

The Development of Physical Parameters and E-Report Physical Condition Software For U-15 Badminton Athletes

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Abstract

The identification for talented athletes in Djarum Badminton Club audition is necessarily needed to measure physical test parameters for under 15 years old players. Therefore, it could be expected to have the potential talents. This research aims to produce physical parameters test for U-15 badminton athletes. Samples of this research are Djarum Badminton Club athletes of under 15 years old. Research method uses research and development (R n D) approach with analysis descriptive percentage technique. The results : the assessment from the expert with average score 4,59 (very good). Validity : 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) and 3 steps medicine ball throw test : 91,7 % (very high). Reliability: 0,917. Conclusions: validity of 7 test items is very high category and the 2 test items is high category, meanwhile the reliability is very high. So this parameters can be used in Djarum Badminton Club auditions for U-15s.

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INTRODUCTION

One of the biggest Kudus held auditions commonly uses scout talent approach. Below are the tests to pass audition in the Djarum Badminton Club, there are: 1) technique test, 2) physical annually, the goal is to get the seeds of potential athletes. According to Harsono (2014:20) formation on younger athlete and our champions future. meanwhile, the research of Prpto Nugroho (2014), formation aims to carry out and choose a candidate of talented and potential athlete to be organized based on the need of sport field. Badminton audition system test, and 3) psychological test. Physical capacity of badminton athletes is important to qualify on the audition, 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) (Utvi Hinda Zhannisa & FX. Sugiyanto 2015)[3].

Futhermore, component and physical classification of badminton sport according to (Albertus Fenanlampir & Muhammad Muhyi Faruq, 2015:231)[4] 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 VO₂max). Meanwhile according to (Basri Yusuf, 2014:13)[5] 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).

Djarum Badminton Club become a centre 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 Djarum Badminton Club audition is still not specific to age categories U-15s badminton athletes. In addition, management value of physical tests are still done manually.

METHODS

In this case the talented athlete identification activities in the Djarum Badminton Club audition need software and physical test parameters for U-15 badminton athletes so it is expected that result of audition in Djarum Badminton Club get seeds of potential athletes. This study uses research and development (R & D) Sugiyono (2015: 407)[6]. 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, later 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 used 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). The development of initial products were obtain from previous studies through interview, review literatures, and FGD (Focus Group Discussion).

RESULTS AND 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 strength measured with sit up and (6) strength endurance measured with sit up. Those 6 test items were used as researcher orientation to develop initial products which have been discussed 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:

Table 1. Assessment of National Coach about Product Significance with Physical Test Assessment Parameters

No.	Aspects	Test parameters	Assessment Scale					Total respondent
			5	4	3	2	1	
1	Abdominal muscle endurance	Sit up	1	2				3
2	Arm muscle endurance	Push up	2	1				3
3	VO2Max endurance	balke	2	1				3
4	Flexibility	Sit and reach	1	2				3
5	Speed	sprint 20 meter	2	1				3
6	Strength	Grip strength tes	2	1				3
7	Agility	Court agility	2	1				3
8	Leg muscle explosive power	Vertical jump test	2	1				3
9	Arm muscle explosive power	Three step medicine ball throw	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.

Table 2. The Results of National Coach Assessment about Product Significance with Physical Test Assessment Parameters.

No	Subject	Average	Validity	Reliability	Classifications
1	Sit up	69.50	0.917	0.974	Very good
2	Push up	32.07	0.833	0.974	Very good
3	Balke 15 menit	54.27	0.75	0.974	Good
4	Sit and reach	9.11	0.917	0.974	Very good
5	Sprint 20 m	3.45	0.75	0.974	Good
6	Grip dynamometer	41.78	0.75	0.974	Good
7	Court agility	11.35	1.00	0.974	Very good
8	Vertical jump	46.07	1.00	0.974	Very good
9	Medicine ball	6.46	0.917	0.974	Very good

The comparison 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 (2011:46)[7]. 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)[8] 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 (2018)[9]. 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[10]. 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[11]. 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. Meanwhile, Madsen research (2016)[12]. The elite group was significantly faster in the badminton-specific speed test with a best time of 32.3 ± 1.1 seconds compared with the skilled players (34.1 ± 2.0 seconds) and non-badminton players (35.7 ± 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. Thus, the result of physical test Djarum athletes is appropriate to be used as physical test parameters. In addition, 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 (2018)[13] 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 (2011)[14] 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.

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.

Table 3. The Result of IT Expert Assessment about Product Significance of Physical Test Software

No	Aspects	Assessment scale					Total respondent
		5	4	3	2	1	3
1	Software appearance is interesting	2					3
2	Software application is easy	2					3
3	Software help coaches to get criteria about physical test result of badminton athletes			2			3
4	Software do its functions well	2					3
5	Selecting icon at software is appropriate with its function	2					3
6	Layout design of software is appropriate	2					3
Total		11	7				27
Percentage		61%	39%				100%

Table 4. Conclusions of IT Expert Assessment about Product Significance of Physical Test Software

No	Subjects	Answers quality	Conclusion	Classification	Meaning
1	Tampilan <i>Software</i> menarik	91.7	valid	very good	used
2	Penggunaan <i>Software</i> mudah	91.7	valid	very good	used
3	<i>Software</i> memudahkan pelatih untuk mendapatkan kriteria hasil tes fisik atlet bulutangkis	75	valid	good	used
4	<i>Software</i> menjalankan fungsi nya dengan good	91.7	valid	very good	used
5	Pemilihan ikon pada <i>software</i> sudah sesuai fungsinya	100	valid	very good	used
6	Desain tata letak <i>software</i> sudah sesuai	91.7	valid	very good	used

Based on the large scale trial of physical test software product for U-15s badminton athletes can be showed by total value of scale.

Total value of scale 5 (excellent) was 11 with percentage 61 %. Meanwhile. total scale 4 (good) was 7 with total percentage 39 % The validity of physical test software product From software appearance with total percentage 91.7 % valid. software application with percentage 91.7 % valid. software helped coaches to get criteria about physical test result of badminton athletes with percentage 75 % valid. software did its function well with percentage 91.7 % valid.

selecting icon at software was 100 % valid. layout design of software was appropriate with percentage 75 % valid.

CONCLUSION

Has composed parameters and software 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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