Construction of Hitting Test in Hockey

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ABSTRACT

The purpose of the study was to construct Hitting Test in Hockey. Ninety-eight male hockey players from all the seven university teams of Madhya Pradesh State, who participated in Madhya Pradesh State University Hockey Tournament, were selected to serve as subjects for this study. The criterion measure was the average of the playing ability scores of Hockey players assigned independently by three Hockey experts. It was concluded that the newly developed 16 - Yards Hitting Test in Hockey meet the criterion of specific authenticity i. e. the test was reliable, objective and valid, and showed high significant relationship with hockey playing ability.

Key words: Criterion, Reliability, Objectivity, Validity, Scientific Authenticity.

As the field of physical education and sports is becoming more and more keen and competitive, the attention is being directed by the physical education teachers and sports scientists to the best teaching and training programmes to enhance the best possible results. Hockey is one of the most popular sports in the world. No one knows hockey's birthplace, but generally accepted as having been played for over two thousand years. Hockey is a game of masterful skill and deception, anticipation and concentration. It is an exhilarating game while fulfils the love of being out of doors sometimes regardless of the weather and enjoyment of running through how much depends upon the position you choose to play. Today hockey is essentially a team game and had developed into a fast and highly skillful one requiring the ability to master a ball with a stick. Physical strength particularly in the fore-arms and wrists plays an important role in development of speed of movement over short distance. The purpose of the study was to construct 16 - Yards Hitting Test in Hockey.

Methodology:

Ninety-eight male hockey players from all the seven university teams of Madhya Pradesh State, who participated in Madhya Pradesh State University Hockey Tournament, held at Barkatullah University, Bhopal (M.P.) from 24th to 26th September 2006, were selected to serve as subjects for this study. The age of the subjects ranged between 18 to 25 years. The criterion measure was the average of the playing ability scores of Hockey players assigned independently by three Hockey experts.

The 16 - Yards Hitting Test was developed through objective methods by administering the 16 - Yards Hitting Test on all the players.

The Coaches and managers of the teams were consulted at personal level to conduct the tests on Hockey players, and a rapport was established with them for the testing programmes. All those in charge of teams, coaches and managers were made fully conversant with the study. Tentative times were finalized with them. The researcher approached each player after giving proper and timely information before the tests were conducted. Before administering the tests, the subjects were briefed about the purpose of the study and details of the test were explained to them. The subjects were given a demonstration of the test by a trained helper. They were also given sufficient number of trials to enable them to become absolutely familiar with the test. To ensure uniform testing conditions, the subjects were tested in the morning and evening sessions after warming-up during practice sessions, prior to the competition. The duration of test administration was set in a manner so that fatigue may not occur. Sufficient time was given in between the tests, so that the subjects could show their best performance. The subjects were directed to come in proper kit during the performance of test. Though no special technique was used to motivate the subjects, the subjects were very co-operative throughout the project. Test was administered on Hockey Ground at the Tournament sites. In the Hockey field inside the shooting circle, three hitting squares of 2×2 Yards were marked at an angle of 60° to the right and left, and at 90° in the center. A hitting target board 4 yards in length and 18 inches above the ground was placed on the goal line. The target board was marked with the numbers 5, 4, 3, 2, 1, 2, 3, 4 and 5 of equal width. The player stood inside the hitting square with the Hockey stick and a ball. The ball was placed just inside the hitting

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square. With the sound of the whistle the player tried to hit the ball on the target board and attempted to score highest possible points. Points were awarded according to the numbers on which the ball was hit by the player on the target board. No point was awarded for missing the target board. Every player was given ten chances in each trial from each angle and best score of the three trials was reckoned as the final score of the player. A maximum score of 50 was possible on this test. If a ball hit between the two numbers, the higher point value was awarded to the player.

Results and Discussion:

The Correlation coefficients of 16 - Yards Hitting Test scores through objective criteria and the criterion variable has been presented in Table-1.

Table – 1: Relationship of specific skill test scores to the criterion (N=14)

S. No.		Variable Correlated	Correlation coefficient (r)
1.	1a	16-Yards Hitting Test	0.812*
2.	1b	20-Yards Hitting Test	0.418
3.	1c	25-Yards Hitting Test	0.328

* Significant at 0.05 level $r_{0.05}(12) = 0.532$

It is evident from Table - 1 that there is significant relationship between 16 - Yards Hitting Test and the criterion. Out of three tests one with higher validity value was selected. Thus 16 - Yards Hitting Test (0.812) was selected.

Further comparison of the performance on the tests among National, University and College level hockey players (N=14) was made. The analysis of data pertaining to comparison among National, University and College level hockey players on 16-Yards hitting test has been presented in Table-2.

Table – 2: Comparison of national, university and college hockey players on 16-yards hitting test (N=14)

Source of Variance	Sum of Squares	Degree of Freedom	Means Sum of Squares	F ratio
Between Groups	724.62	2	362.31	
				104.50*
Within Groups	135.21	39	3.467	
	859.83	41		

* Significant at 0.05 level   tab $F_{0.05}(39, 2) = 3.37$

As the F-ratio was found to be significant, Least Significance Difference (L.S.D.) test of Post-Hoc comparisons was applied to study the significance of difference between the means of National, University and College level hockey players on 16-Yards Hitting Test. Data pertaining to this has been presented in Table-3.

Table - 3: Significance of difference between the means of national, university and college level hockey players for 16-yards hitting test (N=14)

S. No.	Mean Scores			Paired Mean	Critical Difference
	National	University	College		
1.	29.86	23.64	-	6.21*	1.42
2.	-	23.64	15.5	8.14*	1.42
3.	29.86	-	15.5	14.36*	1.42

* Significant at 0.05 level

It is evident from Table-3 that there is significant difference among National, University and College level Hockey players in 16 - Yards Hitting Test on Hockey. The mean differences of 6.21, 8.14 and 14.36 respectively are higher than the critical difference of 1.42 and are significant at 0.05 level.
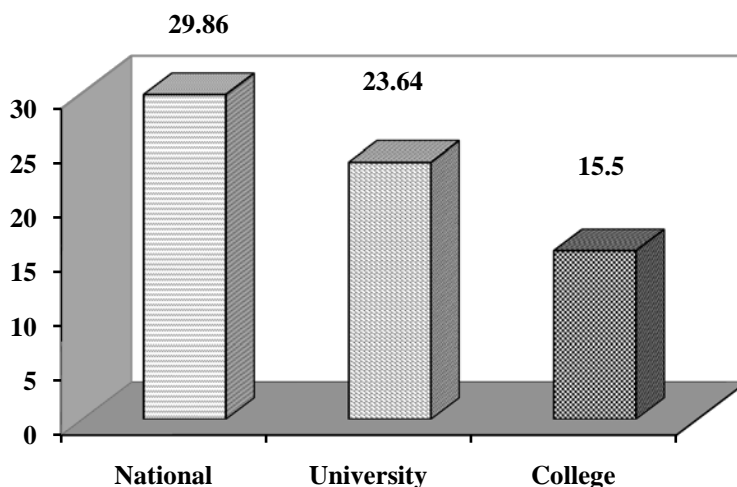
 Fig. 1: MEAN SCORES OF 16 - YARDS HITTING TEST FOR NATIONAL, UNIVERSITY AND COLLEGE LEVEL HOCKEY PLAYERS

The test-retest method using inter-class correlation coefficient by analysis of variance method was employed to compute the reliability of the test items. Analysis of variance for reliability estimates for the specific skill tests has been presented in Table-4.

Table – 4: Analysis of variance for reliability estimate of 16-yards hitting test (N-98)

Source of Variance	Sum of Squares	Degree of Freedom	Mean Squares	F-ratio	Tab-F	R
Subjects	1446.901	97	14.917			
Trials	13.252	2	6.626	1.979*	3.09	0.776**
Interaction	649.415	194	3.347			
Total	2109.568	293				

* Not Significant at 0.05 level   tab F $_{0.05}$(97, 2) = 3.09   **r $_{0.05}$(96) = 0.195

Test retest method was used to establish the objectivity of the specific skill tests in Hockey. All the subjects were given three trials through three different testers and inter class correlation coefficients by analysis of variance using test-retest method was employed to compute the objectivity of all the test items. The data obtained as a result of administration of each test item is separately presented Table -5.

Table – 5: Analysis of variance for objectivity estimate of 16-yards hitting test (N = 98)

Source of Variance	Sum of Squares	Degree of Freedom	Mean Squares	F-ratio	Tab-F	R
Subjects	1383.850	97	14.266			
Trials	2.905	2	1.452	0.361*	3.09	0.718**
Interaction	779.762	194	4.019			
Total	2166.517	293				

* Not Significant at 0.05 level   tab F $_{0.05}$(97, 2) = 3.09   **r $_{0.05}$(96) = 0.195

6 σ scale norms were prepared for indicating the relative position of an individual in a group that scored below a given score. The data based on test scores for preparation of norms has been presented in Table - 6.

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Table – 6: Norms for 16 – yards hitting test in Hockey (N=98)

	16-Yards Hitting Test Max. (50 pts)
10	08
20	10
30	13
40	16
50	19
60	22
70	25
80	27
90	30
100	33

M = Mean   σ = Standard Deviation $M_1 = 18.429$ $σ_1 = 4.725$

Analysis of data on 16 - Yards Hitting Test indicated that the constructed in hockey is reliable. The findings of the study further reveal that the 16 - Yards Hitting Test in hockey was found to be objective. The significant values showed that the directions for administration of various tests were specific and clear for performance as well as evaluation.

Conclusions:

1. The specific skill test developed by the researcher has the ability to assess the selected specific skills of hockey players of college and university level. 2. 16-Yards Hitting Test showed highly significant relationship with hockey playing ability. 3. The newly developed selected specific skill test meet the criterion of scientific authenticity i.e. the test was reliable, objective and valid. 4. The 6 - σ norms developed by the researcher for 16-Yards Hitting Test has the ability to evaluate the specific skill of hockey players.

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