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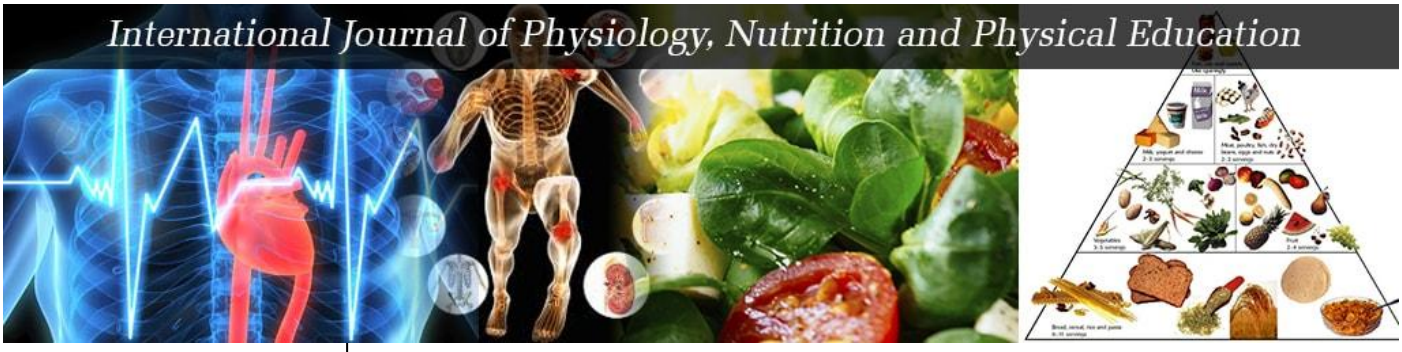

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Construction of skill test and norms for squash players

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Abstract
The purpose of this study was to construct a new skill test battery and to develop standard norms for Squash players. Initially 6 tests were designed on fundamental skills. A pilot study was conducted on 40 male Squash players from various clubs age ranged from 17 to 20 years. After extensive critical analysis 4 skill tests were finalized. Validity, reliability and objectivity were established on all selected test items. To arrive the final test battery 100 male Squash players were randomly selected from the LNIPE, Gwalior, Noida Stadium, Noida, Mayohall Sports Complex, Allahabad and their age ranged between 17 and 20 years with the mean age of 18.8, ± 1.9 years. The data, which was collected by administering the 4 skill test items i.e. Alternate Parallel Drive from Front Court, Parallel Drive from Back Court (Forehand and Backhand), and Court Run was statistically treated to develop norms for all the test items. The normative scales, namely, the Percentile Scale and 6-Sigma Scale were constructed for the male Squash players. The scores were further classified into five grades i.e. A, B, C, D and E or Excellent, Good, Average, Satisfactory and Poor respectively under normal distribution.

Keywords: Squash, Test, Battery, Scales

1. Introduction
Sports skill test are designed to measure the basic skills used in the playing of a specific sport. Because of the wide range of skills in the most sports, a selection of the most important skill is invariably necessary. The selection is usually based keeping in mind the literature available, opinion of experts as well as by applying appropriate statistical techniques. The skill items collectively are called test battery. The skill test helps the students to evaluate their performance in the fundamental skills the game and to provide an incentive for improvement. The test also serves the purpose of improvement. The test also serves the purpose of helping the teacher/coach to measure student's/player's performance and to evaluate their own teaching/coaching procedure and programme.
Norms are necessary if the test scores are to be adequately interpreted. There are several types and it depends on the purposes of the test and the characteristics of the group to be tested as to which type is selected. The procedure for developing norms starts with the collection of scores on the test from a large sampling of students from the population for which the test was intended. The large collection of scores can be converted into some type of normative scores. On the basis of these norms performance and achievement can be adequately evaluated, scores can be properly interpreted and groups can be compared 1.
There is a lack of standardized evaluative skill test in Squash for assessing the ability, grading, and predicting the performance of Squash players. Squash is a racket sport played by two (singles) or four players (doubles) in a four-walled court with a small, hollow rubber ball. The players must alternate in striking the ball with their racket and hit the ball onto the playable surfaces of the four walls of the court. The game was formerly called squash rackets, a reference to the "squashable" soft ball used in the game (compared with the harder ball used in its sister game rackets).

1.1 Review of Related Literature
John (2010) [10] developed and evaluated a battery of Soccer skill tests. For this purpose 250 varsity men Soccer players in the age group of 17 to 19 years were selected from fifteen colleges by random method of sampling from a population of 50 active varsity teams as Subjects for the study. All the test items included in this study were highly correlated. The

factor analysis yielded two factors which were named as 'playing ability by body' and 'ball playing ability'. The final test battery included the following skill tests namely heading for distance, throw-in, for distance, passing with the outside of the foot, zigzag dribbling and chest trapping. Finally a norm was developed for the selected test items using percentile, and a 6-sigma scale was developed for grading the overall performance.

Rosch *et al.* (2000) [16] developed a standardised test battery to evaluate physical performance in football players. The F-MARC test battery was designed to closely relate to the Football player's normal activity and comprised a functional, structured training session of approximately 2.5 hours. It included a "quality rating" of the warm-up procedure, tests of flexibility, football skills, power, speed and endurance. The players finished with a cool-down. A total of 588 Football players underwent the F-MARC test battery. Mean values for performance on each test are presented for groups of differing age and skill levels. The test battery proved to be a feasible instrument to assess both physical performance and Football skills.

1.2 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 "Construction of skill test and norms for squash players".

1.3 Purpose of the Study

The objective of the present study was to construct a new skill test battery and to develop standard norms for the Squash players.

1.4 Significance of the Study

The study would be significant on the following aspects:

- The newly developed skill test battery would help the physical educators and coaches to evaluate the players.
- The norms developed in this study would help the players and coaches to assess the skill level and make a comparison with others.
- The study would serve as a motivational force to the squash players.
- The study would be helpful in locating the potential in squash players.
- The study would provide coaches with realistic and objective information about the standard of the players.

2. Materials and Methods

For this study, players from Lakshmibai National Institute of Physical Education, Gwalior, Noida Stadium, Noida, Mayohall Sports Complex, Allahabad was the sources of data. 100 Male players from LNIPE, Gwalior, Noida Stadium, Noida, Mayohall Sports Complex, Allahabad was selected for this study. The age of the subjects was ranging from 17 to 20 years with the mean age of 18.8 ± 1.9 years. The subject had past experience of at least three years in Squash. Simple random sampling method was adopted for the present study.

2.1 Method of Pilot Study

The pilot study covered 40 Squash players for the purpose of selecting the variables and establishing the reliability, objectivity and validity coefficients of the test items. In this process the research scholar has taken 6 test items namely:

- Service from both the side
- Parallel drive from the backcourt (forehand and backhand both)
- Alternate parallel drive from the front court
- Volleying
- Cross court drive
- Court run

2.2 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 administrating tests were statistically treated to develop norms for all test items. Two scales, namely, Percentile Scale and 6 Sigma Scale were constructed. Further, the scores were classified into five grades i.e. excellent, good, average, satisfactory, and poor. The analysis was done by using Statistical Package for Social Science 12.0 for Windows and Microsoft Excel 2007. The level of significance was set at 0.05 levels.

3. Results and Discussions

The construction of Squash skill test battery was based on the administration of different skill test items to a sample of 100 male national level Squash players from various club and their age ranged between 17 and 20 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	Range	Minimum	Maximum	Mean	SD
Parallel Drive (Forehand)	14	5	19	9.84	3.13
Parallel Drive (Backhand)	11	4	15	9.19	2.42
Alternate Parallel Drive	14	8	22	13.26	3.26
Court Run	15.50	18.50	34	26	3.23

3.1 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 Squash for assessing the ability, grading and predicting the performance of Squash players, an effort was undertaken to construct norms for skill test battery for Squash players were presented in table-2.

3.2 Development of Grading Scale for Interpreting Playing Ability

All the individual performance of the skill test was converted as composite score. Based on the norms found in table-2 a 6-sigma scale, i.e. 3 standard deviations above the mean and 3 standard deviation below the mean was developed to calculate the playing ability scores which were given in table-3 to table-6.

Table 2: Percentile Norms for all the Skill Test Items

Test Items	Percentiles									
	10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
Parallel Drive (Forehand)	6	8	8	9	9	10	10	12	14	19
Parallel Drive (Backhand)	6	8	8	8	9	9	10	11	12	15
Alternate Parallel Drive	9	10	11	12	14	14	15	16	17	22
Court Run	21.50	23.50	24.50	25.50	25.50	26.50	27.50	29	30	34

Table 3: 6-Sigma for Parallel Drive (Forehand)

6-Sigma Scale	Scores
3σ	19.19
2σ	15.43
1σ	11.68
Σ	9.8
-1σ	7.92
-2σ	4.17
-3σ	0.41

Table 4: 6-Sigma for Parallel Drive (Backhand)

6-Sigma Scale	Scores
3σ	16.36
2σ	13.55
1σ	10.69
Σ	9.19
-1σ	7.69
-2σ	4.83
-3σ	1.93

Table 5: 6-Sigma for Alternate Parallel Drive

6-Sigma Scale	Scores
3σ	23.16
2σ	19.2
1σ	15.26
Σ	13.26
-1σ	11.26
-2σ	7.32
-3σ	3.36

Table 6: 6-Sigma for Court Run

6-Sigma Scale	Scores
3σ	35.69
2σ	31.814
1σ	27.94
Σ	26
-1σ	24.06
-2σ	20.19
-3σ	16.31

Finally from the norms a grading scale was developed to interpret the playing ability of the players which was presented in table-7 to table-10.

Table 7: Grading Scale for the Interpretation of Parallel Drive (Forehand)

Scores	Alphabetical Grades	Interpretive Grade
Above 15.43	A	Excellent
11.68 – 15.43	B	Good
7.92 – 11.68	C	Average
4.17 – 7.92	D	Satisfactory
Below 4.17	E	Poor

Table 8: Grading Scale for the Interpretation of Parallel Drive (Backhand)

Scores	Alphabetical Grades	Interpretive Grade
Above 13.55	A	Excellent
10.69 – 13.55	B	Good
7.69 – 10.69	C	Average
4.83 – 7.69	D	Satisfactory
Below 4.83	E	Poor

Table 9: Grading Scale for the Interpretation of Alternate Parallel Drive

Scores	Alphabetical Grades	Interpretive Grade
Above 19.2	A	Excellent
15.26 – 19.2	B	Good
11.26 – 15.26	C	Average
7.32 – 11.26	D	Satisfactory
Below 7.32	E	Poor

Table 10: Grading Scale for the Interpretation of Court Run

Scores	Alphabetical Grades	Interpretive Grade
Above 31.814	A	Excellent
27.94 – 31.814	B	Good
24.06 – 27.94	C	Average
20.19 – 24.06	D	Satisfactory
Below 20.19	E	Poor

4. Discussion on Findings

The intention of the researcher was to construct a comprehensive module with limited number of test items and greater level of dependability. While analyzing results it was revealed that there was an inter-relationship between the performances of selected test items. The above said tests were found to highly reliable and fully valid final test battery.

Although ordinary one would not confidently conclude that skills other than four items really do not matter in playing ability, it is of statistical interest to say that they do not possess significant influence in the current context. The high validity and reliability scores for the four test items in the final test battery module also affirm the fact that the administrations of these tests have been good, thereby assuring the administration feasibility of the tests.

Final test battery was believed that a significant contribution for the promotion of the game. The battery, when employed by the coaches, is expected to help them to come up with useful and reliable data that may be processed for monitoring and improving the playing ability of the subjects.

5. Conclusions

1. The result reveals that there was an inter-relationship between the performances of selected test items.
2. Four test items were selected to constitute the 'Battery of Squash Skill Test' for the national players in the age ranged between 17 and 20 years.
3. The test were alternate parallel drive from front court, parallel drive from the back court (forehand and backhand), and court run.

4. The playing ability performance score of the players were interpreted by using a grading scale on the basis of 6-sigma scale as A, B, C, D and E or Excellent, Good, Average, Satisfactory and Poor respectively according to their performance score based on the percentiles norm, which was developed for the selected test items.

6. Recommendations

1. The skill test battery developed in this study might be used to evaluate the performance of Squash players of different clubs.
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 undertaken with Squash players of different levels such as District, University, State, National and International.
4. Similar study may be conducted on women Squash players and also for other games.

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