

Construction and Development of Specific Physical Fitness Test and Norms for Male Medium Fast Bowlers of Central Zone

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Abstract: *The purpose of this study was to construct specific physical fitness test and norms for male medium fast bowlers of central zone. The subjects selected for the study were 100 National Level male fast bowlers from Central Zone. The age group of subjects ranging between 17 to 23 years. In order to select a specific fitness test items, first of all a list of selected test items was finalized by keeping in mind the relevance of measuring the physical fitness of fast bowlers. A clear and systematic list of selected 21 fitness items of eight specific variables that are closed to the performance of fast bowlers were drawn out. The eight variables are strength, speed, aerobic fitness, anaerobic fitness, flexibility, agility, reaction time, balance and coordination. The data on selected test items was collected from national level medium fast bowlers of gwalior, indore, jabalpur, bhopal, agra, allahbad, kanpur, lucknow, jaipur etc. Factor analysis technique was used a tool to select test items out of 21 test items best suited to measure specific physical fitness of male medium fast bowlers which was serve as a comprehensive specific physical fitness test. Ten test items were drawn from each factor having the highest loading to constitute a specific physical fitness test battery for national level male medium fast bowlers of central zone. Norms were constructed by collecting data on the ten test item of newly constructed specific physical fitness battery by using 150 male fast bowlers at national level from central zone. The T-scale was used to prepare the norms for specific physical fitness test for national level male medium fast bowlers at central zone.*

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INTRODUCTION

Fitness is the key to good health. Along with eating healthy, exercising every day can keep your body fit and reduce your chances of heart attack or stroke. A healthy body also usually means a longer and more enjoyable life, without worrying about obesity-related and other illnesses, like diabetes and asthma (especially after retirement), and can make you feel younger and more active. Fitness is also useful in many other aspects of life. Besides getting that in physical education class, being fit and healthy means that a person has more stamina and better conditioning to work on those tough jobs that require carrying heavy loads and working long hours at the desk without falling asleep. Moving furniture require carrying heavy things, as does grocery shopping (for those that spend \$200-\$300 on groceries per week) If you're working on a farm, you

***Sports Officer, Govt. M.L.B. Girls P.G. College, Indore** especially have to have very good conditioning, as carrying hay bales, raking, and gathering straw and hay for 14 hours a day can be especially grueling. Having some extra strength at hand is good for getting out of tough spots, as everyone has once in a while.

Fitness is useful in playing sports; with good conditioning a person can be there when his team needs him most, and spend more time on the field, instead of resting on the bench.

Physical fitness is an important aspect in preparing for a career as a fast bowler. Today the fast bowler must train to play whereas many fast bowler of yester year were able to play to train because they led a more active life style – for example, they have worked as miners or timber workers, rather than students or office workers. Physical fitness, technique practice and the proper mental preparation are all important components in successful fast bowling. Because fast bowling causes severe pressure and trauma to muscles, joints and bones, specific fitness programs are essential and should be superimposed upon a strong general level of fitness. This follows the adage of generalization before specialization. Poor physical preparation can predispose one to premature tiredness and cause a lack of concentration, resulting in a lesser performance. Lack of fitness can also be a cause of injury. Therefore, it is necessary for both the aspiring and the experienced fast bowler to attain high level of aerobic and anaerobic fitness, muscular endurance and strength, plus retain

adequate level of flexibility. The well prepared fast bowler will then be able to operate at a high level of intensity over repeated spells without becoming unduly fatigued. A high level of aerobic fitness will also assist the fast bowler to bowl effectively through out the season. Training programs to improve muscular endurance, strength and flexibility enable the muscle group involved in fast bowling to contract sequentially in a co-coordinated way. This generates the power necessary for successful fast bowling performance without "fitness fanatics" and has paid special attention to all aspects of their training programme.

Fast bowling in cricket involves the projection of ball with maximum velocity towards the opposite end of wicket at a distance of 66 feet. Physical variables namely arm strength, shoulder strength, agility, flexibility, balance, speed etc play a very vital role in most of the games and sports. A fast bowler requires a specific amount of strength, power, speed, agility, flexibility etc. Almost every fast bowler has to run over a dozen yards to execute a delivery so that the entire above factor are sufficiently balanced and coordinated to utilize them when he reaches the crease.

Speed with which an individual can react in a given situation has been of great concern and interest to sportsman and trainers. Speed has an immense importance for a fast bowler. Physiological variables also play an important role in fast bowling. It is evident that there is a growing realization of importance of physiological variables such as resting heart rate, vital capacity, anaerobic capacity etc. The variables of body composition, anaerobic and aerobic capacities all play an important role in fast bowling in cricket. Body composition has been considered as vital factor, which contributes to fast bowling. The greater the muscle mass the more the force exerted by a bowler. Vital capacity is one of the important variables for fast bowling. Body composition in certain sports indicates that the athletes who are very lean but heavy because of a well-developed musculature are superior in performance. Excess of lean body mass will help an individual to generate more force as well as power which are required in majority of the games and sports.

METHODOLOGY

The subjects selected for the study were 100 National Level male fast bowlers from Central Zone. The age group of subjects ranging between 17 to 23 years. In order to select a specific fitness test items, first of all a list of selected test items was finalized by keeping in mind the relevance of measuring the physical fitness of fast bowlers. A clear and systematic list of selected 21 fitness items of eight specific variables that are closed to the performance of fast bowlers. The eight variables are

strength, speed, aerobic fitness, anaerobic fitness, flexibility, agility, reaction time, balance and coordination. The data on selected test items was collected from National level medium fast bowler. Research Scholar visited Gwalior, Indore, Jabalpur, Bhopal, Agra, Allahbad, Kanpur, Lucknow, Jaipur etc. Factor analysis technique was used a tool to select test items out of 21 test items best suited to measure specific physical fitness of male medium fast bowlers which was serve as a comprehensive specific physical fitness test.

The Correlation Matrix of the inter-correlation between the 21 test items were obtained by applying Person's Product Movement method. The factor analysis technique was applied by using the principal component analysis (Unrotated factor loading and varimax rotation). Norms were constructed by collecting data on the ten test item of newly constructed specific physical fitness battery by using 150 male fast bowlers at National level from Central Zone. The T-scale was used to prepare the norms for specific physical fitness test for national level male medium fast bowlers at central zone.

FINDINGS

The data collected on 100 male medium fast bowlers of central zone were subjected to factor analysis utilizing the principal axis form of preliminary solutions and the possible source of variance among the variables was undertaken. Utilizing Pearsons product moment correlation a matrix of inter correlation among the 21 test items was obtained. Correlation matrix obtained from the 21 test items was used in principal component analysis, with the help of principal component analysis, all the 21 test items were divided into various factors. By using the Kaiser criteria suggested by Guttman only those factors having latent roots greater than one were considered as common factors.

Owing to these criteria, ten factors were retained. The significance of factor loading was depended on the sample size. Field recommends that for a sample size 100 the loading should be greater than 0.512 and this value is based on alpha level of 0.01 (Two tailed). So in the present study the interpretation of factors has been focused around those test items, which had loading greater than or equal to ± 0.51 by rounding up the last digit.

Table 1

Rotated Factor Loadings

(Varimax Solution)

S.No	Test Variables	Factors									
		I	II	III	IV	V	VI	VII	VIII	IX	X
1	Pull-ups	.81	.26	.22	.13	.18	-.04	-.11	.23	.09	.16
2	Push-ups	.34	.09	-.66	.23	.09	.38	.07	.05	.06	-.05
3	12minRun/Walk	.10	.06	-.21	-.05	-.06	.12	.69	.33	.13	-.20
4	Phosphate Recovery Test	.36	.36	.86	.06	-.06	.05	.12	.06	.14	-.12
5	Sit-ups	.04	-.14	.12	.80	.11	.01	.17	-.14	.09	.40
6	3X17.7 mts Run	.30	.02	.16	.27	.06	.43	.02	.09	-.08	.61
7	Standing Broad Jump	-.14	.79	-.05	.14	-.01	-.13	.06	-.09	.06	.01
8	Ball Throw for Distance	.59	.08	.47	.41	.22	.30	.18	.10	.22	-.03
9	30 mts Run	.22	.42	.01	-.07	.17	.79	-.02	.17	.12	-.21
10	50 mts Run	.02	.64	-.02	-.09	-.06	.10	.04	.03	-.04	.07
11	600 yard run	.06	.16	.64	.13	-.02	.20	-.06	-.01	.10	.20
12	Harvard Step Test	.36	-.05	.04	-.17	.04	.01	.84	.01	.31	.03
13	Bridge up Test	.30	.05	.06	.09	.12	.08	.06	.81	.12	.03
14	Sit and Reach	.25	-.08	-.06	.66	.23	.07	.07	-.16	.20	.01
15	BoomerangTest	-.01	.01	.30	.17	.67	.06	.17	-.13	.30	.09
16	Dodging Run	.24	.16	.04	.17	.09	.09	-.08	.17	.83	.17
17	Nelson Hand Reaction	.20	.04	.09	.09	.20	.61	.14	.21	-.14	-.01
18	Six Second Dash	.06	.02	.14	.10	.19	-.05	-.10	.19	.17	.84
19	Stork Stick Test	.20	.01	.11	-.17	.09	.06	.19	.66	.18	-.13
20	Bass Stick Test	.14	.12	-.17	.11	-.06	.41	.29	.17	.67	.09
21	Lateral Jump	.16	.07	.23	.32	.83	.28	-.06	.21	-.02	.06

Table 2

Final Test Battery of Specific Physical Fitness For National Level Male Medium Fast Bowlers of Central Zone

S.NO.	FACTOR MEASURED	TEST ITEM	FACTOR LOADING
1	Strength(Arm)	Pull-ups	0.81
2	Strength(Leg)	Standing Broad Jump	0.79
3	Strength (Abdominal)	Sit-ups	0.80
4	Anaerobic Fitness	Phosphate Recovery	0.86
5	Balance & Coordination	Lateral Jump	0.83
6	Speed	30 mts Run	0.79
7	Aerobic Fitness	Harvard Step	0.84
8	Flexibility	Bridge up	0.81
9	Agility	Dodging Run	0.83
10	Reaction Time	Six Second Dash	0.84

Following the above mentioned step, ten test items were drawn from each factor having the highest loading to constitute a specific physical fitness test battery for national level male medium fast bowlers of central zone.

Table 3

Norms of Specific Physical Fitness Test Battery

Points	Pull ups	Standing Broad Jump	Sit ups	Phosphate Recovery Test	Lateral Jump	30 meters Run	Harvard Step Test	Bridge Up Test	Dodging Run test	Six Second Dash
100	31	3.40	82	102	40	3.34	3.34	85.98	8.93	48.88
90	28	3.19	76	97	37	3.75	3.75	79.99	10.15	45.37
80	26	2.98	70	92	34	4.16	4.16	74	11.37	41.86
70	23	2.77	64	87	31	4.57	4.57	68.01	12.59	38.35
60	21	2.56	58	82	28	4.98	4.98	62.02	13.81	34.84
50	18.24	2.35	52.74	77.16	24.74	5.39	5.39	56.03	15.03	31.33
40	15	2.14	46	72	22	5.8	5.8	50.04	16.25	27.82
30	13	1.93	40	67	19	6.21	6.21	44.05	17.47	24.31
20	10	1.72	34	62	16	6.62	6.62	38.06	18.69	20.8
10	8	1.51	28	57	13	7.03	7.03	32.07	19.91	17.29
0	5	1.3	22	52	10	7.44	7.44	26.08	21.13	13.78

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