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TALENT IDENTIFICATION IN HOCKEY FROM THE SELECTED KINANTHROPOMETRIC, MOTOR & PHYSIOLOGICAL FACTORS AND TO CONSTRUCT A SPECIFIC TEST BATTERY

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Abstract

The purpose of the study was to identify the talent in Hockey from the selected kinanthropometric, motor and physiological factors and construct a specific test battery. To achieve this purpose, thirty female inter collegiate Hockey players from various colleges in and around Trichy city, Tamil nadu state, India were randomly selected as subjects. The age of these subjects ranges from 18 to 23 years. The selected kinanthropometric, motor and physiological factors were assessed using twenty one testing items. The data obtained from the subject on twenty one testing items were subjected to descriptive analysis in order to have an idea about the characteristics of all the test items. Further inter correlation matrix among the variables was obtain which was further analyzed by Varimax rotation method as a final solution method to reduce the test items into minimum number for developing a test battery for hockey players.

Key words*; Talent identification, Kinanthropometric, Motor and Physiology*

Introduction

Nothing unites people, nation, societies, individuals quite like sports. Competitive sports have become passion of the universe. At the international level, winning the medal enhances the prestige of a nation .In modern life those who participate in sports attach great significance to winning as the philosophy of participation in games and sports has undergone a noticeable change. This excellence and success can be achieved only through a scientifically well planned and systematic sports training programmes. Minimizing the elements of chance by trying to leave no stone unturned in the quest for coaching excellence is the corner stone of all sports scientists' thinking. When athletes roughly equal in Skills Meet, the one with the higher overall fitness level will have the advantage of being more able to cope with the demanding pace of the competition. There is an increasing demand with regard to fitness, skill and related capabilities of sportsmen,

since performance can be considered as one of the major aspect of competition. Hence, there is a need to pay attention to physical fitness in general and specific fitness in particular which determines to a great extent. In the recent past there has been a more systematic search and spot talents and in determining the combined factors responsible for ultimate success. The sports scientist working with the top coaches in the sports concerned single out the basic physical characteristics and psychological factors which might be performance limiting factors. Due to our poor performance at the international competitions a great concern has been shown to draw out long term plan for selecting and training sportsmen. One major problem controlling sports experts is to draw out certain criteria for selecting children at the youngest possible age who would be the potential champion of tomorrow. This study is an initial step in this direction.

In the past many have constructed skill tests in Hockey namely Schmitals and French (1940), Friedel (1956), Singh (1959), Strait (1961), Illner (1969), Henry (1970), Dangwal (1980), Chapman (1982), Dureha (1985), Nirmala (1985), Kirubakaran (1986), Sangral (1986), Damras et. al (1990), Nieuwenhuis et. al (2002), Keogh et. al., (2003), Lenmink et.al (2004), Burr et. al., (2007), Gabbett (2010), Kasiviswanathan (2010), Sureshkumar and Kalidasan (2010).

The purpose of the study was to identify the talent in Hockey from the selected kinanthropometric, motor and physiological factors and construct a specific test battery.

Materials and Methods

Thirty female inter collegiate Hockey players from various Arts and Science colleges in and around Trichy city, Tamil nadu state, India were randomly selected as subjects. The age limits of these subject range from 18 to 23 years. For this investigation kinanthropometric factors namely height, weight, sitting height, biepicondylar humerus width, biepicondylar femur width, upper arm girth, calf girth, fat percent; motor variables such as speed, strength, endurance, explosive power, agility and physiological parameters namely resting pulse rate, air flow rate and peak flow rate. The data obtained from all the 30 subjects on twenty one testing items were subjected to descriptive analysis in order to have an idea about the characteristics of all the test items. Further, inter-correlation matrix among the variables was obtained which was further analyzed by factor analysis by using the principal component analysis and varimax rotation method as the final solution method to reduce the test items in to minimum number of developing a test battery for Hockey players.

Analyses and interpretation of data

The descriptive analyses in the scores of all the test items have been shown in Table-I

TABLE-I

Sl.No.	Variables	unit	Mean	SD (±)
1	Weight	Kg	53.54	6.43
2	Height	cm	164.65	8.23
3	Sitting height	cm	85.20	4.36
4	Biepicondylar humurus width	cm	6.36	0.36
5	Biepicondylar femurs width	cm	9.20	0.51
6	Upper arm Girth	cm	23.37	2.54
7	Calf girth	cm	31.45	2.56
8	Three consecutive jump	cm	645.47	57.37
9	Flexed arm hang	sec	73.19	18.76
10	Flexed leg sit ups	nos	45.57	6.37
11	Basket ball throw	mts	19.28	3.13
12	Standing broad jump	cm	220.05	20.47
13	30 mts run	sec	4.72	0.33
14	50 mts run	sec	7.46	0.44
15	4*10 mts shuttle run	sec	10.31	0.49
16	Fan test	sec	27.53	2.74
17	2.4 km run	sec	9.34	0.97
18	Pulse rate	Beat/min	73.25	7.75
19	Peak flow rate	L/min	498.17	122.68
20	Air flow rate	L/min	61.5	34.41
21	Fat percent	Percentage	10.55	2.70

TABLE-II

Rotated factor loading of Hockey players

Varimax solution

S.no	Variables	Factor-I	Factor-II	Factor-III	Factor-VI	
1	Pulse rate	0.07	-0.09	-0.08	0.73	0.56
2	Peak flow rate	0.02	-0.40	-0.53	-0.28	0.53
3	Air flow rate	-0.00	-0.07	0.15	-0.44	0.22
4	Weight	-0.85	0.18	0.22	0.05	0.82
5	Height	-0.78	-0.27	-0.01	-0.31	0.79
6	Sitting height	-0.86	-0.11	-0.12	-0.19	0.81
7	Biepicondylar humurus width	-0.77	-0.31	0.09	-0.14	0.73
8	Biepicondylar femurs width	-0.63	-0.63	0.12	0.08	0.83
9	Upper arm Girth	-0.55	0.17	0.28	0.54	0.71
10	Calf girth	-0.72	0.24	0.13	0.23	0.65
11	Three consecutive jump	-0.08	-0.39	0.80	-0.10	0.81
12	Flexed arm hang	0.36	-0.36	0.03	-0.01	0.26
13	Flexed leg sit ups	0.11	-0.20	0.35	0.49	0.44
14	Basket ball throw	-0.26	0.03	0.76	-0.15	0.68
15	Standing broad jump	0.04	-0.16	0.78	-0.15	0.67

16	30 mts run	0.12	0.75	-0.07	-0.1	0.61
17	50 mts run	0.12	0.52	-0.18	0.48	0.55
18	4*10 mts shuttle run	-0.11	0.61	-0.26	0.43	0.65
19	Fan test	-0.23	0.50	0.21	0.18	0.38
20	2.4 km run	0.08	0.71	0.09	0.15	0.55
21	Fat percent	-0.48	0.35	-0.20	0.41	0.58

In below Factor-I shown characterized by variables which pertain to kinanthropometric components. This factor could be thus named as physique. The items which were heavily loaded in this factor were body weight, height, biepicondylar width and calf girth. In term of relative contribution this factor accounted for 34.91% of the total common factor variance accounted for by the four factors.

Factor-II characterized by loading in those items which measure the speed of movement and endurance. This factor could be thus named as speed and endurance components. The items which were heavily loaded in this factor were, biepicondylar femur width, 30 mts run, 4*10 mts shuttle run, 2.4 km run. In terms of relative contribution this factor accounted for 26.18% of the total common factor variance accounted for by the four factors.

Factor I

Variables	Factor loading
Body mass	-0.85
Stature	-0.78
Sitting height	-0.86
Biepicondylar humurus width	-0.77
Biepicondylar femurs width	-0.63
Calf girth	-0.72
Fat percent	-0.48
Upper arm Girth	-0.55

Factor II

Variables	Factor loading
Peak flow rate	-0.40
Biepicondylar femurs width	-0.63
30 mts run	0.75
5o mts run	0.52
4*10 mts shuttle run	0.61
Fan test	0.50
2.4 km run	0.71

Factor III

Variables	Factor loading
Peak flow rate	-0.53
Standing broad jump	0.78
Threeconsecutive jump	0.80
Basket ball throw	0.76

Factor IV

Variables	Factor loading
Pulse rate	0.73
Air flow rate	-0.44
Upper arm Girth	0.54
Flexed leg sit ups	0.49
5o mts run	0.48
4*10 mts shuttle run	0.43
Fat percent	0.41

In factor-III the items having the highest loading denote those variables which involved strength and speed of release of force. This factor could be thus named as power component. This factor accounted for 20.89% of the total common factor variance accounted for by the four factors. Factor-IV consisted of seven variables. This factor was term as endurance, speed, strength component. This factor accounted for 17.99% of the total common factor variance accounted for by the four factors.

The pulse rate found in Hockey players indicates general fitness of the physiological functioning of the body. Hockey players had greater Biepicondylor femur width. This proves the fact that Hockey is the game which involves total action of leg and then greater width of femur condylor, meant greater bone thickness and the more stress bearing capacity. On the basis of factor analysis two test batteries could be suggested for Hockey players. Battery–I included Sitting height, 30 mts run, three consecutive jumps, pulse rate and 2.4 km run.

Battery–II included sitting height, 30mts run, three consecutive jump, pulse rate, 2.4 km run, standing broad jump and upper arm girth.

Conclusion

On the basis of the result of the present investigation the following conclusion were made.

1. Hockey players had the lowest pulse rate recorded and highest performance recorded in the case of biepicondylar femur width. This meant these two variables were important factors for successful performance in Hockey. Speed and agility were other important factors.
2. For the selection of Hockey players a test battery consisting of sitting height, 30 mts run, three consecutive jump, pulse rate and 2.4 km run might be used. To increased additional two items standing broad jump and upper arm girth could be added as alternate battery.

Recommendation

Similar study may be conducted on male players and also on other games and athletics.

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