

# Development And Measurement Testing Physical Condition For Badminton Athletes U-15

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**Abstract.** This research aims to produce physical test parameters for U-15 badminton athletes. Samples of this research are Djarum badminton club athletes of 13-15 years old total 27 men's athletes and total 23 women's athletes. Research method uses research and development (R n D) approach with analysis descriptive percentage technique. The result : the assessment from the expert with average score 4,59 (very good). Validitas : 1) *sit up* : 91,7 (very high) 2), *push up* : 83,3 (very high), 3) *balke*: 75 % (high), 4) *sit and reach* : 91,7 (very high), 5) *sprint 20 m* : 75 % (high), 6) *grip strength test* : 75 % (very high), 7) *court agility test* : 100 % (very high), 8) *vertical jump test* : 100% (very high) dan 3 *steps medicine ball throw test* : 91,7 % (very high). Reliability: 0,917. Conclusion: validity of 7 test items is very high category and 2 item test is high category, meanwhile the reliability is very high. So this parameters can be used in PB. Djarum auditions for U-15s.

**Keywords:** Parameters, Physical condition, Badminton athletes U-15

## 1. Introduction

One of the biggest badminton club in Indonesia is PB. Djarum Kudus. PB. Djarum Kudus held auditions annually, the goal is to get the seeds of potential athletes. Badminton audition system commonly uses *scout talent* approach. Below are the tests to pass audition in the PB. Djarum Kudus, there are: 1) technique test, 2) physical test, and 3) psychological test. Physical capacity of badminton athletes is important to qualify on the audition (Ricko Irawan, 2016), while according Hetti, (2010: 46) badminton athletes is very important to have degree of excellent physical condition, because physical is the foundation of sport achievement and also good physical can maintain consistency of someone's performance when competing.

Physical condition test is conducted to gain data, which from the data we can see physical capacity rate of badminton athlete. Here are some kinds of physical tests for badminton athletes: (a) flexibility test (sit and reach), (b) speed test (sprint 30 m), (c) leg muscle power test (vertical jump), (d) agility test (run 4 corners), (e) arm muscle power test (throwing a ball), (f) reaction test (step test), (g) endurance test (run 600 m) (Uuvi Hinda Zhannisa & FX. Sugiyanto 2015).

Futhermore, component and physical classification of badminton sport according to (Albertus Fenanlampir & Muhammad Muhyi Faruq, 2015:231) there are (a) strength test (*hand dynamometer, back dinamometer & leg dynamometer*), (b) muscle endurance test (*push up, sit up, squat jump*), (c) speed test (sprint 50 meter), (d) flexibility test (*flexometer*), (e) *power test (medicine ball put, vertical jump)*, and (f) heart and lungs endurance test (run 15 minutes VO<sub>2</sub>max). Meanwhile according to (Basri Yusuf, 2014:13) physical test for

badminton athletes has 6 test points, there are: (a) *endurance (VO2Max beep test)*, (b) *speed coordination (court agility test)*, (c) *power (vertical jump test)*, (d) *coordination (skipping rope test)*, (e) *core stability (sit-up test)*, (f) *strength (push up test)*.

PB. Djarum Kudus become a center of talented young athletes in the badminton sport were then recruited through this audition. Audition system is as an effort to increase human resources in Indonesia, especially in the field of sport, is the focus and orientation of sports development as early as possible by doing the coaching and development of sport for young people from an early age (Basri Yusuf, 2014: 10). In the preliminary observations, researcher conducts FGD (Focus Group Discussion) consisting of technical coaches, physical trainers, and IT experts related with audition systems in the PB Djarum Kudus badminton. In that discussion, obtained the finding that physical tests which are tested at PB. Djarum Kudus audition is still not specific to age categories U-15s badminton athletes. In addition, management value of physical tests are still done manually.

In this case the talented athlete identification activities in the PB. Djarum Kudus audition need software and physical test parameters for U-15 badminton athletes so it is expected that result of audition in PB. Djarum Kudus get seeds of potential athletes.

## 2. Methods

This study uses research and development (R & D) Sugiyono (2015: 407). The development of research used to produce a product of physical test parameters, and physical tests assessment software of U-15s badminton athlete. Physical test parameters include *sit-up test, push-up test, balke test, sit and reach test, sprint 30 meters, grip strength test, court agility test, vertical jump test, three step medicine ball throw test*.

The technique which is used is *purposive sampling*. It is selecting sample based on the criteria U-15s badminton at 13 -15 years old.

After doing the analysis, so the researcher conducts the developmental model or product by doing test that have been compiled before. After the model is created then the next step is a test of the variables which already determined by researcher in order to ensure the success of the product that would be created.

This study uses tests and measurements design as trial. The design of this trial through two phases, namely a small group of test PB. Pendowo Semarang, PB. Sehat Semarang and PB. Hammas Semarang consists of 20 people, 13 male and 7 female with time allocation 1 meeting, and a large group test about products assessment parameters of large-scale physical tests performed on athletes PB. Djarum total 31 people consists of 14 male athletes and 17 female athletes categorized U-15s aged 13-15 years with 1 time allocation meeting.

Trial was conducted to get some important informations about revision and how effective products and the benefits of the developed products. This trial use some of subjects, such as: (a) physical expert (Drs. Moh Nasution, M.Kes), (b) badminton coach (Drs. Hermawan Pamot R, M.Pd) (c) badminton coach (Tahron, S.Pd., M.Pd.), (d) IT expert 1 (Fransiska Suryaning Pertiwi, M.Kom), IT expert 2 (Rismowati, S.Pd, M.Si), and IT expert 3 (Mohammad Irham Akbar, S.Si).

### 3. Results and Discussion

The development of initial products were obtain from previous studies through interview, review literatures, and FGD (*Focus Group Discussion*).

Next, after getting information through research field, the researcher did review literature related with previous studies and hold FGD to get further data with Ricko Irawan 2014 research as orientation to arrange physical test parameters for U-15 badminton athletes.

Previous research was about profile of PB Djarum athletes' physical condition which produce 6 physical test categorizes to evaluate physical condition of female athletes to Pelatnas. Below were the results of previous research: (1) endurance measured with *beep test*; (2) speed measured with *court agility*; (3) power measured with *vertical jump*; (4) coordination measured with *skipping rope*; (5) abdominal muscle strengh measured with sit up and (6) strengh endurance measured with *sit up*.

Those 6 test items were used as researcher orientation to develop initial products which have been disscussed with some experts in FGD before. Some experts who was invited in FGD were 6 people: 3 badminton experts and 3 software experts

After doing small scale trial, the researcher did field trial. It could be seen in the table below:

**Tabel 1.** The results of badminton coach assessment about product significance with physical test assessment parameters.

No.	Aspek yang dinilai	Parameter tes	Skala penilaian					Jumlah responden
			5	4	3	2	1	
1			1	2				3
2			2	1				3
3			2	1				3
4			1	2				3
5			2	1				3
6			2	1				3
7			2	1				3
8			2	1				3
9			2	1				3
		total	16	11				27
		percentage	59	41				100 %

Based on the large scale trial of U-15 badminton athletes physical test parameters on table 1 showed that total value from scale 5 (excellent) were 16 with total percentage 59%. Beside that. total value of scale 4 (good) were 11 with total percentage 41%. So, it can be concluded from large scale trial to physical test parameters about arrangement of badminton physical test instruments for U-15s has high significance. The validity of physical test parameters reviewed from *sit up* test with percentage 91,7 % valid, *push up test* with percentage 83,3 % valid, *balke test 15 menit* with percentage 75 % valid, *sit and reach* test with percentage 91,7 % valid, tes *sprint 20 m* with percentage 75 % valid, tes *grip dynamometer* with percentage 75 % valid, tes

*court agility* with percentage 100 % valid, *vertical jump* test with percentage 100 % valid, *midicine ball test* with percentage 91,7 % valid. The realibility of those 9 test items valued 0.974 could be said the reliability is very high.

The comparation between *sit up* test of 13-15 years old PB. Djarum athletes and *sit up* test of 13 – 15 years old Pengcap PBSI Pekalongan athletes. on Panji Mardiko research (2010:46). PB. Djarum athletes have average sit up test 69.5 meanwhile PBSI Pekalongan athletes have average sit up test 32. 71. Based on the result. it can be concluded that quality of abdominal muscle endurance PB. Djarum athletes is better than Pengcap Pekalongan athletes. Research result of Catur Magalhaes (2013) also stated that male badminton athletes of PB. Remaja Rembang regency age 14-16 years old have average sit up test 22.6 and deviation standard 3.05. If it was compared with PB. Djarum athletes who have average sit up test 69.5 and deviation standard 19.19. It could be concluded that quality of abdominal muscle endurance PB. Djarum athletes is better than PB. Remaja Rembang athletes.

In the research of Rona Lageayem. *push up* test has validity contribution 0.719 and reliability 0.632. if it was compared with validity *push up* test PB. Djarum 0.833 and reliability 0.974 means that validity and reliability of PB. Djarum athletes are more convincing rather than other badminton athletes.

On aji kusuma's research. the average endurance of PB. Bintang timur athletes aged 11-14 years old was 38.87. It was compared with aerobic endurance of PB. Djarum was 54.27. It reveals that the average endurance of PB. Djarum athletes is higher. so physical test endurance is appropriate to become physical test parameters.

The research of Giri Prayogo. flexibility gave great contribution 48.81% towards lob. it was related with physical test of PB. Djarum on *sit and reach* test which  $v = 0.917$  and  $r = 0.974$ . Means it is appropriate when flexibility become one of physical test parameters on the competition of entering PB. Djarum athletes.

Madsen research. The elite group was significantly faster in the badminton-specific speed test with a best time of  $32.3 \pm 1.1$  seconds compared with the skilled players ( $34.1 \pm 2.0$  seconds) and non-badminton players ( $35.7 \pm 1.7$  seconds). whereas there were no differences between groups in the 30-m sprint test. It can be concluded that PB. Djarum athletes are special athletes which have been selected strictly. So. the result of physical test Djarum athletes is appropriate to be used as physical test parameters.

Grip strength has high significance on playing badminton. As stated in the study of Javian Abier Viven that grip muscle strength contributes to badminton. Male grip strength greater than female grip strength and dominant hands has greater power than non dominant hands. It can be concluded that tests of strength could be used in arrangement of PB. Djarum physical test parameters.

Zhannisa Utvi research said the average of agility at Ukm PGRI athletes 15.20 to 16.19. When compared with the average of agility test at PB Djarum athlete was 11.35. So the agility quality of PB. Djarum athletes is higher than Ukm PGRI athletes. We can conclude the results of agility physical tests PB. Djarum athlete can be used as parameter for auditions enter PB. Djarum athletes aged 13-15 years old because it has high standard.

Ishak Muhammad research strengthens the validity and reliability of explosive power test which obtained from PB. Djarum athletes was  $r = 0.974$  and  $y = 0.917$ . In this study. obtained the explosive power contribution to badminton smash was 69.4%. See the contribution. we can conclude that there is significant correlation between the test results of explosive power PB. Djarum athlete at the age of 13-15 years.

Heri Yogo Prayadi research explained there was significance between arm power and badminton training methods. For the category of high arm power. the appropriate training

method was drilling method and lower arm power was appropriate using playing method. This means that arm power could be used in arrangement of physical test parameters.

#### **4. Conclusion**

Has composed parameters of physical test for U-15s badminton athletes aged 13-15 years in order to enroll the audition of PB. Djarum Kudus with assessment component as follows: *sit up. push up. balke test 15 minutes. sit and reach. sprint 20 meter. grip strength test. vertical jump test. 3 steps medicine ball throw test. & court agility test.* As well as a reference national athletes in the assessment and measurement of the physical condition at the age of 13-15 years.

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