



Construction of Physical Fitness Test Norms for Under 16 Cricketers in Central Zone

Yuvraj Singh Dasondhi

Strength & Conditioning Coach, Vidarbha Cricket Association Academy, VCA Stadium, Civil Lines, Nagpur, Maharashtra, India.

Dr. Ajay Karkare

Principal, Rani Laxmibai Mahila Mahavidyalaya, Sawargaon, Nagpur, Maharashtra, India.

ABSTRACT

The aim of the study was to construction of physical fitness test norms for under16 cricketers in Central Zone (Vidarbha Cricket Association, Rajasthan Cricket Association, Madhya Pradesh Cricket Association, Chhattisgarh State Cricket Sangh and Uttar Pradesh Cricket Association) between 15-16 years of age were randomly selected. The performance of under 16 male cricket players in physical fitness test of deferent variables of cricket were chosen as the criterion measures. The pre test only random group design was used for analysis of the data. Means and Standard Deviation were calculated for all subjects and deferent fitness test. Statistically Percentile Scale have been classified into five intervals Excellent (above 80%), Very Good (79% - 60%), Good (59% - 40%), Average (39% - 20%) and Below Average (below 20%) then Z-Scores Scale have been classified into five grades i.e. Excellent, Very Good, Good, Average and Below Average constructed for the both statically tests.

KEYWORDS

Central Zone, Fitness Norms, Junior Cricket Players

INTRODUCTION

The present study was undertaken to construction of physical fitness test norms for under 16 cricketers in Central Zone (VCA, RCA, MPCA, CSCS and UPCA) serves this purpose in a meaningful way. Anaerobic capacity, muscular strength, muscular endurance, power, speed, agility, core stability and anthropometric measure as dependent variables and various test performances as independent variables. The goal of this research was to provide a better vision to the experts in field of cricket. This research will be also provide beneficial information for cricketers and strength and conditioning coaches, as it will detail physical fitness test norms that should be made specifically for central zone cricketers.

METHODS: Subjects; one seventy three (n = 173) junior level under 16 male cricket players of Central Zone were randomly selected. The methodology and procedure used in this study were approved by NCA (National Cricket Academy). All subjects received a clear explanation of the study, including the risk and benefits of participation were obtained prior to testing. **Criterion Measures;** the performance of junior level under 16 male cricketers players in physical fitness test of deferent variables of cricket namely, Anthropometric Test (height, weight & seven sites of skinfold), Power Test (vertical jump), Speed Test (20m & 40m Sprint), Agility Test (run a three), Anaerobic Capacity (sprint repeat), Strength Test (squats, pushups & chin ups) & Core Stability, Balance, & Static Strength (prone hold) were chosen as the criterion measures. The pre test only random group design was used for analysis of the data. **Testing Procedure;** three days, six sessions were used for players of each cricket association for testing during summer coaching camps or off session camps of various cricket associations of central zone. All the cricket related physical fitness test was administer on different cricket field, indoors & gym, prior to data tasting, all players completed a standardized warm-up. This consisted of five minutes of jogging followed by five minutes of dynamic stretching of the full body and specific warm up before deferent fitness test. **Statistical Analyses;** means and standard deviation were calculated for all subjects and deferent fitness test. Statistically Percentile scale have been classified into five intervals Excellent (above 80%), Very Good (79% - 60%), Good (59% - 40%), Average (39% - 20%) and Below Average (below 20%) then Z-Scores scale have been

classified into five grades i.e. Excellent, Very Good, Good, Average and Below Average constructed for the both statically tests. All statistical analyses were processed using the Statistical Package for Social Sciences (SPSS) version 20.0 for Windows and Microsoft Excel 2013.

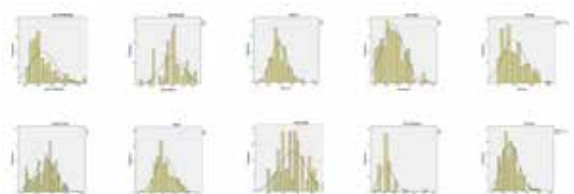
RESULTS: Mean and standard deviations of the study test items are presented in **Table 1**.

Table 1: Mean and Standard Deviation of test items of under 16 junior male of central zone

Test Items	Sumof-Skin Fold	Sprint Repeat	Chin Up	Push Up	Squats	Vertical Jump	RunA Three	20mt Sprint	40mt Sprint	Prone Hold
Mean	58.15	700.14	4.55	15.34	42.65	35.84	10.90	3.50	6.28	1.26
SD	22.86	27.28	3.35	7.24	14.67	6.88	0.68	0.27	0.46	0.72

Means and Standard Deviation of different age group have been shown in above table 1 and different graph shown represent test variables mean and standard deviation below from figure 1 represent under 16 junior level male cricket players in central zone in India.

Figure No.1: Mean and SD of all tests of under 16 male cricket player of central zone



Percentile Scale; the percentile scale for under 16 junior male cricket players of central zone as employed in this study. Percentile Scale of physical fitness test has been presented in the **Table 2**.

Table 2: Percentile Scale of the under 16 junior male cricket players of central zone

Per-centile Score	Sum of Skin-fold	Sprint Re-peat	Chin Ups	Push Ups	Squats	Verti-cal Jump	Run A Three	20m Dash	40m Dash	Prone Hold
100	31	755	15	40	81	50	8.87	2.69	4.90	5.02
90	36	735	9	25	65	44	9.52	2.99	5.42	2
80	40	725	8	21	55	42	9.87	3.08	5.58	1.48
70	44	710	6	18	48	39	10.37	3.28	5.84	1.42
60	47	705	5	17	44	38	10.52	3.34	6.01	1.28
50	51	700	4	15	39	37	10.86	3.49	6.27	1.22
40	55	700	3	12	36	35	11.26	3.62	6.51	1.15
30	63	690	2	11	34	32	11.40	3.71	6.68	1.05
20	74	685	1	9	30	30	12.00	3.95	7.03	0.56
10	90	655	1	6	26	25	12.46	4.08	7.34	0.49
0	139	625	0	2	7	22	13.78	4.32	7.68	0.28

Table 2 shows that cricket related different variable physical fitness test result of under 16 junior male cricket players of central zone says, in the Skinfold Test highest performance scores were 31mm and lowest performance score were 139mm, in the Sprint Repeat Test highest performance scores were 755mt and lowest performance score were 625mt, in the Chin Up Test highest performance scores were 15 and lowest performance score were 0, in the Push Up Test highest performance scores were 40 and lowest performance score were 2, in the Squats Test highest performance scores were 81 and lowest performance score were 7, in the Vertical Jump Test highest performance scores were 50cm and lowest performance score were 22cm, in the Run A Three Test highest performance scores were 8.87sec and lowest performance score were 13.78 sec, in the 20M Dash Test highest performance scores were 2.69 sec and lowest performance score were 4.32 sec, in the 40M Dash Test highest performance scores were 4.90 sec and lowest performance score were 7.78 sec., at last for the Prone Hold Test highest performance scores were 5.02 min and lowest performance score were 0.28 min respectively.

Percentile grading scale of physical fitness test has been presented in the **Table 3**.

Table 3: Percentile Grading Scale for under 16 male cricket player of central zone under normal distribution

Percentile Grade Scale	Excellent	Very Good	Good	Average	Below Average
	above 80%	79% - 60%	59% - 40%	39% - 20%	below 20%
Skin Fold (mm)	below 40	40 - 47	48 - 55	55 - 74	above 74
Sprint Repeat (mt)	above 725	720 - 705	700	695 - 685	below 685
Chin Up (no)	above 08	08 - 06	05 - 03	02 - 01	below 01
Push Up (no)	above 21	21 - 17	16 - 12	11 - 09	below 09
Squats (no)	above 55	55 - 44	43 - 36	35 - 30	below 30
Vertical Jump (cm)	above 42	42 - 38	37 - 35	34 - 30	below 30
Run A Three (mt)	below 9.87	9.87 - 10.52	10.53 - 11.26	11.27 - 12	above 12
20m Dash (mt)	below 3.08	3.08 - 3.34	3.35 - 3.62	3.63 - 3.95	above 3.95
40m Dash (mt)	below 5.58	5.58 - 6.01	6.02 - 6.51	6.52 - 7.03	above 7.03
Prone Hold (sec)	above 89	89 - 77	76 - 69	68 - 34	below 34

Table 3 shows that the performance of all test of under 16 male cricket players of central zone has been divided into five categories namely, excellent (above 80%), very good (79% - 60%), good (59% - 40%), average (39% - 20%) and below average (below 20%). In all test performance under five categories starting from excellent (above 80%), very good (79%

- 60%), good (59% - 40%), average (39% - 20%) and below average (below 20%) were below result of Skin Fold Test results were below 40mm, 40mm to 47mm, 48mm to 55mm, 56mm to 74mm and above 74mm respectively. In Sprint Repeat Test result were above 725mt, 720mt to 705mt, 700mt, 695mt to 685mt and below 685mt respectively. In Chin Up Test result were above 08, 08 to 06, 05 to 03, 02 to 01 and below 01 respectively. In Push Up Test result were above 21, 21 to 17, 16 to 12, 11 to 09 and below 09 respectively. In Squat Test result were above 55, 55 to 44, 43 to 36, 35 to 30 and below 30 respectively. In Vertical Jump Test result were above 42cm, 42cm to 38cm, 37cm to 35cm, 34cm to 30cm and below 30cm respectively. In Run a Three Test result were below 9.87sec, 9.87sec to 10.52sec, 10.53sec to 11.26sec, 11.27sec to 12sec and above 12sec respectively. In 20m Dash Test result were below 3.08sec, 3.08sec to 3.34sec, 3.35sec to 3.62sec, 3.63sec to 3.95sec and above 3.95sec respectively. In 40m Dash Test result were below 5.58sec, 5.58sec to 6.01sec, 6.02sec to 6.51sec, 6.52sec to 7.03sec and above 7.03sec respectively. In Prone Hold Test result were above 89sec, 89sec to 77sec, 76sec to 69sec, 68sec to 34sec and below 34sec respectively.

The Z-Score and grading scale for under 16 junior male cricket players of central zone as employed under normal distribution in this study. Z-Score and grading scale of physical fitness test has been presented in the **Table 4**.

Table 4: Z-Score Scale grading for under 16 male cricket player of central zone under normal distribution

Z-Score Scale	Excellent	Very Good	Good	Average	Below Average
Skin Fold (mm)	below 17	17 - 44.43	44.43 - 71.86	71.86 - 99.29	above 99.29
Sprint Repeat (mt)	above 750	750 - 715	715 - 680	680 - 645	below 645
Chin Up (no)	above 11	11 - 08	07 - 04	03 - 00	below 00
Push Up (no)	above 28	28 - 20	19 - 11	10 - 02	below 02
Squats (no)	above 69	69 - 52	51 - 34	33 - 16	below 16
Vertical Jump (cm)	above 48	48 - 41	40 - 32	31 - 23	below 23
Run A Three (mt)	below 9.68	9.68 - 10.50	10.50 - 11.31	11.31 - 12.12	above 12.12
20m Dash (mt)	below 3.01	3.01 - 3.34	3.34 - 3.67	3.67 - 3.99	above 3.99
40m Dash (mt)	below 5.54	5.54 - 6.00	6.00 - 6.56	6.56 - 7.11	above 7.11
Prone Hold (sec)	above 154	154 - 102	102 - 50	50 - 30	below 30

Table 4 shows that the performance has been divided into five categories under normal distribution namely, excellent, very good, good, average and below average. In Skinfold Test the performance under five categories were below 17mm, 17mm to 44.43mm, 44.43mm to 71.86mm, 71.86mm to 99.29mm and above 99.29mm respectively. In Sprint Repeat Test the performance under five categories were above 750mt, 750mt to 715mt, 715mt to 680mt, 680mt to 645mt and below 645mt respectively. In Chin Up Test the performance under five categories starting were above 11, 11 to 08, 07 to 04, 03 to 00 and below 00 respectively. In Push Up Test the performance under five categories were above 28, 28 to 20, 19 to 11, 10 to 02 and below 02 respectively. In Squat Test the performance under five categories starting were above 69, 69 to 52, 51 to 34, 33 to 16 and below 16 respectively. In Vertical Jump Test the performance under five categories were above 48cm, 48cm to 41cm, 40cm to 32cm, 31cm to 23cm and below 23cm respectively. In Run a Three Test the performance under five categories starting were below 9.68sec, 9.68sec to 10.50sec, 10.50sec to 11.31sec, 11.31sec to 12.12sec and above 12.12sec respectively. In 20m Dash Test the performance under five categories starting were below 3.01sec, 3.01sec to 3.34sec, 3.34sec to 3.67sec, 3.67sec to 3.99sec and above 3.99sec respectively. In 40m

Dash Test the performance under five categories starting were below 5.45sec, 5.45sec to 6.00sec, 6.00sec to 6.56sec, 6.56sec to 7.11sec and above 7.11sec respectively. In Prone Hold Test the performance under five categories starting were above 154sec, 154sec to 102sec, 102sec to 50sec, 50sec to 30sec and below 30sec respectively.

DISCUSSION

This is one of the first studies to investigate physical fitness test norms specific for under 16 junior male cricketers of central zone. Furthermore, this is the first study to giving two grading scale under normal distribution (percentile & Z-score scale). Percentile Scales for all physical fitness test variables of under 16 junior male cricket players were constructed. Percentile Scale seems to be appropriate because the highest performance in physical fitness test receives the maximum scores whereas the lowest performance in the test items receives a score of 0. This type of scale is only suitable for the sample selected as in future an excellent player may exhibit better performance than the maximum performance of the scale in comparison to the given sample. In that case, still the performance will be given the maximum score. This seems to be lacuna in the percentile scale as this is only suitable for the given group and it does not take into consideration any performance i.e. either good or bad in future. Further, the other drawback noted in the percentile scale was that the similar performance credits different score which seems inappropriate.

Keeping the drawbacks of percentile scale in mind, it was thought appropriate to construct Z-Score scale. This scale is appropriate for all the test items as a specific performance got a specific score. However, it was noted that was a slight difficulty in giving at extreme ends of the scale because for a lowest performance in different variable scores could be credited. This happened because of the individual differences in body type, history of training, history of injury or illness and recovery pattern of the test as any performance cannot be change score in permissible outcomes of skin fold, prone hold and chin up test.

Keeping the drawback of percentile and Z-score scale in mind, it was thought appropriate to categories players into five grades/categories i.e. excellent, very good, good, average and below average. The result revealed that performance can be easily divided into five grades/categories without encountering any difficulty. Hence, grading under normal distribution proved to be the most suitable way of categorizing players as the drawback of the percentile and Z-score scale were eliminated. Keeping in educational reform in mind, there is a trend to award grades rather than the score in order to reduce stress and anxiety among the players. Thus, grading under normal distribution yielded a suitable scale.

REFERENCES

- Ajmer Singh (1986) "Normalative study of the Physical Fitness of Panjab University Men Student", Unpublished Doctoral Thesis, Panjab University, Chandigarh. Bourdon, P; Savage & B; Done, R. (2000) "Protocols for the Assessment of Cricket Players". Physiological Tests for Elite Athletes. Australian Sports Commission. HYPERLINK "http://www.ncbi.nlm.nih.gov/pubmed?term=Bishop%20D%5BAuthor%5D&cauthor=true&cauthor_uid=11339490" Bishop D et.al (2011). "Repeated-sprint ability - part II: recommendations for training" HYPERLINK "<http://www.ncbi.nlm.nih.gov/pubmed/21846163>" \o "Sports medicine (Auckland, N.Z.)." Sports Med., pp.741-56. Devandr K. Kansal (2008) "Applied Measurement, Evaluation and Sports Selection" IInd edition, New Delhi, Sports & Spiritual Science Publication, pp.4. Hardayal Singh (1997) "Sports Training: General Theory and Medicine", New Delhi, D.A.V. Publication, pp. 211. HYPERLINK "http://www.ncbi.nlm.nih.gov/pubmed?term=Lockie%20RG%5BAuthor%5D&cauthor=true&cauthor_uid=23439342" Lockie RG & HYPERLINK "http://www.ncbi.nlm.nih.gov/pubmed?term=Callaghan%20SJ%5BAuthor%5D&cauthor=true&cauthor_uid=23439342" Callaghan SJ (2013) "Analysis of specific speed testing for cricketers" HYPERLINK "<http://www.ncbi.nlm.nih.gov/pubmed/23439342>" \o "Journal of strength and conditioning research / National Strength & Conditioning Association." J Strength Cond Res., pp.2981-82. HYPERLINK "http://www.ncbi.nlm.nih.gov/pubmed?term=Noakes%20TD%5BAuthor%5D&cauthor=true&cauthor_uid=11138982" Noakes TD, HYPERLINK "http://www.ncbi.nlm.nih.gov/pubmed?term=Durandt%20JJ%5BAuthor%5D&cauthor=true&cauthor_uid=11138982" Durandt JJ (2000) "Physiological Requirements of Cricket" HYPERLINK "<http://www.ncbi.nlm.nih.gov/pubmed/11138982>" \o "Journal of sports sciences." J Sports Sci., pp.919-29. HYPERLINK "<http://www.sciencedirect.com/science/article/pii/S1466853X13000151>" Tom K. Tong, HYPERLINK "<http://www.sciencedirect.com/science/article/pii/S1466853X13000151>" Shing Wu & HYPERLINK "<http://www.sciencedirect.com/science/article/pii/S1466853X13000151>" Jinlie Nie (2013) "Plank Test for Evaluation of Core Muscle".