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Arrangement of Physical Test Instrument for Tarung Derajat in Adult Category

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Abstract

This study aims to (1) determine the most dominant bio-motor components in the adult Tarung Derajat Martial Arts, (1) To produce the composition of a physical test kits adult derajat fighting category. (2) To produce a manual for the the instruction book for adult tarung derajat martial art physical test instrument. (3) Investigate the trainer's response to the instruction book for adult tarung derajat martial art physical test instrument. This type of research is (R&D) research using a 4D development model. This development model consists of four stages: define, design, develop, disseminate. This research was conducted at PB Kodrat Yogyakarta which involved two validators, a material expert, a physical condition expert, three practitioners, two colleagues, and ten Tarung Derajat Martial Arts trainers. The data collection technique was a questionnaire, the Delphi method, and an assessment rubric. The validity test used content validity which was analyzed using the Aikens v formula and concurrent validity was analyzed by using product-moment correlation. The Reliability test used Alpha Cronbach. This research produced a manual instruction book for the physical test of adult Tarung Derajat Martial Art which consists of 12 items : (1) side split, (2) sprint 20 meter, (3) hexagonal obstacle, (4) standing broad jump, (5) shoken test (6) expanding dynamometer (7) leg dynamometer (8) back leg dynamometer (9) 1 minute push ups , (10) 1 minute sit ups, (11) wall squat test, (12) sprint 2,4 km. the physical test instrument for fighting martial arts degrees is declared valid with r count > from r table with details, product content validity is 0.94 > 0.632, and the test is declared reliable with Cronbach's alpha value 0.945 > 0.765. The product of the physical test instrument for adult Tarung Derajat Martial Arts has a feasibility percentage of 100% with a very strong/decent/appropriate category from a material expert and 100% very strong/decent/appropriate from a physiotherapist. The trainer's response to the instruction book for adult Tarung Derajat Martial Art was a percentage of 96% which was categorized as very strong/decent/appropriate.

Keywords
physical test instrument; tarung derajat martial arts; an adult tarung derajat martial arts

I. Introduction

Law Number 3 of the Republic of Indonesia of 2005 and Government Regulation of the Republic of Indonesia of 2007 concerning the National Sports System, Article 4 concerning the basics, functions and objectives of sports, namely: National sports aim to maintain and improve health, fitness, achievement, and quality. instilling moral values and noble character, sportsmanship, and discipline, strengthening, advancing the unity and integrity of the nation, strengthening national resilience, and increasing the dignity of the

nation. One of the fields that often raises the dignity of the nation is the field of achievement sports.

Optimal hacking will be achieved If you practice in a high-quality way and use the concept of pyramid building as a process to achieve goals. Using the use of science and technology to obtain information about the physiological characteristics of athletes can be used as a guide in planning an exercise program. more broadly, performance improvement is not just one-sided. Although many aspects contributed to this achievement. The role of physiology is one of the disciplines that makes scientific contributions to sport in supporting increased achievement (Utami, D., 2015).

One of the sports that have been competed in achievement sports in Indonesia is martial arts degree. Tarung derajat is one of the sports that has been competed as an achievement martial sport at the district/city, provincial, national and Asian levels. Tarung derajat is an original Indonesian martial art created by Guru Haji Acamad Drajat in the 1960s in Bandung - West Java.

Tarung derajat is a martial art that relies on the logic of moral action that comes from feelings, thoughts, and emotions belief in utilizing the three main factors of the life force compound, namely muscles, brain, and conscience in a realistic and rational manner to develop the five elements of locomotion, namely strength, speed, accuracy, courage and tenacity which are applied in an aggressive and dynamic self-defense system. in the form of punches, kicks, parries, slams, locks, evasions, capokans and other important body movements that are in accordance with techniques, tactics, and defensive - attacking - attacking - deadly techniques that are practical and effective for a martial arts sport (Drajat 2017 : 8).

Tarung derajat is a martial art that applies a full body contact system in every fight/match of its achievements, so that in its training method, fighting degrees emphasizes 3 aspects, namely: physical, moral and mental. Physical training is the initial stage in every process of developing combat athletes, both beginners and seniors, so that it is hoped that through physical training, combat athletes will have good physical fitness.

To maintain the physical stability of a fighting athlete, a fighting athlete needs to be fostered continuously. This needs to be done because to maintain the stability of the physical condition of a fighting degree has a direct impact on winning when participating in a match. Therefore, the physical aspect of fighting martial arts is very necessary in preparing athletes to take part in the competition. aspects of physical condition that need to be considered are: abdominal muscle endurance, agility, togok flexibility, abdominal muscle strength, arm muscle endurance, speed and VO2 Max (Noviatmoko, 2016).

Physical condition is a very important factor in determining sports achievement, because in training Tarung derajat athletes of physical condition must be the main consideration factor Hendarto, S., & Rahayu, T. (2018). The physical condition is a unified whole and cannot be separated from the biomotor components, both in repair and maintenance. That is, to improve physical conditions, all biomotor components must be developed. According to Setiawan, D. (2013).

Physical condition is an absolute requirement in improving athlete achievement, it can even be said as a basic need that cannot be postponed or negotiable, (Teja et al., 2015). The better a person's physical condition or ability, the higher the chance of achievement (Aldani, 2020). Physical exercise is one way to improve overall physical fitness (Demorest et al., 2016).

Physical activity is an inseparable part of the life of living things, ranging from simple to very complex activities. As a living creature, humans need physical activity as

an effort to maintain the existence of their lives. Every individual in his life must be doing physical activities both intentionally and unintentionally, because physical activities are carried out with diverse and diverse purposes. (Sulaiman, et al. 2020)

Good fitness or physical condition is the initial foundation for athletes in launching techniques, tactics and strategies in a match (Setyo Budyanto 2012:29). Physical condition is an important factor and is the foundation / foundation in terms of technical development, tactics, strategy, and mental development Bafirman & Wahyuri (2019:5). Thus, good physical condition is a condition that must be owned by an athlete.

Good physical condition is a prerequisite that must be possessed by an athlete in improving and developing optimal sports performance so that all of his physical conditions must be developed and improved according to the characteristics, characteristics, and needs of each sport, Supriyoko, A., & Mahardika, W. (2018).

This suggests that a cut-off point for age is needed to help trainers identify a person's high level of physical fitness that can be used as material for an exercise development plan. Roberts, et al. (2016: 80). So that it is hoped that after the preparation of physical test instruments that are in accordance with the characteristics and age of combat martial arts degrees, it is hoped that training can also consider several aspects, including the age of the athlete, personal potential, level of preparation or training stages, the focus of training for each sport depending on the characteristics of the sport (Setyo Budyanto, 2012:35).

The success or failure of the athlete's performance depends on the coach, it is hoped that the coach can develop a test instrument and measurement of physical condition as a reference material for training make an exercise plan, so that it can improve athlete achievement. Hariadi, I., Fadhli, NR, & Taufik, T. (2019).

A test is a tool or another name for an instrument, which is a tool used to obtain or collect information needed by Fenanlampir and Faruq (2015: 3). This means that the physical test is a tool to obtain information and data as material for evaluating a person's physical condition.

Evaluation is the process of interpreting the collected measurements and determining some values. The interpretation of this value is often done by comparing the results with predetermined criteria or objectives. Without the availability of tests and measurements as well as norms used for comparison, the evaluation process will get poor results. Lacy, AC, & Williams, SM (2018). So that evaluation cannot be separated from the training program. Evaluation is an activity that determines the extent of the athlete's ability and mastery of the training objectives intended by Setyo Budyanto (2012: 124).

Evaluation is an inseparable part of various human activities, as well as in sports teaching and training activities. Because by carrying out these three things we can find out developments and shortcomings, so that we can finally make the right decision (Asnaldi; 2019).

Evaluation is done by comparing the data in the field with the standard so that a picture that shows the actual situation compared to the standard is obtained. This evaluation model also allows researchers to be able to give consideration without having to make decisions. (Aini, S. et al. 2019)

From the results of the researcher's observations during the championship at the Bandung West Java 2019 National Sports Week (Prapon) the researchers observed that some DIY-level fighting athletes lost due to a decrease in physical condition. Based on the case examples described above, it is illustrated that the physical component of the martial arts degree is an important part that needs to be considered. So the researchers decided to find out what were the obstacles for each coach in the physical development process.

Based on the results of a preliminary study conducted by researchers in the fighting sport family, the special region of Yogyakarta (DIY) shows that: in the last few years, starting from 2016 - 2019 there has been a decline in achievement, meaning that in 2016 the DIY fighting athletes got one gold medal, one bronze medal and one passed one athlete so that the number who passed the 2016 PON was three athletes. Meanwhile, Prapon in 2019 experienced a decline, where Tarung derajat DIY only got one bronze medal and only one athlete passed. Thus, there are fewer fighting athletes who qualify for the Papua PON in 2021 than the athletes who pass the 2016 West Java PON.

From the results of the research conducted by the researcher with several trainers in the Regency/City and the main trainer of Tarung derajat DIY (KD) through interviews, the data obtained shows that; the coaches have given physical exercise to athletes but to measure and determine the physical condition of the athlete the coach is still experiencing problems regarding the test equipment used. This is because there is no arrangement and guideline for the physical test instrument for fighting martial arts, the category of fighting adults specifically for this martial art. So far, the physical tests carried out are still using the general test conducted by KONI DIY, so it is not clear how far the physical condition of the speech fighting athletes (KD) of DIY coaches is.

Apart from the fact that the physical test instrument for combat martial arts has not yet been prepared, the norms for the physical test have not yet been made. Therefore, in addition to the preparation of physical test instruments, it is also necessary to make a physical test guideline for the martial sportcategory which contains test norms, in order to classify the results of the tests carried out. Because the physical test instrument for fighting martial arts degrees today is very much needed by coaches in knowing the physical condition of athletes and as a source of data to evaluate and develop training programs.

Furthermore, KD, the main trainer of the Yogyakarta fighting degree said that: the most important thing that a combat athlete must prepare is his physicality because technique and mentality will follow when the athlete has a good physique. because without a good physique, athletes will find it difficult to face matches.

So that the basic factors in achieving achievement include physical, technical, tactical and mental preparation, physical abilities are prepared to obtain better technical skills, better technical skills are prepared to obtain good tactical abilities, so that the next focus is mental formation (Setyo Budianto, 2012:35). So that the trainer must know what components are the most dominant in martial arts degrees in order to be able to develop a good training program

From the results of the analysis, there are several physical biomotor components needed by DIY fighting athletes such as: (flexibility, speed, agility, power, coordination, strength and endurance). Therefore, a physical test instrument for fighting martial arts degrees is needed to evaluate the physical condition of the DIY degree fighting athletes, because without a physical test instrument that is in accordance with the characteristics of the coach's fighting martial arts branch, it will be difficult to know the extent of the physical condition of the athletes being fostered.

Furthermore, the main trainer of DIY gave suggestions that the physical test instrument that you want to make should be adjusted to the age and characteristics of the degree of fighting martial arts, because in the degree of fighting itself there are categories and age limits that are required to take part in the degree of achievement fighting championships. In terms of athlete growth and development there are also differences between early ages, adolescents and adults, so this also needs to be considered. Based on the statement above, it can be concluded that it is necessary to develop a physical test

instrument according to the age category and the characteristics of the degree fighting sport which is focused on the components of biomotor needs in combat martial arts.

From the results of the preliminary study, the researcher wants to develop a test instrument that is appropriate to the age and characteristics of the needs of the sport of martial arts. The physical test instrument that the researcher wants to develop is a physical test instrument for fighting martial arts degrees in the martial sportcategory. It is hoped that the existence of a physical test instrument for fighting martial arts in the martial sportcategory can help coaches in knowing the physical condition of the athletes being fostered and as a materials for evaluating and compiling an exercise program.

II. Research Methods

This research is classified as Research and Development (R&D) and uses a 4D development model. This development model consists of four stages. According to Sugiyono (2015: 37.38), the four stages are defining, designing, developing and disseminating. From the several existing steps, it was then adjusted to the actual research needs from 4 designs to 3 designs of development research procedures where this research only reached the development stage.

The initial stage is an analysis of the needs of the dominant biomotor component in combat martial arts athletes in the martial sportcategory which is discussed with experts and practitioners through the Delphi Method. After obtaining the physical test instrument item for the martial sportcategory, the initial product was then validated by material experts and physical condition experts. Furthermore, the product was carried out in a limited trial to see the readability of the product of the physical test instrument for the martial sportmartial arts category. The subjects in this study were combat trainers from the special region of Yogyakarta.

Technique Data collection in this study uses a survey to analyze needs, the Delphi method, and an assessment rubric. The tool used in the survey uses an indirect questionnaire. The first is the percentage calculation, which is used to calculate the results of the field research questionnaire. The second is to use the aiken v formula to test content validity. The three product validity tests use concurrent validity testing and are processed using product moment correlation. The fourth reliability test uses a test using Cronbach's alpha. Fifth, for the preparation of norms using a standard value of a scale of 5 involving the mean and standard deviation.

III. Discussion

From the results of the analysis and discussion with the DIY degree fighting trainer, it was found that there are 7 dominant biomotor components in the terajat martial arts, namely (1) flexibility, (2) speed, (3) agility (agility), (4) explosive power (power (5) coordination), (6) strength (strength), (7) endurance (cardiovascular endurance/ VO2.Max and muscle endurance). The following is the explanation:

3.1. Flexibility

Flexibility of the legs is the most important thing that every fighting athlete must have because in kicking the athlete is required to attack from the belt up used by other athletes or the leg attack must pass through the waist to the head of the opponent. In addition, the flexibility of the waist is also needed by fighting athletes to avoid the opponent's attack by doing body moving.

According to Tirtawirya, D. (2005) Flexibility is a condition in which muscles and joints can move freely. This flexibility is important because the biggest points are earned if an athlete can kick his opponent's head. High kicks can only be done if a fighter has good flexibility. Flexibility exercises in combat sports include splits, kiss knees and many more.

3.2. Speed

Speed is a must-have for every fighting athlete, because fighting athletes need high speed to carry out fast attacks, both punches and kicks to earn points. In addition to punching and kicking, fighting athletes must also be fast in moving, (moving the body, dodging the opponent's attack and moving quickly in attack). Speed is the ability to move from one place to another in the shortest possible time. Ridwan, M. (2020).

According to Tirtawirya, D. (2005) Speed is the ability to complete kicks and punches in the shortest time possible. Speed is a very important part in combat combat degrees. The degree fighting competition is influenced by speed, because if you lose quickly, it is difficult to get points. There are many types of combat speed training among them; run fast, do drill sport degrees etc. Kicks and punches in combat degrees can be used to model speed training.

3.3. Agility

Agility is the most important thing that every fighting athlete must have because fighting athletes must always be agile in moving. Move to avoid, parry and agile in carrying out attacks (punches and kicks). This will greatly assist athletes in issuing more maximal and varied techniques so that the athlete's movements are difficult to read by opponents. Agility is a person's ability to make movements in all directions easily Suntoda, A. (2009).

According to Ridwan, M. (2020) Agility is a person's ability to change direction quickly and precisely without losing balance when moving. Agility is closely related to speed and flexibility. Without these two elements, one cannot move swiftly. In addition, the balance factor also has a great influence on a person's agility.

3.4. Explosive Power

Power or power Explosion is something that fighting athletes really need in combat because fighting degrees are full body contact martial arts that do not only rely on points to win but also aim for absolute defeat by knocking out the opponent. Attacking the opponent with great power is something that every athlete wants because when the athlete has great power, it will make the athlete feel confident in his abilities. The power needed by fighting athletes is leg power and hand/arm power. Explosive power is a person's ability to use the maximum force that is deployed in the shortest time to do repulsion. Reject in this case it is stated as power or explosive power Ridwan, M. (2020).

Meanwhile, according to Tirtawirya, D. (2005) Explosive power or power is the product of strength and speed, so that if the leg has good power, of course if you take a kick the result will be relatively strong and fast. Power training in combat sports uses plyometrics, for example, jumping, jumping, and going up and down stairs, drill kicks with jumps and many others.

3.5. Coordination

Coordination is something that a fighting athlete must have, because in a fighting competition there are rules that are required for fighters to carry out attacks. Fighting athletes are required to be aggressive and carry out a combination of attacks between

punches and kicks to a predetermined area, so that coordination is needed for high-level combat athletes to avoid mistakes that can result in warnings and point deductions.

According to Tirtawirya, D. (2005), coordination is the body's ability to perform various movement activities in almost the same time. Fighting competition requires good coordination, because fighting athletes must be able to see the opponent, parry, dodge and counterattack at almost the same time.

3.6. Strength

Strength is an important thing in fighting degrees because strength is a support in the performance of fighting athletes whose maximum strength will be confessed to power. In fighting, the muscles needed by combat athletes are hand/arm strength, leg/leg strength and back strength.

Strength is a physical component that needs to be considered and developed to improve performance in the sport of combat martial arts degrees Hambali, H., Syamsulrizal, S., & Ifwandi, I. (2015).

According to Tirtawirya, D. (2005) muscle strength is a condition in which the body can cope with a certain amount of load. When fighting, the athlete's body must be strong enough, because if the muscles are not strong enough it can cause fracture, sprain or other injury. Therefore, in combat training, physical training is always given in the form of strength. For example, in fighting degrees have various forms of strength training such as; push-ups, sit-ups, sit-ups, leg lifts, leg curls, etc. This form of strength training does not always have to use tools, but can also use your own body weight or in pairs with friends.

3.7. Endurance

Endurance is one of the physical components that need to be considered and developed to improve performance in the combat martial arts branch of the degree Hambali, H., Syamsulrizal, S., & Ifwandi, I. (2015).

According to Bafirman, B., & Wahyuri, AS (2019). Endurance is defined as the length of time a person can endure a certain work intensity which is far from tired. Muscular endurance is the ability of muscles to contract repeatedly without experiencing fatigue, whereas cardiorespiratory endurance is the ability of the whole body to exercise for a long time without fatigue. Endurance is divided into two parts, namely: local muscle endurance and cardiovascular endurance. Local muscle endurance or often referred to as mascular endurance, while general endurance is called endurance (cardiorespiratory endurance) or aerobic endurance.

a. Muscle Endurance

Muscular endurance is really needed by combat athletes because to keep the body from getting tired easily, some parts of the muscles must be trained. From the results of the analysis, researchers get 3 components of muscle endurance that play an important role in supporting the performance of combat athletes, namely abdominal muscle endurance, arm/shoulder muscle endurance and leg muscle endurance. Local (muscle) endurance: The ability of muscles to sustain static or dynamic activities for a long time Suntoda, A. (2009).

b. Cardiovascular Endurance (VO2.Max)

Cardiovascular endurance is very much needed by fighting athletes because in the competition the time used is 3 minutes x 3 rounds. Combat athletes are required to always be aggressive and not always back down in the fight. If the fighting athlete always backs down, the athlete will get a warning until points are deducted. So this VO2.Max is really needed by fighting athletes so that they can quickly return to choosing from fatigue or not

experiencing significant fatigue during the match. General Endurance (Cardio-respiratory): A person's ability to perform physical activities in a relatively long time with sub-maximal loads and constant exercise intensity Suntoda, A. (2009).

According to Tirtawirya, D. (2005) Endurance is a person's ability to perform aerobic and anaerobic activities for a long time. The time used in fighting degrees in the match is 3 rounds with a time of 2-3 minutes. The length of time competing requires athletes to have good endurance. Endurance training in fighting degrees can use: interval training, fartlek, target circuit, target sparring, darajat sports and others.

3.8. Delphi Method Results

As for the results of expert input through the Delphi method, the results of the composition of the physical test instrument for combat martial arts degrees in the martial sportcategory are as follows:

Table 1. Results of the Preparation of Physical Test Instruments Adult Combat Category Rank Martial Arts Physical Test Item

No	Component		Test
	Biomotor	Type	
1	Flexibility	limbs	*side split*
2	Speed	Run	*20 meter sprint*
3	Agility		*Hexagonal Obstacle Ageliti Test*
4	Power	limbs	*Triple hup jump*
5	Power dan coordination		*Shoken test*
6	Strength	Hand/ Arm	Expand *Dynamometer*
		limbs	*Leg dynamometer*
		Back	*Back lag dynamometer*
6	muscle endurance	Arm muscle	*Push ups* 1 minute
		Abdominal muscles	*Sit ups* 1 minute
		Limb Muscles	*Wall squats Test*
7	Durability aerobics	Aerobics	*Run 2.4 km*

3.9. Expert Validation Results (Material)

Based on the results of the assessment related to the content of the product material in the table above, it can be concluded that from the aspect of the material it has conformity. The details of the assessment are as much as 67% of the content of the material is very appropriate and as much as 33% of the content of the material is appropriate. It can be concluded that the content of the product material is 100% very appropriate. For more details, see the following diagram:

Figure 1. *Meter Expert Validation Result Chart*

3.10. Expert Validation Results (Physical Condition)

Results The assessment related to the contents of the manual for the physical test instrument for the combat martial arts category in the martial sportcategory, in the table, it can be concluded that from the aspect of physical condition it has conformity, with a percentage of 100% in the very appropriate category. For more details, see the following diagram:

Figure 2*. Physical Condition Expert Validation Diagram*

3.11. Limited Trial Results

Based on the results of the limited trial of the book product which contains the composition and guidelines for the implementation of the physical test of fighting grades in the martial sportcategory, it shows that the total value of a scale of 5 (very suitable) is 63 with a percentage of 57%, while the total value of a scale of 4 (appropriate) is 43 with a percentage of 39%, and the overall score of 3 (quite appropriate) is 4 with a percentage of 4%. This shows that the trainer's response to the product manual for the physical test instrument for combat martial arts in the martial sportcategory has a suitability of 96%, meaning that the product is included in the category of very strong / appropriate / feasible. Furthermore, it can be concluded that the manual product which contains the structure of the physical test of the combat martial arts category for the martial sportcategory has conformity in terms of the first few aspects. according to the needs of fighting athletes the degree has an appropriate score of 7 and is appropriate 3. Third The number of physical test items can be carried out has a very appropriate value of 7 and appropriate 3. The four test instruments are easy to understand have an appropriate score of 7 and appropriate 3. The five test instruments are easy to apply has a positive score of 5 and 4 is neutral 1. The six test instruments according to the needs of combat athletes in the martial sportcategory have an appropriate score of 6 and 3 are neutral 1.The seven physical needs are in accordance with the stage of growth and development of adults 18-35 years have a very appropriate value of 6 and appropriate 4. The eight physical tests used are in accordance with physical targets have a very appropriate value of 6 and appropriate 4. The nine tools used are in accordance with the target the physical test has a very appropriate value of 6 and is appropriate 4. The ten tools used are in accordance with the target of the physical test having a very appropriate value of 6 and appropriate 4. The eleventh has a very appropriate value of 6 and appropriate 3 neutral 1. More details can be seen in the following diagram this ;The nine tools used are in accordance with the physical test target and have a very appropriate score of 6 and appropriate 4. The ten tools used are in accordance with the physical test target have a very appropriate value of 6 and appropriate

4. The eleventh has a very appropriate value of 6 and appropriate 3 neutral 1. More details can be seen in the following diagram;The nine tools used are in accordance with the physical test target and have a very appropriate score of 6 and appropriate 4. The ten tools used are in accordance with the physical test target have a very appropriate value of 6 and appropriate 4. The eleventh has a very appropriate value of 6 and appropriate 3 neutral 1. More details can be seen in the following diagram;

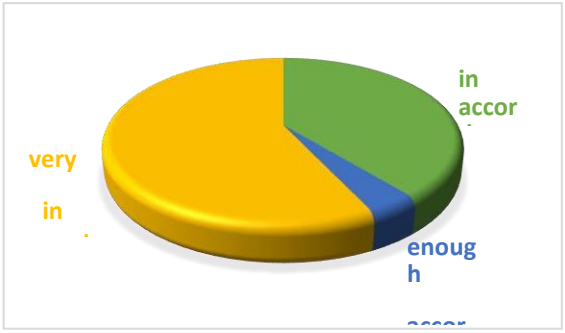

Figure 3. *Diagram of the Results of the Trainer's Assessment of the Product*

3.12. Physical Test Norms

Table 2. Hexagonal Agility Norms (Fenanlampir & Faruq, 2015)

Category	**AGE > 18 Years**			**Weight 8%**
	Man	**Woman**	**Score**	**Score**
Very good	> 12.10 seconds	12.42 seconds	50	4
Well	12.11 -13.52 seconds	12.43 -14.09 seconds	40	3.2
Enough	13.53 -14.96 seconds	14.10-15.74 seconds	30	2.4
Not enough	14.97-16.39 seconds	15.74-17.39 seconds	20	1.6
Not enough very	< 16.40 seconds	> 17.40 seconds	10	0.8

Table 3. Norma Triple Hupp Jump Left Leg (Puslatda PON DIY Test 2020)

Category	**AGE > 18 Years**			**Weight 4%**
	Man	**Woman**	**Score**	**Score**
	Left STJ	**Left STJ**		
Very good	> 9.34 m	> 8.05 m	50	2
Well	9.34 - 8.18 m	8.05 – 7.16 m	40	1.6
Enough	8.18 – 7.60 m	7.16 – 6.71 m	30	1.2
Not enough	7.60 – 5.87 m	6.71 – 5.37 m	20	0.8
Not enough very	< 5.67 m	< 5.37 m	10	0.4

Table 4. Norma Triple Hupp Jump Right Leg (2020 PON DIY Puslatda Test)

Category	AGE > 18 Years			Weight 4%
	Man	Woman	Score	Score
	Right STJ	Right STJ		
very much good	> 9.40 m	> 8.09 m	50	2
Well	8.23 – 9.40 m	8.09 - 7.18 m	40	1.6
Enough	8.23 – 7.65 m	7.18m – 6.73 m	30	1.2
Not enough	7.65 – 5.90 m	6.73 – 5.36 m	20	0.8
Not enough very	< 5.90 m	< 5.36 m	10	0.4

Table 5. Norm of power and coordination of shoken test (Test Puslatda PON DIY 2020)

Category	AGE > 18 Years			Weight 7%
	Man	Woman	Score	Score
Very good	> 14.32 m	> 11.04 m	50	3.5
Well	11.76 – 14.32 m	11.04 – 9.34 m	40	2.8
Enough	11.76 – 10.49 m	9.34 – 8.49 m	30	2.1
Not enough	10.49 – 5.93 m	8.49 – 5.94 m	20	1.4
Not much	< 5.93 m	< 5.94 m	10	0.7

Table 6. Norma Expanding Dynamometer (Sukendro, S., & Indrayana, B. (2018))

Category	AGE > 18 Years		Score	Nobot 7%
	Man	Woman		Score
Very good	> 44.50 Kg	> 44.50 Kg	50	3.5
Well	34.00 - 44.00 Kg	31.50 - 44.00 Kg	40	2.8
Enough	25.00 - 33.50 Kg	20.50 - 31.00 Kg	30	2.1
Not enough	18.00 – 24.50Kg	10.50 - 20.00 Kg	20	1.4
Not much	< 17.50 Kg	> 10.00 Kg	10	0.7

Table 7. Norman Strength, Leg Dynamometer (Fenanlampir & Faruq 2015)

Category	AGE > 18 Years		Score	Weight 7%
	Man	Woman		Score
Very good	> 259 Kg	> 219.50 Kg	50	3.5
Well	187.50-159.50 Kg	171,50-219,50 Kg	40	2.8
Enough	127.50-187.50 Kg	127.50-171.50 Kg	30	2.1
Not enough	84.50-127.50 Kg	81.50-127.50 Kg	20	1.4
Not much	< 84.50 Kg	> 81.50 KGg	10	0.7

Table 8. Norms Strength Back And Leg Dynamometer (Fenanlampir & Faruq 2015)

Category	AGE > 18 Years		Score	Weight 7%
	Man	Woman		Score
Very good	> 153.50 kg	> 103.50 kg	50	3.5
Well	112.50-153.50 kg	78.50-103.50 kg	40	2.8

Enough	76.50-112.50 kg	57.50-78.50 kg	30	2.1
Not enough	52.50-76.50 kg	28.50-57.50 kg	20	1.4
Not much	< 52.00 kg	> 28.50 kg	10	0.7

Table 9. Endurance Norms, Pus Up 1 minute (Fenanlampir & Faruq Tes, 2015)

Category	**AGE > 18 Years**		**Score**	**Weight 7%**
	Man	**Woman**		**Score**
Very good	> 70	> 70	50	3.5
Well	54-69	54-59	40	2.8
Enough	38-53	35-53	30	2.1
Not enough	22-37	22-34	20	1.4
Not much	< 21	> 21	10	0.7

Table 10. Endurance norm, 1 minute sit-ups (fenanlampir & faruq, 2015)

Category	**AGE > 18 Years**		**Score**	**Weight 7%**
	Man	**Woman**		**Score**
Very good	> 54	> 47	5	3.5
Well	50-53	40-46	4	2.8
Enough	43-49	35-39	3	2.1
Not enough	36-42	30-34	2	1.4
Not much	< 31	> 24	1	0.7

Table 11. Endurance Norms (Wall Squat Test (left leg (Pye, 2005))

Category	**AGE > 18 Years**			**Weight 4%**
	Man	**Woman**	**Score**	**Score**
Very good	> 102 seconds	60 seconds	50	2
Well	102 - 76 seconds	60 - 46 seconds	40	1.6
Enough	75 - 58 seconds	45 - 36 seconds	30	1.2
Not enough	57 - 30 seconds	45 - 20 seconds	20	0.8
Not much	< 30 seconds	> 20 seconds	10	0.4

Table 12. Endurance Norms (Wall Squat Test (right leg (Pye, 2005))

Category	**AGE > 18 Years**			**Weight 4%**
	Man	**Woman**	**Score**	**Score**
Very good	> 102 seconds	60 seconds	50	2
Well	102 - 76 seconds	60 - 46 seconds	40	1.6
Enough	75 - 58 seconds	45 - 36 seconds	30	1.2
Not enough	57 - 30 seconds	45 - 20 seconds	20	0.8
Not much	< 30 seconds	> 20 seconds	10	0.4

Table 13. Norms of Aerobic Endurance Running Test 2.4 Km (Bafirman, B., & Wahyuri, AS (2019))

Category	**AGE > 18 Years**			**Weight 15%**
	Man	**Woman**	**Niai**	**Score**
Very good	< -10.45	< -13.30	50	7.5
Well	10.46-12.00	13.31-15.54	40	6

Enough	12.01-14.00	15.55-18.30	30	4.5
Not enough	14.01-16.00	18.31-19.00	20	3
Not much	> 16.01	> - 19.01	10	1.5

Table 14. Overall Norm

Category	**AGE** **18 years**
	Boy and girl
Very good	**41 - 50**
Well	**33 - 41**
Enough	**25 - 33**
Not enough	**18 - 25**
Not much	**10 - 18**

IV. Conclusion

Based on research that has been carried out through several stages, the conclusions of this study are as follows:

1. The research resulted in 12 compositions of physical test instruments for combat martial arts degrees in the martial sportcategory, which consisted of:
   (1) Flexibility test using side split, (2) speed test using 20 meter sprint, (3) agility test using hexagonal obstacle, (4) triple hupp jump leg power test, (5) power and coordination test using shoken test (6) strength test arm/hand using an expanding dynamometer (7) Test leg strength using a leg dynamometer (9) Test back strength using a back dynamometer (10) Test arm muscle endurance using push ups, 1 minute, (11) Test abdominal muscle endurance using sit ups 1 minute, (11) Leg muscle endurance test using the wall squat test, (12) Aerobic endurance test using a 2.4 km run. The test is declared valid
2. A manual for the physical test of fighting martial arts in the martial sportcategory has been made.
3. The book product of the physical test instrument for fighting martial arts in the martial sport category is declared valid with r count > from r table with details; 0.94 > 0.632 and the test was declared reliable with Cronbach's alpha value of 0.945 > 0.765. The physical test instrument product for Tarung Derajat has a feasibility percentage of 100% in the very strong / appropriate / appropriate category from a material expert and 100% very strong / appropriate / appropriate from a physical condition expert and 96% is included in the very strong / appropriate category / worthy of the coach's judgment.

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