

## Anaerobic Power for Wrestlers

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**Abstract:** The aim of this study is to first, Design a test to measure anaerobic power for wrestles. Second, Put Normative degrees to anaerobic power for wrestlers. The researcher has used the descriptive methodology that fits the study objectives in applying the throwing medicine ball (3kg) backwards test on a sample of 30 male wrestlers from the Egyptian national team for Greco-Roman wrestling and freestyle wrestling in order to measure anaerobic power for wrestlers. The results of this study were first, The throwing medicine ball (3kg) backwards test to measure the general anaerobic power for wrestlers has achieved a high test validity that ranges between (0.84- 0.81) with the vertical jump test and 50 yards sprint as a criterion. Second, The test has a high discriminatory ability. Thirdly, throwing the medicine ball (3kg) backwards test to measure the general anaerobic power for wrestlers has achieved a high reliability coefficient of 0.87. Fourthly, standard score of the relative anaerobic power can be extracted from the standard degrees tables in the terms of weight and distance.

**Key words:** ANP • ANC • Throwing medicine ball backwards

### INTRODUCTION

The development, wrestling witnessed in the recent years, came as a result of harnessing other sciences and its applications for increasing the effectiveness of training in order to enable the athlete to achieve the best achievements. The continuous objective assessment for the programs and media used in training helps in a real evaluation for the athletes performance level.

Allawy and Radwan [1] and Ahmed [2] agree that tests and measurements are of the most important means of evaluating athletes' performance in general, either standing on their general or particular physical capabilities for the specialized activities they practice, or acknowledging the strength and weakness points and the extent of progress for individual performance in programs and also determine the attributes and characteristics of the player in terms of kinetic, physical, mental and social aspects as well as to determine the level of performance for the player.

Evaluation, in the field of sport training, plays a positive role in raising the level of performance either in senior level or junior level. Evaluation is a process that judges the measurements results and objective tests in the light of specific considerations for the performance specifications [2, 3].

As well known, many sport and physical activities depend on an aerobic energy source resulting from chemical analysis of Adenosine tri phosphate and phospho creatin (pc) or muscle glycogen, as anaerobic physical work do not depend on transporting or extracting oxygen by Cardiovascular and respiratory systems but depends on energy resources that are already in muscles [4].

Allawy and Abd El-Fattah [5] state that wrestling is one of the sports in which physical capabilities have a main role (key role) in the process of preparing athlete for the championship where it enables him to achieve a good level of achievements through a comprehensive development for the physical, psychological, tactical skill, physiological aspects, as well as developing aerobic and anaerobic capacity on which wrestler depends on in his major activity.

El- Gebaly [6] adds that wrestling depends on both aerobic and anaerobic energy system, but anaerobic energy production system is the predominant at work.

Anaerobic energy production in body during physical activities can be divided into two aspects:

**Aerobic Power (ANP):** It is the highest rate where energy production occur, or it is working without any contribution or impact of aerobic energy, or it is the muscle ability to work for producing anaerobic energy [7].

**Anaerobic Capacity:** It is the ability to keep the violent muscles contraction that depends genuinely on anaerobic mechanism in providing energy [4].

Anaerobic capacity can be divided into 3 categories according to variables of time where it can be used in measurements:

**Short-Term Anaerobic Capacity:** It includes sport performance which continues for short period about 10 seconds or less. This kind of short-term anaerobic capacity tests aims at measuring the efficiency of anaerobic muscles without lactic acid, depending mainly on the ATP (Adenosine tri phosphate) concentration in muscle and anaerobic phosphorus system. This is often happening in the muscular performance which is characterized by speed and the maximum power and activities with explosive strength.

**Intermediate Anaerobic Capacity:** In this kind of anaerobic capacity, the time period to perform muscle work ranges between 20-50 sec. where this period allows for the lactic anaerobic abilities which depend on lactic acid system represented in breaking down glycogen in the absence of oxygen, to produce about 70% of anaerobic energy, whereas aerobic energy contributes by about 30%.

**Long Intermediate Anaerobic Capacity:** It refers to the total work produced during performing maximum physical effort. The time period ranges between 60-120sec. where performance in this case depends on aerobic and anaerobic energy production systems [4, 8, 9].

One of the tests used in measuring anaerobic power is Margeria Staircase test, 1966 (Mgeria design) to measure the muscular power of legs, then this test is modified by Kalamen to be Margeria and Kalamen stair climb test, 1968 [4].

The problems that were and still obstructing impeding the application of this test are that the test performance is affected by the fear factor of climbing the stair, as well as the test requires special device to measure time from stair to another.

Also Johnson and Nelson [10] used vertical jump test to measure anaerobic power, which also requires particular device to measure the time of the jumping player, or using equation that does not refer to the unit of measurement.

One of the defects of these tests that they are general and require good coordination that make it difficult for

the beginners to perform, as these tests have an old standards that may do not match with the existed abilities.

Thus, the idea of this research aims for designing a test to measure anaerobic power for wrestlers by throwing a medicine ball backwards in the direction of muscular work during performing the great technical skills like curvature skills backwards, for the participation of largest muscular groups during its performance in simple way through the application field and also extracting Normative standard score of anaerobic power for the wrestlers and Putting Normative degrees to anaerobic power for wrestlers.

## MATERIALS AND METHODS

The researcher used the descriptive methodology that fits the study objectives.

The research has been carried out on a sample of 30 male wrestlers deliberately selected from Egyptian national team for Greco-Roman wrestling and freestyle wrestling Table 1 shows that Torsion coefficient ranged between -0.98 and 0.71 that is confined between  $\pm 3$ . This refers to the homogeneity of sample research in this variable.

### Instruments Used in the Research

**Vertical Jump Tests:** The purpose of this test is to measure anaerobic power, where Johnson and Nelson, 1974 registered the coefficient validity which was 0.78 calculated by comparing between the test results and the total degrees of four competitions of the field and track. Also Considine and Sullivan, 1973 mentioned that the test is valid as a measure of short anaerobic power because its results shows statistical function correlation relationships with sprint time in short distances, while Johnson and Nelson, 1974 registered stability coefficient for the test which was 0.93 through repeating the test. In a study of Considine and Sullivan, 1973 stability coefficient was 0.99 when they re-applied the test on a sample from university students [4, 10].

**Sprint Test "50 Yards":** This test is used to measure the short anaerobic power where a close relation was found between this test and Margaria -kalamen power test (climbing stair test) where the correlation coefficient was 0.974 [7].

As studies -made in the field of biochemistry - have shown that this test depends largely on the rates of departure and synthesis of ATP and PC [4].

Table 1: Torsion coefficient of variables (Age, height, weight, vertical jump and 50 yards sprint)

Variables	Measurement Unite	Mean	SD±	Median	Skew
Age	y	22.73	2.26	23.00	- 0.36
height	cm	80.68	17.53	76.05	0.79
weight	kg	174.78	7.56	177.25	- 0.98
vertical jump	cm	57.01	3.99	57.59	- .71
50 yards sprint	Per sec.	8.83	0.55	8.70	0.71

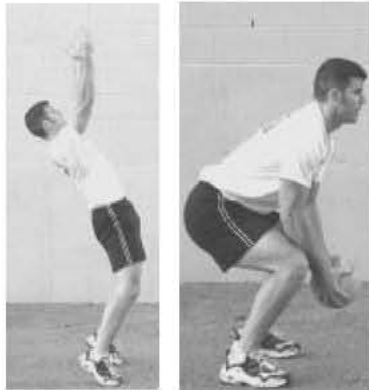


Fig. 1:

#### Throwing a Medicine Ball (3kg) Backward:

It was designed by the researcher (Fig. 1)

**Purpose:** Measure anaerobic power for wrestlers

#### Instruments:

- Medicine ball (3 kg).
- Medicine scale to weigh player.
- Distance measuring tape.
- Chalk to draw starting line with 1 m length and 5cm width.

#### Performance Description:

- Player makes a good warm up.
- Player stands on the starting line, holding the medicine ball in front of his body.
- Player places his ankles on the starting line with an appropriate opening legs.
- Player bends the knees with leaning the trunk forward.
- Player swings the ball by arms forwards and backwards between the feet.
- Player throws the medicine ball backwards as far as possible by stretching the trunk and the head up and behind.

- Player is allowed to lift his ankles from the ground fixing his insteps during throwing the ball backwards.

#### How to Register:

- Calculating the distance, from starting line until the first point of the falling medicine ball.
- Player is allowed to do 3 attempts and record the best one.
- Calculating the distance to the nearest centimeter.
- Power is calculated by kilogram meter per second by the following equation.

$$P = F \cdot V \text{ kgm/sec.}$$

$$F = w \text{ ball}$$

$$V = \sqrt{2 \cdot 9.81 \cdot d}$$

- The following equation is used to calculate relative anaerobic power Power ratio =  $(P \cdot W \text{ player}) \cdot 100$ .

## RESULTS AND DISCUSSION

#### Scientific Factors of the Test

**First: Test Validity:** The researcher had calculated test validity related to the criterion by applying throwing medicine ball (3 kg) test, as well as the vertical jump test and 50 yards sprint on 30 male wrestlers from the Egyptian national team of Greco- Roman wrestling and freestyle wrestling. The test can measure anaerobic muscular power for wrestlers.

Table 2 shows that the value of calculated "R" between throwing medicine ball (3kg) backwards test and vertical jump test and 50 yards sprint is greater than its statistical value in the table indicating that there is a strong correlation between throwing medicine ball backwards test and the vertical jump test which was 0.84 as well as throwing medicine ball backwards test and 50 yards sprint which was 0.81. This correlation indicates that throwing medicine ball backwards can measure anaerobic muscular for wrestlers1.

Also the researcher calculated the test validity using differentiation validity by applying the test on 30 wrestlers from the Egyptian national team of Greco-Roman wrestling and freestyle wrestling.

Table 2: Correlation coefficient between throwing medicine ball (3 kg) test and vertical jump test and sprint 50 yards

Throwing medicine ball		Vertical jump		R	Sprint 50 yards		R
Mean	SD	Mean	SD	0.84	Mean	SD	0.81
14.70	1.50	57.01	3.99		8.83	0.55	

Statistical R=0.361 on the significant (indicative) level 0.05

Table 3: The upper and lower quartile of throwing medicine ball backwards test

Upper quartile N=10		Low quartile N=10		T-test
Mean	SD	Mean	SD	14.80
16.40	1.03	13.22	0.55	

Statistical T= 2.101 on the significant indicated level 0.05

Second: Tests Reliability

They were put in a concession arrangement according their degrees in the test in order to calculate the differences between the upper and low quartile of the players degrees in this test.

Table 3 shows that the value of calculated (T) is greater than its statistical value, this indicates that this test can differentiate between the individuals of the research sample.

Table 4: The correlation coefficient between the first application and the second application of throwing medicine ball (3 kg) test

First application		Second application		R
Mean	SD	Mean	SD	0.87
14.70	1.50	14.87	1.56	

Statistical "R" = 0.361 on the significant level 0.05

**Second: Tests Reliability:** The researcher has calculated the test reliability by applying the test on 30 wrestlers of Egyptian national team of Greco-roman wrestling and freestyle wrestling and after a weak reapplied it again.

Table 4 show that the calculated value of (R) is greater than its statistical value which indicates that test is reliable and highly objective.

Table 5:

Player weight	Distance of throwing medicine ball 3 kg backwards																
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
26	114.2	125.1	135.2	144.5	153.2	161.5	169.4	177.0	184.2	191.1	197.8	204.3	210.6	216.7	222.7	228.4	
27	110.0	120.5	130.1	139.1	147.6	155.6	163.1	170.4	177.4	184.1	190.5	196.8	202.8	208.7	214.4	220.0	
28	106.1	116.2	125.5	134.2	142.3	150.0	157.3	164.3	171.0	177.5	183.7	189.7	195.6	201.2	206.8	212.1	
29	102.4	112.2	121.2	129.5	137.4	144.8	151.9	158.7	165.1	171.4	177.4	183.2	188.8	194.3	199.6	204.8	
30	99.0	108.4	117.1	125.2	132.8	140.0	146.8	153.4	159.6	165.7	171.5	177.1	182.5	187.8	193.0	198.0	
31	95.8	104.9	113.4	121.2	128.5	135.5	142.1	148.4	154.5	160.3	165.9	171.4	176.6	181.8	186.8	191.6	
32	92.8	101.7	109.8	117.4	124.5	131.3	137.7	143.8	149.6	155.3	160.7	166.0	171.1	176.1	180.9	185.6	
33	90.0	98.6	106.5	113.8	120.7	127.3	133.5	139.4	145.1	150.6	155.9	161.0	165.9	170.8	175.4	180.0	
34	87.3	95.7	103.4	110.5	117.2	123.5	129.6	135.3	140.8	146.2	151.3	156.3	161.1	165.7	170.3	174.7	
35	84.9	93.0	100.4	107.3	113.8	120.0	125.9	131.5	136.8	142.0	147.0	151.8	156.5	161.0	165.4	169.7	
36	82.5	90.4	97.6	104.3	110.7	116.7	122.4	127.8	133.0	138.0	142.9	147.6	152.1	156.5	160.8	165.0	
37	80.3	87.9	95.0	101.5	107.7	113.5	119.1	124.3	129.4	134.3	139.0	143.6	148.0	152.3	156.5	160.5	
38	78.2	85.6	92.5	98.9	104.9	110.5	115.9	121.1	126.0	130.8	135.4	139.8	144.1	148.3	152.4	156.3	
39	76.1	83.4	90.1	96.3	102.2	107.7	112.9	118.0	122.8	127.4	131.9	136.2	140.4	144.5	148.4	152.3	
40	74.2	81.3	87.8	93.9	99.6	105.0	110.1	115.0	119.7	124.2	128.6	132.8	136.9	140.9	144.7	148.5	
41	72.4	79.3	85.7	91.6	97.2	102.4	107.4	112.2	116.8	121.2	125.5	129.6	133.6	137.4	141.2	144.9	
42	70.7	77.5	83.7	89.4	94.9	100.0	104.9	109.5	114.0	118.3	122.5	126.5	130.4	134.2	137.8	141.4	
43	69.1	75.7	81.7	87.4	92.7	97.7	102.4	107.0	111.4	115.6	119.6	123.5	127.4	131.0	134.6	138.1	
44	67.5	73.9	79.9	85.4	90.6	95.5	100.1	104.6	108.8	112.9	116.9	120.7	124.5	128.1	131.6	135.0	
45	66.0	72.3	78.1	83.5	88.5	93.3	97.9	102.2	106.4	110.4	114.3	118.1	121.7	125.2	128.7	132.0	
46	64.6	70.7	76.4	81.7	86.6	91.3	95.8	100.0	104.1	108.0	111.8	115.5	119.0	122.5	125.9	129.1	
47	63.2	69.2	74.8	79.9	84.8	89.4	93.7	97.9	101.9	105.7	109.4	113.0	116.5	119.9	123.2	126.4	
48	61.9	67.8	73.2	78.3	83.0	87.5	91.8	95.9	99.8	103.5	107.2	110.7	114.1	117.4	120.6	123.7	
49	60.6	66.4	71.7	76.7	81.3	85.7	89.9	93.9	97.7	101.4	105.0	108.4	111.8	115.0	118.1	121.2	

Table 5: Continued

50	59.4	65.1	70.3	75.1	79.7	84.0	88.1	92.0	95.8	99.4	102.9	106.3	109.5	112.7	115.8	118.8
51	58.2	63.8	68.9	73.7	78.1	82.4	86.4	90.2	93.9	97.4	100.9	104.2	107.4	110.5	113.5	116.5
52	57.1	62.6	67.6	72.2	76.6	80.8	84.7	88.5	92.1	95.6	98.9	102.2	105.3	108.4	111.3	114.2
53	56.0	61.4	66.3	70.9	75.2	79.2	83.1	86.8	90.4	93.8	97.1	100.2	103.3	106.3	109.2	112.1
54	55.0	60.2	65.1	69.6	73.8	77.8	81.6	85.2	88.7	92.0	95.3	98.4	101.4	104.3	107.2	110.0
55	54.0	59.2	63.9	68.3	72.4	76.4	80.1	83.7	87.1	90.4	93.5	96.6	99.6	102.5	105.3	108.0
56	53.0	58.1	62.7	67.1	71.2	75.0	78.7	82.2	85.5	88.7	91.9	94.9	97.8	100.6	103.4	106.1
57	52.1	57.1	61.6	65.9	69.9	73.7	77.3	80.7	84.0	87.2	90.2	93.2	96.1	98.9	101.6	104.2
58	51.2	56.1	60.6	64.8	68.7	72.4	75.9	79.3	82.6	85.7	88.7	91.6	94.4	97.2	99.8	102.4
59	50.3	55.1	59.6	63.7	67.5	71.2	74.7	78.0	81.2	84.2	87.2	90.0	92.8	95.5	98.1	100.7
60	49.5	54.2	58.6	62.6	66.4	70.0	73.4	76.7	79.8	82.8	85.7	88.5	91.3	93.9	96.5	99.0
61	48.7	53.3	57.6	61.6	65.3	68.9	72.2	75.4	78.5	81.5	84.3	87.1	89.8	92.4	94.9	97.4
62	47.9	52.5	56.7	60.6	64.3	67.7	71.0	74.2	77.2	80.2	83.0	85.7	88.3	90.9	93.4	95.8
63	47.1	51.6	55.8	59.6	63.2	66.7	69.9	73.0	76.0	78.9	81.6	84.3	86.9	89.4	91.9	94.3
64	46.4	50.8	54.9	58.7	62.3	65.6	68.8	71.9	74.8	77.6	80.4	83.0	85.6	88.0	90.5	92.8
65	45.7	50.1	54.1	57.8	61.3	64.6	67.8	70.8	73.7	76.5	79.1	81.7	84.2	86.7	89.1	91.4
66	45.0	49.3	53.2	56.9	60.4	63.6	66.7	69.7	72.6	75.3	77.9	80.5	83.0	85.4	87.7	90.0
67	44.3	48.6	52.4	56.1	59.5	62.7	65.7	68.7	71.5	74.2	76.8	79.3	81.7	84.1	86.4	88.7
68	43.7	47.8	51.7	55.2	58.6	61.8	64.8	67.7	70.4	73.1	75.6	78.1	80.5	82.9	85.1	87.3
69	43.0	47.1	50.9	54.4	57.7	60.9	63.8	66.7	69.4	72.0	74.5	77.0	79.4	81.7	83.9	86.1
70	42.4	46.5	50.2	53.7	56.9	60.0	62.9	65.7	68.4	71.0	73.5	75.9	78.2	80.5	82.7	84.9
71	41.8	45.8	49.5	52.9	56.1	59.2	62.0	64.8	67.4	70.0	72.4	74.8	77.1	79.4	81.5	83.7
72	41.2	45.2	48.8	52.2	55.3	58.3	61.2	63.9	66.5	69.0	71.4	73.8	76.1	78.3	80.4	82.5
73	40.7	44.6	48.1	51.5	54.6	57.5	60.3	63.0	65.6	68.1	70.5	72.8	75.0	77.2	79.3	81.4
74	40.1	44.0	47.5	50.8	53.8	56.8	59.5	62.2	64.7	67.2	69.5	71.8	74.0	76.1	78.2	80.3
75	39.6	43.4	46.9	50.1	53.1	56.0	58.7	61.3	63.8	66.3	68.6	70.8	73.0	75.1	77.2	79.2
76	39.1	42.8	46.2	49.4	52.4	55.3	58.0	60.5	63.0	65.4	67.7	69.9	72.1	74.1	76.2	78.2
77	38.6	42.3	45.6	48.8	51.7	54.5	57.2	59.8	62.2	64.5	66.8	69.0	71.1	73.2	75.2	77.1
78	38.1	41.7	45.1	48.2	51.1	53.8	56.5	59.0	61.4	63.7	65.9	68.1	70.2	72.2	74.2	76.1
79	37.6	41.2	44.5	47.6	50.4	53.2	55.8	58.2	60.6	62.9	65.1	67.2	69.3	71.3	73.3	75.2
80	37.1	40.7	43.9	47.0	49.8	52.5	55.1	57.5	59.9	62.1	64.3	66.4	68.5	70.4	72.4	74.2
81	36.7	40.2	43.4	46.4	49.2	51.9	54.4	56.8	59.1	61.4	63.5	65.6	67.6	69.6	71.5	73.3
82	36.2	39.7	42.9	45.8	48.6	51.2	53.7	56.1	58.4	60.6	62.7	64.8	66.8	68.7	70.6	72.4
83	35.8	39.2	42.3	45.3	48.0	50.6	53.1	55.4	57.7	59.9	62.0	64.0	66.0	67.9	69.8	71.6
84	35.4	38.7	41.8	44.7	47.4	50.0	52.4	54.8	57.0	59.2	61.2	63.2	65.2	67.1	68.9	70.7
85	34.9	38.3	41.3	44.2	46.9	49.4	51.8	54.1	56.3	58.5	60.5	62.5	64.4	66.3	68.1	69.9
86	34.5	37.8	40.9	43.7	46.3	48.8	51.2	53.5	55.7	57.8	59.8	61.8	63.7	65.5	67.3	69.1
87	34.1	37.4	40.4	43.2	45.8	48.3	50.6	52.9	55.0	57.1	59.1	61.1	62.9	64.8	66.5	68.3
88	33.7	37.0	39.9	42.7	45.3	47.7	50.1	52.3	54.4	56.5	58.5	60.4	62.2	64.0	65.8	67.5
89	33.4	36.6	39.5	42.2	44.8	47.2	49.5	51.7	53.8	55.8	57.8	59.7	61.5	63.3	65.0	66.7
90	33.0	36.1	39.0	41.7	44.3	46.7	48.9	51.1	53.2	55.2	57.2	59.0	60.8	62.6	64.3	66.0
91	32.6	35.8	38.6	41.3	43.8	46.2	48.4	50.6	52.6	54.6	56.5	58.4	60.2	61.9	63.6	65.3
92	32.3	35.4	38.2	40.8	43.3	45.7	47.9	50.0	52.1	54.0	55.9	57.7	59.5	61.2	62.9	64.6
93	31.9	35.0	37.8	40.4	42.8	45.2	47.4	49.5	51.5	53.4	55.3	57.1	58.9	60.6	62.3	63.9
94	31.6	34.6	37.4	40.0	42.4	44.7	46.9	48.9	50.9	52.9	54.7	56.5	58.3	59.9	61.6	63.2
95	31.3	34.2	37.0	39.5	41.9	44.2	46.4	48.4	50.4	52.3	54.1	55.9	57.6	59.3	60.9	62.5
96	30.9	33.9	36.6	39.1	41.5	43.8	45.9	47.9	49.9	51.8	53.6	55.3	57.0	58.7	60.3	61.9
97	30.6	33.5	36.2	38.7	41.1	43.3	45.4	47.4	49.4	51.2	53.0	54.8	56.5	58.1	59.7	61.2
98	30.3	33.2	35.9	38.3	40.7	42.9	44.9	46.9	48.9	50.7	52.5	54.2	55.9	57.5	59.1	60.6
99	30.0	32.9	35.5	37.9	40.2	42.4	44.5	46.5	48.4	50.2	52.0	53.7	55.3	56.9	58.5	60.0
100	29.7	32.5	35.1	37.6	39.8	42.0	44.0	46.0	47.9	49.7	51.4	53.1	54.8	56.3	57.9	59.4
101	29.4	32.2	34.8	37.2	39.5	41.6	43.6	45.6	47.4	49.2	50.9	52.6	54.2	55.8	57.3	58.8
102	29.1	31.9	34.5	36.8	39.1	41.2	43.2	45.1	46.9	48.7	50.4	52.1	53.7	55.2	56.8	58.2
103	28.8	31.6	34.1	36.5	38.7	40.8	42.8	44.7	46.5	48.2	49.9	51.6	53.2	54.7	56.2	57.7

Table 5: Continued

104	28.6	31.3	33.8	36.1	38.3	40.4	42.4	44.2	46.0	47.8	49.5	51.1	52.7	54.2	55.7	57.1
105	28.3	31.0	33.5	35.8	37.9	40.0	42.0	43.8	45.6	47.3	49.0	50.6	52.2	53.7	55.1	56.6
106	28.0	30.7	33.2	35.4	37.6	39.6	41.6	43.4	45.2	46.9	48.5	50.1	51.7	53.2	54.6	56.0
107	27.8	30.4	32.8	35.1	37.2	39.3	41.2	43.0	44.8	46.4	48.1	49.7	51.2	52.7	54.1	55.5
108	27.5	30.1	32.5	34.8	36.9	38.9	40.8	42.6	44.3	46.0	47.6	49.2	50.7	52.2	53.6	55.0
109	27.2	29.8	32.2	34.5	36.6	38.5	40.4	42.2	43.9	45.6	47.2	48.7	50.2	51.7	53.1	54.5
110	27.0	29.6	31.9	34.2	36.2	38.2	40.0	41.8	43.5	45.2	46.8	48.3	49.8	51.2	52.6	54.0
111	26.8	29.3	31.7	33.8	35.9	37.8	39.7	41.4	43.1	44.8	46.3	47.9	49.3	50.8	52.2	53.5
112	26.5	29.0	31.4	33.5	35.6	37.5	39.3	41.1	42.8	44.4	45.9	47.4	48.9	50.3	51.7	53.0
113	26.3	28.8	31.1	33.2	35.3	37.2	39.0	40.7	42.4	44.0	45.5	47.0	48.5	49.9	51.2	52.6
114	26.1	28.5	30.8	33.0	35.0	36.8	38.6	40.4	42.0	43.6	45.1	46.6	48.0	49.4	50.8	52.1
115	25.8	28.3	30.6	32.7	34.6	36.5	38.3	40.0	41.6	43.2	44.7	46.2	47.6	49.0	50.3	51.6
116	25.6	28.0	30.3	32.4	34.3	36.2	38.0	39.7	41.3	42.8	44.3	45.8	47.2	48.6	49.9	51.2
117	25.4	27.8	30.0	32.1	34.1	35.9	37.6	39.3	40.9	42.5	44.0	45.4	46.8	48.2	49.5	50.8
118	25.2	27.6	29.8	31.8	33.8	35.6	37.3	39.0	40.6	42.1	43.6	45.0	46.4	47.8	49.1	50.3
119	25.0	27.3	29.5	31.6	33.5	35.3	37.0	38.7	40.2	41.8	43.2	44.6	46.0	47.4	48.6	49.9
120	24.7	27.1	29.3	31.3	33.2	35.0	36.7	38.3	39.9	41.4	42.9	44.3	45.6	47.0	48.2	49.5
121	24.5	26.9	29.0	31.0	32.9	34.7	36.4	38.0	39.6	41.1	42.5	43.9	45.3	46.6	47.8	49.1
122	24.3	26.7	28.8	30.8	32.7	34.4	36.1	37.7	39.3	40.7	42.2	43.5	44.9	46.2	47.5	48.7
123	24.1	26.4	28.6	30.5	32.4	34.1	35.8	37.4	38.9	40.4	41.8	43.2	44.5	45.8	47.1	48.3
124	24.0	26.2	28.3	30.3	32.1	33.9	35.5	37.1	38.6	40.1	41.5	42.8	44.2	45.4	46.7	47.9
125	23.8	26.0	28.1	30.1	31.9	33.6	35.2	36.8	38.3	39.8	41.2	42.5	43.8	45.1	46.3	47.5
126	23.6	25.8	27.9	29.8	31.6	33.3	35.0	36.5	38.0	39.4	40.8	42.2	43.5	44.7	45.9	47.1
127	23.4	25.6	27.7	29.6	31.4	33.1	34.7	36.2	37.7	39.1	40.5	41.8	43.1	44.4	45.6	46.8
128	23.2	25.4	27.5	29.3	31.1	32.8	34.4	35.9	37.4	38.8	40.2	41.5	42.8	44.0	45.2	46.4
129	23.0	25.2	27.2	29.1	30.9	32.6	34.1	35.7	37.1	38.5	39.9	41.2	42.5	43.7	44.9	46.0
130	22.8	25.0	27.0	28.9	30.6	32.3	33.9	35.4	36.8	38.2	39.6	40.9	42.1	43.3	44.5	45.7

**The Standardized Table of the Relative Anaerobic Muscular Power for Wrestlers:** The researcher has made the standardized table to calculate the relative anaerobic power for wrestlers according to the result of throwing medicine ball backwards test in the terms of both weight and distance.

**A Model to Calculate the Relative Anaerobic Power and How to Disclose it from the Standardized Table:** Player weighs 74kg has thrown medicine ball (3kg) backwards to 18 meters distance. Calculate the relative anaerobic power for this player.

First:

$$\begin{aligned} \text{Power} &= \text{force} \times \text{velocity} & P &= F \times V \\ \text{Velocity} &= \frac{\text{weight of ball}}{\sqrt{2 \times 9.81 \times \text{distance}}} & F &= W_{\text{ball}} \\ \text{velocity} &= \frac{3}{\sqrt{2 \times 9.81 \times 18}} & V &= \frac{3}{\sqrt{2 \times 9.81 \times 18}} \end{aligned}$$

Then compensate in 2<sup>nd</sup> equation (equation "2")

$$\text{Power Ratio} = (P/W_{\text{player}}) \times 100$$

**Second:** Anaerobic power can be calculated from the standardized model (Table 4) directly and this is by knowing the player's weight and distance of the thrown medicine ball. Thus the relative anaerobic power is the value resulted from the intersection of player's weight with the thrown ball distance, in the sense that anaerobic power for player is 76.1 kgm/sec.

## CONCLUSION

- The throwing medicine ball (3kg) backwards test to measure the general anaerobic power for wrestlers in the study has achieved a high test validity that ranges between 0.84- 0.81 with the vertical jump test and 50 yards sprint as a criterion.
- The test has a high discriminatory ability.
- The throwing medicine ball (3kg) backwards test to measure the general anaerobic power for wrestlers in the study (research) has achieved a high reliability coefficient of 0.87.
- Standard score of the relative anaerobic power can be extracted from the standard degrees tables in the terms of weight and distance.

**Recommendations:**

- Using the throwing medicine ball (3kg) backwards test to measure the anaerobic power for wrestlers.
- Be interested in measuring and evaluating the anaerobic power as it is considered an important part contributing to sporting achievements.
- Standardized tables can be used to get the relative anaerobic power in the terms weight and distance of thrown ball.
- The relative anaerobic power can be used to select juniors and evaluating training method.

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