) , (7) runs 30 meters, (8) hand grip strength, (9) push ups, and (10) multi-stage run.

Some of the advantages possessed by the Taekwondo test instrument model development product are: 1) Aspect Originality, is the work of researchers with a distinguishing feature compared with similar physical Taekwondo physical exercise test instruments that already exist. 2) Aspects of Excellence Innovation, has excellence in terms of quality of innovative work, from the results of innovation and innovation of researchers. 3) Aspects of Extra Privileges, have an advantage in terms of physical test specifications, so the tests can be used specific by Taekwondo athletes. 4) Economic aspect, the price is very economical and affordable and has a high efficiency for the wider audience in support of national sports coaching efforts. 5) Security and comfort aspect, has a good level of security and comfort for Taekwondo athletes aged 14 to 17 years old.

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