Prediction of Basket Ball Playing Ability through Motor Fitness Variables

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Abstract

Motor fitness variables including speed, coordinative abilities, agility, explosive leg power, shoulder strength, endurance, abdominal muscle strength endurance, spine flexibility have been studied on fifty female basketball players. Basketball Playing ability was evaluated through subjective judgment by panel of three expert during Panjab University inter college basketball competition. Regression equation for playing ability was established and it was that found 9 min run and walk, basketball throw for distance and Sargent jump were found most important predictors in basketball playing ability among female college level players.

Introduction

Sports training are a large laboratory for the preparation of the right psychological condition of an individual. In the world of competition, every effort is being made to train the individuals, so that they give there the best performance in the competitions. The performance of the players of a particular country in international sports competitions, especially in Olympics and World cup is a matter of great pride for their respective countries. According to Renewas (1972) “Performance is a very note of all the sports its basic principles as the sports has become prestigious aspect to prove one’s superiority over others”.

Preponderance of scientific evidence obtained from different investigations has revealed that high level of performance depends upon various factors like physical, physiological, skill, psychological, somatic, genetic, anthropometrics etc. According to Motto (1977) performance depends on inherited characteristics like height, speed and limb length and the establishment of such factors become all the more important. Haag and Singer (1979) are of the opinion that the superb physical fitness and the best training of an individual ultimately help in achieving high performance.

Each game demands a specific kind of motor fitness. In modern basketball trends most of the teams are used to playing higher speed basketball and it’s depends primarily on very good level of motor fitness. Moonstir (1978) expressed that the basketball game demands highly skilled player with the maximum physical conditioning. Today’s basketball players put themselves through vigorous and varied training programme to
meet the fitness demands of the game because without that it has become very difficult to excel in the high level of performance games without errors and turnover.

Various studies in the field of basketball, by Sharma (1989) Sinha (1984) Gorden (1979), Mozumdar Indu and M. Edwin (2000) revealed that motor fitness plays a significant role in basketball performance, even if the team consists of highly skilled, technically sound and experienced players. Keeping in view of motor fitness variables in basketball playing ability the present study was undertaken to predict the playing ability of female basketball players of inter college level through motor fitness variables.

**Methodology**

Fifty female basketball players were randomly selected for the study from the various colleges of Panjab University, Chandigarh who participated in the Panjab University Inter-college basketball competition held at Chandigarh. All the sample subjects were between 18 to 25 years of age.

The basketball playing ability of the female players was determined through subjective rating during the Panjab University Inter college competition in some specific areas namely anticipation and quick decision, tactics and strategies, interaction, skill efficiency, knowledge of rules and games, ability to change tactics when the new situations demand, ability to analyze opponents move and respond accordingly and overall rationale of the game. Rating was done on five-point scale by a panel of three experts. The scores were the average of the three experts rating. The scale is given below:

<table>
<thead>
<tr>
<th>Average</th>
<th>Above Average</th>
<th>Good</th>
<th>Very Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

The motor fitness components were measured through below mentioned test

1. Speed  
   50-yard dash

2. Coordinative abilities  
   SEMO agility test

3. Agility  
   Shuttle run

4. Explosive leg power  
   1. Sargent Jump

   2. Standing broad Jump

5. Shoulder strength  
   Basketball throw for distance

6. Endurance  
   12min. run and walk test

7. Abdominal muscle  
   One-minute sit-ups test
   Strength endurance

8. Spine Flexibility  
   Bridge – up test.

**The statistical Technique used:** Pearson’s Product Moment Coefficient of Correlation, Multiple Correlation and regression equation was established. The level of significance chosen was 0.05.
Result and discussion

The statistical analysis of data pertaining to relationship of various motor fitness variables and basketball playing ability of female players is presented in table-1.

Table – 1

RELATIONSHIP OF MOTOR FITNESS VARIABLES WITH PLAYING ABILITY OF FEMALE BASKETBALL PLAYERS

The relationship between motor fitness variables and playing ability of female basketball players was worked out and presented in table-1

TABLE - 1

Relationship between playing ability and Motor fitness variables of female basketball players

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Motor fitness tests</th>
<th>Playing ability</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>50 yard dash</td>
<td>.760*</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>3</td>
<td>9 minute run and walk</td>
<td>.770*</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>4</td>
<td>Shuttle run</td>
<td>.684*</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>5</td>
<td>SEMO agility</td>
<td>.671*</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>6</td>
<td>Basketball throw for distance</td>
<td>.798*</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>7</td>
<td>Standing broad jump</td>
<td>.579*</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>8</td>
<td>Sargent Jump</td>
<td>.718*</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>9</td>
<td>Sit ups</td>
<td>.551*</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>10</td>
<td>Bridge up</td>
<td>-.250 N.S.</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at .01 level of confidence r > .361 (df=48)

The above table (4.09) showed positive significant relationship of female basketball playing ability with some of the motor fitness variables such as 50 yard dash (r= -.760), 9 min run and walk (r= .770), shuttle run (r= -.684), SEMO agility (r= -.671) basketball throw for distance (r= .798), standing broad jump (r = .579), Sargent Jump (r= .718), sit ups (r= .551) at .01 level of significance because their calculated values are greater than the table value of .361 (at 1% level of significant) with 48 degree of freedom. Whereas, basketball playing ability of female players was not significantly related to Bridge up (r = -. 250). The negative values shown in case of second third and
fourth variables indicate positive relationship as less the time taken better the performance is and vice versa.

It is therefore, evident that distance covered in basketball throw, standing broad jump, Sargent Jump, 9/12 minute run and walk, sit ups, 50 yard dash, shuttle run and SEMO agility were essential components for the performance in female basketball players. Whereas, trunk hyperextension (Bridge up) did not contribute to the basketball playing ability of female players.

**Contribution of motor fitness variables to the basketball playing ability of female players**

The results related to contribution of motor fitness variables towards basketball playing ability of female basketball players have been presented in Table 2.

**TABLE- 2**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Variables</th>
<th>Regression Coefficient</th>
<th>R² value</th>
<th>Contribution towards R²</th>
<th>Level of significance</th>
<th>% contribution towards R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>9/12 min run and walk</td>
<td>0.1361</td>
<td>26.20</td>
<td>.05</td>
<td>34.02%</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Basketball Throw for Distance</td>
<td>.0458</td>
<td>.7702</td>
<td>25.36</td>
<td>.01</td>
<td>32.92%</td>
</tr>
<tr>
<td>8</td>
<td>Sargent Jump</td>
<td>.1855</td>
<td>25.46</td>
<td>.01</td>
<td>33.06%</td>
<td></td>
</tr>
<tr>
<td>(a)</td>
<td>Intercept</td>
<td>−4.4645</td>
<td></td>
<td>.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R² = .7702  
F ratio = 51.39  
Level of significance = .05  
Difference in R² of first and final equation = .7950 − .7702 = .0248  
The equation is as under  
Y = −4.4645 + 0.1361 (x₃) + 0.0458 (x₆) + 0.1855 (x₈)  
Where Y = playing ability  
The best regression equation was derived through deleting one motor fitness variable at a time.

The contribution of all the motor fitness variables in the preliminary multiple regression was found to be 79.50 percent of variance to the playing ability of female basketball players, while the variables included in the final run equation, namely 9/12 min run and
walk, distance covered by Basketball throw and Sargent jump explained as high as 77.02 percent of variance to the playing ability of female basketball players. This showed that six variables other than mentioned above secured very less share to the tune of only 2.48 percent of the variance. This revealed that three variables included in the final run equation were very powerful in predicting the playing ability of female basketball players.

Cardiovascular endurance measured through 9 min run and walk test is one of the major fitness parameter required in the game of basketball. The basketball court is 28x15 meters and the duration of the game is 10-2-15-10-2-10. As this game is fast and exciting, all court players go for offense as well as defense. During play, all the players remain involve in continuous movement and actions with or without the ball throughout the length of the game. Most of the time intensity of movement action, and running is very high for both offense and defense; it is possible only if the players posses higher levels of muscular and cardio-vascular endurance. The result of the present study are supported by Scheafsma (1966) said that Cardio-vascular endurance was one of the major physical fitness component required for the game of basketball. Indu Mazumdar and M Edwin (2000) found significant relationship between endurance and basketball playing ability of youth basketball group. In other words, players with cardio-vascular fitness were better performer and vice-versa.

The importance of Basketball throw for distance as indicated by the regression analysis could also be attributed to its frequent use during long passes for fast break attacks, breaking the press in offense and long range shooting specially three pointers shoots by the players. Basketball throws measures the power of arm and shoulder of the players, which was significant at .01 of level with playing ability. According to the prevailing situation player give long passes to their wingers for fast break attack. Players also make the wall of their arms and use continuous arm movement in waving fashion to defend the opponent from shooting and passing easily, which also requires the strength of the arms and shoulders.

Sargent Jump provides power of the legs. Leg power is necessitated in the game of basketball during the performance of the repeated jumps, landing, hopping, jumping, shooting, rebounding and also it forms basis for quick starts and stop etc. The players are bound to develop the leg strength, because legs power substantially contribute to the overall efficiency in the game of basketball. The importance of Leg power was explained by Jagger (1971) one of the authors in basketball literature, that running, jumping, stopping and pivoting imposed a considerable amount of strain on legs and foots muscle and therefore, increasing leg strength programme is most essential in basketball training.

Implication of the study:

Basketball is one of the sports which required high level of motor fitness. Only physically fit player can perform motor skill with great speed and accuracy during highly competitive games. So players coaches, trainers and physical education teachers must concentrate on the development of motor fitness variables.

REFERENCES


