



Quantitative Analysis and Norm Development for Assessing Male Hockey Player Performance

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VOLUME 08
ISSUE 05
YEAR 2025

RECEIVED 15 April 2025
ACCEPTED 14 May 2025
PUBLISHED 20 May 2025

CITATION

Dhiman, S., Kumar, P. (2025). Quantitative Analysis and Norm Development for Assessing Male Hockey Player Performance. *The Scholars Time: A Multidisciplinary Journal of Research and Development*. 8 (05). pp-01-06



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ABSTRACT

This study aimed to develop standardized norms for evaluating specific hockey skills in male players aged 17 to 21 years. Recognizing the need for objective assessment tools in field hockey, the research focused on constructing a reliable and valid skill test battery. A sample of 200 male hockey players from various competitive levels—including SGFI, Inter-College, Inter-University, State, and National—participated in the study. Seven skill tests were administered: Zig-zag Dribbling (20m), Moving/Rolling with Ball (20m), Pushing the Ball on a Target, Four Slap Shots at the Target, 30m Dash without Ball, Hitting Four Balls on the Target, and Overall Circuit Time. A pilot study with 20 participants ensured the feasibility and effectiveness of the test items. Descriptive statistics were calculated, and Sigma scales were developed to establish performance norms. The results facilitated the classification of players into categories: Outstanding, Excellent, Very Good, Good, Average, Below Average, and Poor. These norms provide coaches and physical education teachers with a scientific basis for assessing player performance, identifying talent, and tailoring training programs. The study underscores the importance of standardized evaluation methods in enhancing the objectivity and fairness of skill assessment in field hockey.

KEYWORDS

Norms, Skill test in Hockey, Sigma scale.

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INTRODUCTION

Games and sports play a vital role in human development by fostering physical fitness, teamwork, and strategic thinking. However, assessing performance in these activities requires standardized and objective evaluation methods. The establishment of norms for grading performance is essential to ensure fairness, consistency, and accuracy in determining skill levels and achievements. These norms provide a structured framework for evaluating athletes and players, allowing for meaningful comparisons and improvements in performance. One of the primary reasons for constructing norms in grading performance is to ensure fairness. Different sports and games have varying levels of complexity, requiring distinct skills and attributes. Without clear grading norms, evaluations may be subjective, leading to biases and inconsistencies.

Establishing standardized criteria enables all players to be assessed on equal terms, eliminating disparities caused by personal opinions or favoritism. For instance, in competitive sports such as gymnastics, figure skating, and diving, where performance is judged based on skill execution, a well-defined grading system ensures that all participants are evaluated using the same parameters. This fairness fosters a sense of trust in the system and motivates athletes to strive for excellence. Sports performance can be influenced by various factors, including physical abilities, technical skills, and strategic decision-making. Without proper grading norms, the evaluation process may become subjective and inconsistent. Objective performance measurement helps in accurately assessing an athlete's progress and capabilities.

Statement of the Problem

Evaluation is essential in the process of coaching and teaching. Through evaluation the teacher/coach can know the extent to which learning has taken place. Hence research scholar was interested to take the study stated as **"Quantitative Analysis and Norm Development for Assessing Male Hockey Player Performance"**.

Purpose of the Study

- The objective of the present study was to construct standard norms for the Male Hockey Players.

Significance of the Study

- The study will help in identifying talented male hockey players through the development of standardized, sport-specific skill-related fitness tests.
- It will provide objective and scientific tools for evaluating the physical and skill components necessary for successful hockey performance.
- The research will improve the selection process of players by offering reliable and valid criteria for assessing performance.
- It will assist coaches in designing targeted training programs by identifying specific strengths and weaknesses in players.

Materials and Methods

For this study, a sample of 200 male hockey players who had participated in competitions at various levels, including SGFI, Inter-College, Inter-University, State, and National levels, and were undergoing coaching at recognized hockey academies. The performance scores of these athletes formed the basis for the development of standardized norms using the Sigma Scale.

Method of Pilot Study

A pilot study was conducted on a sample of 20 subjects to identify any potential challenges or shortcomings in the newly developed hockey skill test circuit. This preliminary

phase was essential to ensure that the test was practical, functional, and capable of measuring the intended skills effectively. Based on the feedback and performance in the pilot study, the test circuit was refined and finalized for full-scale data collection. In this process the research scholar has taken 7 test items namely:

1. Zig-zag Dribbling for 20 meters (in sec.)
2. Moving/Rolling with ball for 20 meters (in sec.)
3. Pushing the ball on a target (accuracy test)
4. Four Slap shot at the target (accuracy test)
5. 30m dash without ball (in sec.)
6. Hitting the four balls on the target (accuracy test)
7. Overall circuit time (in sec.)

Statistical Treatment

The data obtained from all the skill test items were first subjected to descriptive analysis in order to have an idea about the characteristics of all the test items. Secondly, the data which was collected by administering tests were statistically treated to develop norms for all test items. The Sigma Scale were constructed. Further, the scores were classified into six grades i.e. outstanding, excellent, very good, good, average, below average, and poor.

Procedure for preparing the Sigma Scale:

Illustration: If the mean is 50.0 and the standard deviation is 5.0 on the Sigma Scale, the value of one decile point will be 1.5. The built scale will be as follows:

Decile	Score
100	57.5
90	56.0
80	54.5
70	53.0
60	51.5
50	50.0
40	48.5
30	47.0
20	45.5
10	44.0
0	42.5

Consequently, it is essential for physical education teachers and coaches to establish standards to facilitate the objective assessment of student performance in educational institutions. This would facilitate the allocation of marks to pupils based on their capabilities and augment the teacher's reputation.

Results and Discussions

The construction of Hockey Specific skill test was based on the administration of different skill test items to a sample of 200 male hockey players from various academies

and their age ranged between 17 and 21 years. The descriptive analysis of the scores of all the test items is shown in the Table -1.

Table 1: Descriptive Analysis of the Skill Test Items

Skill Test Items	Mean	SD	Minimum	Maximum
Zig-Zag Ball Dribble (20m)	6.71	0.82	4.21(Time in sec)	9.21(Time in sec)
Moving/Rolling the Ball (20m)	4.04	0.78	1.74(Time in sec)	6.34(Time in sec)
Push The Ball at Target (15m Away)	1.47	0.18	0.97(Score in points)	1.97(Score in points)
Four Slap Shots at Target (30m Away)	3.92	0.24	3.21(Score in points)	4.27(Score in points)
30m Dash Without the Ball	5.71	0.62	3.91(Time in sec)	7.51(Time in sec)
Hitting The Four Balls at Target	3.93	0.28	3.09(Score in points)	4.77(Score in points)
Overall Circuit Time	37.91	2.14	31.49(Time in sec)	44.33(Time in sec)

Development of Norms

A norm is a scale that permits conversion from a raw score to a score capable of comparisons and interpretations. It is obvious that if a test is accomplished by norms, its usefulness is enhanced. Its characteristics of average and range are known. Since, there is a lack of standardized evaluative criteria In Field Hockey for assessing the ability, grading and predicting the performance of Hockey players, an effort was undertaken to construct norms for Hockey Specific skill test for Hockey players were presented in table-2 &3.

Table-2 Sigma Norms for all the Skill Test Items

Score	Zig-Zag Dribble (20m) Time in sec.	Rolling the Ball (20m) Time in sec.	Sprint (30m) with Stick in hand Time in sec.	Slap Shot at the Target for Accuracy (Score)	Score
100	4.21	1.74	3.91	4.72	100
95	4.66	1.97	4.09	4.64	95
90	4.71	2.20	4.27	4.56	90
85	4.96	2.43	4.45	4.48	85
80	5.21	2.66	4.63	4.40	80
75	5.46	2.89	4.81	4.32	75
70	5.71	3.12	4.99	4.24	70
65	5.96	3.35	5.17	4.16	65
60	6.21	3.58	5.35	4.08	60
55	6.46	3.81	5.53	4.00	55
50	6.71	4.04	5.71	3.92	50
45	6.96	4.27	5.89	3.84	45
40	7.21	4.50	6.07	3.76	40
35	7.46	4.73	6.25	3.68	35
30	7.71	4.96	6.43	3.60	30
25	7.96	5.19	6.61	3.52	25
20	8.21	5.42	6.79	3.44	20
15	8.46	5.65	6.97	3.36	15
10	8.71	5.88	7.15	3.28	10
5	8.96	6.11	7.33	3.20	5
0	9.21	6.34	7.51	3.12	0

Table 3 Norms for Different Skills of Hockey Included in The Circuit (Sigma Scale)

Score	Hitting at the Target (Accuracy test)	Pushing the ball at the Target (Accuracy Test)	Completing Overall Circuit (Time in sec.)	Score
100	4.77	1.97	31.49	100
95	4.68	1.92	32.13	95
90	4.60	1.87	32.77	90
85	4.51	1.82	33.41	85
80	4.43	1.77	34.05	80
75	4.35	1.72	34.70	75
70	4.26	1.67	35.34	70
65	4.18	1.62	35.98	65
60	4.09	1.57	36.62	60
55	4.01	1.52	37.26	55
50	3.93	1.47	37.91	50
45	3.84	1.42	38.55	45
40	3.76	1.37	39.19	40
35	3.67	1.32	39.83	35
30	3.59	1.27	40.47	30
25	3.51	1.22	41.12	25
20	3.42	1.17	41.76	20
15	3.34	1.12	42.40	15
10	3.25	1.07	43.04	10
5	3.17	1.02	43.68	5
0	3.09	0.97	44.33	0

Discussion on Findings

The test developed has been found to possess scientific authenticity i.e. it has been found to be reliable, objective and valid and along with-it norms have been constructed so that the performance of Hockey players can be objectively graded. Sigma scale has been constructed so that the norms developed can be used for grading the performance of Hockey players over a long period of time. The physical education teachers as well as coaches can commence the grading process employing Sigma scale to evaluate the performance of the players has improved as a result of regular and systematic training. Keeping in mind the time and score for completing the overall circuit with above mentioned skills, the subjects of the study can be classified as follows:

Score	Grading
Above 90%	Outstanding
80% to 89%	Excellent
70% to 79%	Very Good
60 %to 69%	Good
50% to 59%	Average
40% to 49%	Below Average
Below 40%	Poor

Conclusions

The circuit developed by the research scholar comprised of all important skills that are frequently used in the game of Hockey and therefore it is assumed that the Hockey test constructed will be of great help for the physical education teachers as well as coaches to evaluate the performance of their Hockey players both for selecting them in the formation of institute hockey teams as well as to evaluate the effectiveness of their training and coaching programmes in Schools, Colleges of Physical Education and University Departments of Physical Education.

The above evaluation process will facilitate in continuous use of the norms without any interruption over a prolonged period. Teachers of physical education as well as coaches can begin the process of grading by employing Sigma Scale

Recommendations

1. The hockey specific skill test developed in this study might be used to evaluate the performance of male Hockey players.
2. The norms developed in this study will be help to the player to understand where he stands in terms of scores.
3. Similar study may be conducted with Hockey players of different levels such as under-17 and under-14 for both male and female.
4. Similar study may be conducted for other Ball Team Games.

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