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Content Validity of Arm Power Special Test for table Tennis Playing Skills

Gilang Brilianandа[1], Tomoliyus[2]

[1,2]Address Sports Coaching Education Study Program, Yogyakarta State University, Road Colombo, Yogyakarta,Indonesia

ABSTRACT: The objective of this research is to produce an arm power test construction in table tennis as well as to test the content validity. This research refers specifically to the mixed method (mixed method). The research subjects for the assessment of arm power test in table tennis playing skills were based on the assessment of 7 experts with a scale of 4 and a significance level of 5%. The data analysis technique utilized Aiken V. Based on the assessment of the instrument by experts, the value in the Aiken V table is at 0.76. The results of the content validity test with Aiken V for arm power test gains the score at 0.857 which means the instrument is valid. Hence, the arm power test instrument can be an alternative to the table tennis test and needs to be tested further. The results are obtained by the analysis of the content validity of the arm power test. The AIken V arm power indicator for the seven validators at the critical one-sided significance level means that the arm power test instrument is valid. Subsequently, it can be concluded that the construction of the arm power test and specifically for table tennis has been found to have high content validity

KEYWORDS: Content validity, arm power, table tennis, skills, test

I. INTRODUCTION

The performance of table tennis athletes in winning matches is largely determined by good skill, mental and physical abilities(Ak & Koçak, 2010; Akpinar, Devrilmez, & Kirazci, 2012; Chu, Chen, Chen, Huang, & Hung, 2012; Kondrič, 2012; Zagatto, & Sekulić,2013; Liu, Zhou, Ji, & Watson, 2012; Lopez & Santelices, 2012).

"In playing table tennis, there are several basic stroke skills, including: Forehand, Backhand, Drive, Push, Chop, Block, Service, Spin" (Hasan, et al. 2012). The meaning of each of these techniques is: 1) Forehand is a shot where the ball is on the right side of the body, 2) Backhand is a shot where the ball is on the left side of the body, 3) Drive is a shot with a long swing resulting in a punch. hard and flat, 4) Push is a passive backspin shot that keeps the ball from soaring too high, 5) Chop is a defensive backspin shot, 6) Block is a fairly hard ball return technique, 7) Service is hitting the ball to serves the first ball, 8) Spin is a ball hit whose direction is clockwise (Hasan, et al. 2012). In training and in matches, the problem that athletes often face is poor quality smash or spin techniques for forehands and backhands that are easily returned by opponents.

The physical component is an important aspect in improving the performance of table tennis athletes. The physical components of table tennis athletes include: Components in the physical condition of table tennis athletes include power, endurance, flexibility, speed. and coordination, as stated by Larry Hodges (Liskustyawati, 2016). Athletes who have good physique will be superior in mastering techniques and tactics, so that in their implementation, good physique will support technique and tactics so that it can prevent an athlete from experiencing injury. Therefore, power is one of the most important characteristics for athletes in competitive sports, including table tennis (Kraemer & Looney, 2012).

*Power*is an optimization of muscles to obtain the necessary force to be exerted at speed (William J. Kraemer & David P. Looney: 2018). Apart from that, Power is wrong if it is used as a measure of strength, associated with certain athletes (Winter et al. 2016). strength is an important characteristic of human exercise performance, responsible for the success of performing various functional movements for example, jumping, running, throwing, kicking (Dragan Mirkov: 2013: 56)

*Power*is very important because strength can provide something valuable about an athlete's performance, because it is the mechanical principle of the speed at which an athlete performs work that can transfer energy to complete a movement (E. van der Kruk, van der Helm, Veeger: 2018) then power is usually limited by the capabilities of the measurement system, resulting in the use of simplified force models (E. van der Kruk, van der Helm, Veeger: 2018). Strength can influence playing technique (Lockie, RG,

Murphy, AJ, Schultz, AB, Knight, TJ, and Janse de Jonge, XA : 2012 : 1540)

Meanwhile, in table tennis power is very important because higher level players are found to be able to better utilize the power of the arms and wrist joints through the whole body kinetic chain to produce a fuller top spin (Wai-Chi Wong Duo Winson Chiu-Chun LeeandWing-Kai Lam: 2020 :1), and also players with higher technical ability coordinate movements better with controlled attack power, and use power to generate sufficient ball speed and spin in a limited time (Wai-Chi Wong Duo Winson Chiu-Chun LeeandWing-Kai Lam: 2020 :2) To measure power, you can use the CAMRY hydraulic hand dynamometer test tool to measure hand grip strength which is assessed using (range 0-90kg; accuracy 0.1kg), which has an adjustable handle to take into account various hand sizes (Pedro ÁngelLatorre Román, David Mora López , Beatriz Berrios Aguayo, Alejandro Robles Fuentes, Felipe García Pinillos, Melchor Martínez Redondo : 2017), and there is also grip power measured with high precision dynamometry in healthy conditions for ages from 5 to80 years (Hogrel, J.-Y : 2015) .

Then specifically for the arm muscles, use an Electronic Push/Pull Dynamometer (EPPD) to measure the extensor and flexor muscles to determine arm power. The Electronic Push/Pull Dyna-meter (EPPD) is a handheld dynamometer, which has gained popularity in measuring muscle strength in clinical practice due to its simplicity and objectivity (Mikhled F ,Mohammad D, Saad S, Ali H,Emad T, Amr A, Gopichandran Lakshmanan, Nabeel A. Mohsen B, Yaser OM : 2012)

In the training process, arm power and agility tests are required for assessment purposes. The arm power test to measure the arm power of a table tennis player is still common, namely using the Two-Hand Medicine Ball Test. From the explanation that has been explained, the Two-Hand Medicine Ball test shows how to measure arm power using both arms by pushing as far as possible. This is not in accordance with the way of playing table tennis.

Therefore, the arm power test for table tennis needs to be developed according to what is appropriate when carrying out the movements contained in the skill of playing table tennis.

METHODOLOGY

This research uses a mixed method. A mixed method is a method that uses a combined qualitative and quantitative approach (Creswell, 2013: 5). Apart from that, a mixed research method is a research method that combines both qualitative and quantitative research approaches in a research activity, so that it will obtain more comprehensive, valid, reliable and objective data (Sugiyono, 2012:18). This research was carried out using online media, namely filling out a test questionnaire that I distributed, on December 19 2020. The targets and subjects of this research were experts, namely there were 7 validators including; 2 UNY lecturers, and 5 table tennis coaches. The aim is to measure the power explosion (explosion strength) of the table tennis arm. Equipment tools: a) Ballmedicine weighing 1.5 kg, b) Ballpoint pen and form, c) Flat field with boundaries d) Chair, e) Roll meter, f) Belt. Officer: a) Boundary supervisor and recorder of results. b) Monitoring the fall of the ball and measuring the repulsion distance. Implementation: a) Testi sit in a chair behind the boundary line, holding the ball with one dominant hand. b) Sitting in a chair 50 cm high, ready and with a body that has been given a belt attached to the chair, the right hand starts from behind by holding the ball, the waist is rotated 45°, then throws it with one hand from the right side by making a forehand shot. as far ahead as possible. a) The testis are given a rest of 1-3 minutes. b) The test is carried out twice by throwinga forehand. c) Calculate the throwing distance from the boundary line to the ball closest to the boundary line. d) The throwing distance is recorded to the full cm. 5) Assessment: a) The farthest throwing distance is calculated. b) The throw is declared a failure if the ball is not thrown from the side with one hand which is often used on the right or left.

II. RESULTS AND DISCUSSION

A. *Descriptive Results of Table Tennis*

Data collection techniques in this research are documentation and questionnaire methods. The instrument used to measure arm power is validated by experts

B. *Data Analysis Test Results*

The research subjects for assessing arm power tests in table tennis playing skills used 7 experts with a scale of 4 and a significance level of 5%. The data analysis technique uses Aiken V. Based on the instrument assessment by experts, the value in the Aiken V table is 0.76. The research results of the content validity test with the Aiken V for the arm power test were obtained at 0.857, which means the instrument is valid

Table 2. Test Data Analysis

Tabel 2. Hasil Penilaian Tes Power Lengan

Penilai	Aspek 1		Aspek 2		Aspek 3		Aspek 4		Aspek 5	
	Skor	S	Skor	S	Skor	S	Skor	S	Skor	S
1	4	3	3	2	4	3	4	3	3	2
2	4	3	4	3	4	3	4	3	4	3
3	4	3	4	3	4	3	4	3	4	3
4	4	3	4	3	3	2	3	2	4	3
5	4	3	3	2	4	3	3	2	4	3
6	4	3	4	3	3	2	4	3	4	3
7	3	2	3	2	3	2	4	3	3	2
∑S		**20**		**18**		**19**		**19**		**19**
V		**0,9524**		**0,8571**		**0,9048**		**0,9048**		**0,9048**

Based on the results of Table 7 and Aiken's V Table, the first aspect gets a V value of 0.952, the second aspect gets a V value of 0.857, the third aspect gets a V value of 0.904, the fourth aspect gets a V value of 0.904, the fifth aspect gets a V value of 0.904. So it can be said that each aspect of the assessment includes high validity. Thus, this arm power test instrument has a high level of expert agreement and can be used to test tennis arm power.

C. DISCUSSION

This study Arm strength in table tennis is an important thing that athletes need. The role of arm power in table tennis is needed in a match. When competing, athletes need arm strength to produce a top spin and hit the ball as hard as possible. The movements carried out by athletes are not always the same and can change. So, having good arm power can produce top spin and slap the ball hard, so that athletes are more stable when carrying out activities in a match. This is in accordance with what was stated by Bańkosz and Winiarski (2017) who reported that the maximum speed of the bet when the ball is about to impact, one of the keys may be arm power, Successful table tennis playing technique depends on the ability to master arm strength in repeated table tennis strokes. The test will be carried out in consultation with experts to obtain the results of the content validity of an instrument. According to (Miller MJ, 2015: 7, Sangoseni O, Hellman M, Hill C, 2013: 2641 – 2647) content validity is related to the extent to which the instrument assessor measures the instrument as appropriate or not.

V. CONCLUSION

Based on data analysis, description, testing of research results, and discussion, it can be concluded that:
The results of the instrument assessment by 7 raters were obtained: the first aspect got a V value of 0.952, the second aspect got a V value of 0.857, the third aspect got a V value of 0.904, the fourth aspect got a V value of 0.904, the fifth aspect got a V value of 0.904. The results of the content validity test with Aiken V mean that the instrument is valid or has good validity because the V value for each aspect is > 0.76 and can be used as an alternative to the table tennis arm power test.

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