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Construction and Standardization of test for Strength and Endurance in Cricket

Sajjan Kaushik (Ph.D Research Scholar)

Department of Physical Education, Shri Khushal Das University, Hanumangarh (Rajasthan)

Technology has encompassed every aspect of human life, sports nowadays have become highly scientific. As a result, new records are being created shattering the old ones at the higher rate. Every country seeks to beguile its superiority. This challenge stimulates and inspires all human to sweat and strive to run faster, jump higher and to throw farther than others, and show greater strength, speed, endurance and skill to lead and dominate to over others. Nineteenth century was an extra ordinary period of development in tenures of both ideas about sport and fitness. Muscular activity and competition became not only acceptable but favorable. Moral development began to be tied to sports and fitness.

Physical fitness plays an important role in any Cricketer's success. In the present day cricketing world, there are no short cuts to success except hard work and constant physical fitness. If one is talented and physically fit, then the sky is the limit for such a player. Today's players are much fitter and more energetic than players two decades ago. Physical training for players is a must today as the game has become highly competitive. In fact, many talented players could not make it to top level Cricket mainly due to lack of physical fitness. (Amarnath, 1996) Physical fitness is an essential element of any successful Cricketer's overall characteristics. Such fitness leads to a positive frame of mind.

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For instance, the legendary Australian pace man Dennis Lillee could make a comeback after suffering a serious back injury because of intense and disciplined physical exercises, which ensured his fitness. Similarly, in 1983, lmran khan, was seriously injured on his shin, which could have finished his career. But sheer determination and regular training helped them in overcoming all obstacles in his way.

Methodology : The present study was conducted to construct strength and endurance test for cricket and construct norms to find out the intensity of physical fitness of cricket players. One hundred twenty male cricket players with age group 18 to 25 years from north zone inter university teams of Haryana were the subjects for the study. They were selected on the basis of random sampling. strength and endurance of players were measured with Shot-Put, Two hand Medicine Ball Put, Two hand Basket Ball Throw , Two hand Medicine Ball roll,800 Meter Run Test,2.4 Kilo meter Run test,8 Minute Run Test, 600 Meter Run Test.. The reliability coefficient was be calculated by test-re-test method. The validity coefficient of those test items was calculated with the help of validation equation the most reliable and valid test was be included as a simple test items for that particular strength and endurance variable .A test was constructed after selecting one most reliable and valid test for each strength and endurance variable . The norms were decided with the help of percentile, sigma scale, hull scale, T scale and factorial analysis.

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RESULTS AND DISCUSSION

TABLE NO. 1

MEANS, STANDARD DEVIATIONS, MINIMUM & MAXIMUM OF STRENGTH AND ENDURANCE COMPONENTS OF CRICKET PLAYERS

Components	Minimum	Maximum	Mean	SD
Shot put	3.42	8.12	6.12	.93
2 hand Medicine Ball put	3.08	7.92	4.76	.78
2 hand basket ball throw	8.12			
2 hand medicine ball roll	9.02	15.00	11.28	1.24
800 meter run	127	22.82	16.72	2.97
2.4 K.M. run	768	176.80	144.12	8.78
8 minute run	1246			
600 meter run	70.82	1026.40	930.80	46.72
		2076	1764	192.70
		129.00	92.90	11.84

EXPRESS DESCRIPTIVE ANALYSIS OF STRENGTH AND ENDURANCE OF CRICKET PLAYERS MEAN AND S.D OF STRENGTH

In case of Arm Strength variables, shot-put, mean and S.D. are 6.12 and 0.93. Two hand medicine Ball put means and S.D. are 4.78 and 0.78, two hand Basket Ball throw mean and S.D. are 11.28 and 1.24 and two hand medicine ball roll 16.73 and 2.98.

Mean and S.D for ENDURANCE

IN CASE OF ENDURANCE VARIABLE 800 METER RUN MEAN AND S.D. ARE 144.12 AND 8.78, 2.4 KILOMETER RUN MEAN AND S.D. ARE 930.80 AND 46.72, 8 MINUTES RUN TEST MEAN AND S.D. ARE 1764 AND 192.70 AND 600 METER RUN TEST MEAN AND S.D. 92.90 AND 11.84.

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TABLE- 2

FACTOR -1- ENDURANCE

S. NO.	TEST VARIABLE	LOADING
1.	2.4 Run Test	.844
2.	2.4 Run test	.220
3.	8 min run test	-.335
4.	800 min run test	-.033

The test namely 2.4 Run test (.844) and 600 meter .335 have higher loading with Endurance. All the other test came out low loading .

TABLE - 3

FACTOR –2 STRENGTH

S. NO.	VARIABLES	LOADING
1.	Two hand medicine Ball Roll	.690
2.	Shot put	.618
3.	Two hand medicine Ball put	.186
4.	Two hand Basketball throw	-.042

Two hand Medicine ball roll have the highest loading of .690, shot-put (.618) also have the highest loading and other test variables came out low loading .

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TABLE- 4
FACTOR-3 STRENGTH

S. NO.	TEST VARIABLES	LOADING
1.	Two hand Medicine ball put	.732
2.	Two hand Basketball throw	.176
3.	Shot-put	.068
4.	Two hand Medicine ball roll	.038

Test namely two hand medicine ball put have a highest loading with (.732) and other variables of physical fitness test battery came out low loading with factor 3.

COMPARISON VALIDITY

Comparison validity was established by the comparison of specific physical fitness test battery between successful and unsuccessful players. Successful players were the players who were selected to the university and unsuccessful players were selected randomly from the players who participated in district and inter college tournaments. The 't' value between successful and unsuccessful cricket players is presented in table no.

TABLE NO -5
COMPARISON BETWEEN SUCCESSFUL AND UNSUCCESSFUL CRICKET PLAYERS ON COMPONENT ENDURANCE (2.4 KILOMETER RUN TEST)

VARIABLE	GROUPS	N	MEAN	S.D.	SE.D.	't'	LEVEL OF SIGNIFICANCE
2.4 K.M RUN TEST	SUCCESSFUL CRICKETPLAYERS	15	986.53	120.20	38.51	2.11	*SIGNIFICANT
	UNSUCCESSFUL CRICKETPLAYERS	15	905.08	88.31			

* Significant at 0.05 level

It is relevant from the table 5 that the 2.4 kilometer run test between successful cricket players and unsuccessful cricket players found to have mean score of 986.53 and 905.08 respectively. The 't' ratio between the mean score of these two different groups

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came out to be 2.11, which is significant at 0.05 level. It indicates that there is significant difference on 2.4 kilometer run test among successful and unsuccessful cricket players.

TABLE NO -6
COMPARISON BETWEEN SUCCESSFUL AND UNSUCCESSFUL CRICKET PLAYERS ON COMPONENTS STRENGTH (TWO HAND MEDICINE ROLL)

VARIABLE	GROUPS	N	MEAN	S.D.	SE.D.	't'	LEVEL OF SIGNIFICANCE
TWO HAND MEDICINE BALL ROLL	SUCCESSFUL CRICKETPLAYERS	15	17.98	4.48	1.74	2.28	*SIGNIFICANT
	UNSUCCESSFUL CRICKETPLAYERS	15	14.01	5.10			

* Significant at 0.05 level

It is impales from the table -6 that the two hand medicine roll between successful cricket players and unsuccessful cricket players found to have mean score of 17.98 and 14.01 respectively. The 't' ratio between the mean score of these two different groups came out to be 2.28, which is significant at 0.05 level. It indicates that there is significant difference on two hand medicine roll variable among successful and unsuccessful cricket players.

TABLE NO -7
COMPARISON BETWEEN SUCCESSFUL AND UNSUCCESSFUL CRICKET PLAYERS ON COMPONENTS STRENGTH (TWO HAND MEDICINE PUT)

VARIABLE	GROUPS	N	MEAN	S.D.	SE.D.	't'	LEVEL OF SIGNIFICANCE
TWO HAND MEDICINE PUT	SUCCESSFUL CRICKET PLAYERS	15	5.96	2.12	0.76	2.63	*SIGNIFICANT
	UNSUCCESSFUL CRICKET PLAYERS	15	4.11	2.14			

* Significant at 0.05 level

It is evident from the table no -7 that the two hand medicine put between successful cricket players and unsuccessful cricket players found to have mean score of 5.96 and 4.11 respectively. The 't' ratio between the mean score of these two different

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groups came out to be 2.63, which is significant at 0.05 level. It indicates that there is significant difference on two hand medicine put variable among successful and unsuccessful cricket players.

TABLE NO -8

NORMS FOR TWO HAND MEDICINE BALL PUT

PERCENTILE	SIGMA SCALE	HULL – SCALE	T-SCALE	RAW SCORE
100	119.17	109.27	91.48	7.96
95	111.54	102.75	86.94	7.57
90	67.89	65.33	60.74	5.58
85	63.81	61.84	58.29	5.40
80	63.37	61.46	58.03	5.38
75	60.69	59.16	56.41	5.25
70	58.48	57.27	55.09	5.15
65	58.33	57.14	55.00	5.15
60	57.23	56.20	54.34	5.10
55	52.85	52.44	51.71	4.90
50	52.85	52.44	51.71	4.90
45	50.66	50.56	50.39	4.80
40	46.27	46.81	47.76	4.60
35	44.26	45.26	46.68	4.51
30	40.79	42.11	44.47	4.35
25	37.78	39.52	42.66	4.21
20	35.53	37.60	41.32	4.11
15	30.93	33.65	38.55	3.90
10	28.74	31.77	37.24	3.80
5	23.54	27.32	34.12	3.56

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NORMS FOR TWO HAND MEDCINE BALL PUT

In table no -8 Norms of various scale has been presented for the measurement and evaluation of two hand medicine ball put . The raw score ranged from 3.56 to 7.96. The highest score on sigma scale, hull-scale and T-scale were 119.17, 109.27, 91.48, were as 23.54, 27.2, 34.12 were the lowest score on sigma scale, hull-scale, T-scale.

TABLE NO -9

NORMS OF TWO HAND MEDICINE BALL ROLL

PERCENTILE	SIGMA SCALE	HULL - SCALE	T-SCALE	RAW SCORE
100	84.12	79.28	70.46	22.80
95	82.22	77.62	69.34	22.46
90	70.84	67.87	62.51	20.44
85	69.52	66.73	61.72	20.20
80	65.43	63.22	59.26	19.47
75	63.35	61.44	58.01	19.10
70	60.13	58.68	56.08	18.53
65	58.86	57.60	55.32	18.30
60	56.60	55.65	53.96	17.90
55	52.85	52.44	51.71	17.23
50	50.73	50.63	50.44	16.85
45	47.64	47.98	48.59	16.30
40	45.89	46.48	47.54	15.99
35	43.72	44.61	46.23	15.60
30	41.45	42.67	44.87	15.20
25	39.09	40.65	43.45	14.78
20	34.97	37.11	40.98	14.04
15	29.50	32.43	37.69	13.07
10	26.19	29.59	35.71	12.48
5	20.22	24.46	32.13	11.41

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NORMS FOR TWO HAND MEDCINE BALL ROLL

It is evident from table no -9 Norms of various scale has been presented for the measurement and evaluation of two hand medicine ball roll. The raw score ranged from 11.41 to 22.80. The highest score on sigma scale, hull-scale and T-scale were 84.12, 79.28, 70.46 were as 20.22, 24.46, 32.13 were the lowest score on sigma scale, hull-scale, T-scale respectively.

TABLE NO -10
NORMS FOR 2.4 KM RUN TEST

PERCENTILE	SIGMA-SCALE	HULL-SCALE	T-SCALE	RAW SCORES
100	88.11	82.67	72.88	1025.40
95	87.56	82.20	72.55	1023.88
90	72.85	69.58	63.71	983.52
85	69.31	66.55	61.59	973.80
80	64.28	62.24	58.57	960.00
75	62.69	60.88	57.62	955.65
70	58.81	57.55	55.29	945.00
65	56.47	55.55	53.88	938.58
60	52.21	51.89	51.32	926.88
55	49.37	49.46	49.62	919.11
50	47.88	48.18	48.72	915.00
45	45.69	46.30	47.41	909.00
40	44.59	45.37	46.76	906.00
35	44.70	43.75	45.62	900.81
30	40.48	41.84	44.29	894.72
25	40.22	41.62	44.13	894.00
20	38.03	39.74	42.82	888.00
15	36.28	38.24	41.77	883.20
10	33.07	35.49	39.84	874.38
5	26.01	29.44	35.60	855.01

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NORMS FOR 2.4 KM RUN TEST

In table -10 Norms of various scale has been presented for the measurement and evaluation of 2.4 Kilo meter run test. The raw score ranged from 855.01 to 1025.40. The highest score on sigma scale 88.11, hull-scale 82.67 and T-scale were 72.88 where as 26.01, 29.44, 35.60 were the lowest score on sigma scale, hull-scale, T-scale respectively.

DISCUSSION OF FINDINGS

The factor analysis technique has been significantly established their crucial roll and relationship to performance of cricket players. The details of all the factors are presented as follows.

FACTOR -1

The factor one of rotated factor analysis shows that only 2.4 kilo meter run test came out significant variables in factor 1 as their loadings IS .844 were higher than the 0.512. and the name of the factor was given as ***"Endurance".***

FACTOR 2

The factor 2 of rotated factor analysis shows that among fitness test items i.e, shot put and two hand medicine ball roll test came out significant as variables in factor 2 as their loadings are .618 and .690 respectively, were higher than the 0.512. But only the ***"two hand medicine ball roll test"*** was selected for including in the fitness test battery, because this item was the highest loading item than other items, which were included in factor 2 and the name of the factor was given as ***"Strength".***

FACTOR 3

The factor 3 of rotated factor analysis shows that among test items i.e., two hand medicine ball put test came out significant in fitness test variables in factor 2 as the loadings is .732 were higher than the 0.512. ***"Two hand medicine ball put"*** was selected for including in the test battery, because this item was the highest loading item than other items, which were included in factor 2 and the name of the factor was given as ***"Strength".***

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It may be also observed that the reliability co-efficient obtained from different test items of the specific physical fitness test battery for cricket players were ranged from 0.76 too0.89.

For obtaining validity of the test battery, factor analysis technique was used for the extraction of factor and thus the construct validity of the present test battery was established. As stated earlier that the factor analysis is particularly useful tool for examining the validity of the test.

There for, the earlier mentioned specific strength and endurance test battery for cricket and developed by the investigator could be considered, reliable, objective and valid. Norms have also been prepared for cricket players on different test items of specific fitness test. Thus the test meets and criteria on of scientific authenticity.

CONCLUSIONS

On the basic of the discussion of the tests, the following conclusions were made.

1. All the test items identified 2.4 kilo meter run, two hand medicine ball put, two hand medicine ball roll .
2. A significant difference in the mean was found to exist between the test variables when applied to the success and unsuccessful players. This proved beyond any doubt that the test items are highly significant in measuring the fitness of cricket players.
3. Norms for the specifics strength and endurance test have been developed on Inter university players of Haryana state.

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