

ISSN: 2501 - 1235 ISSN-L: 2501 - 1235 Available on-line at: <u>www.oapub.org/edu</u>

doi: 10.5281/zenodo.1156480

Volume 4 | Issue 1 | 2018

NORMS CONSTRUCTION FOR MUSCULAR STRENGTH, MUSCULAR POWER AND MUSCULAR ENDURANCE OF BASKETBALL PLAYERS OF GURU NANAK DEV UNIVERSITY, AMRITSAR, PUBJAB, INDIA

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Abstract:

The aim of this study was to construct norms for Muscular Strength, Muscular Power and Muscular Endurance of male Basketball Players. Seventy Two, male Basketball Players of Guru Nanak Dev University, Amritsar between the age group of 19-25 years (Mean \pm SD: Age 22.263 \pm 1.332 years, Body Height 180.75 \pm 6.008 centimeters and Body Mass 77.526 ± 5.960 kilograms) volunteered to participate in the study. Statistical analyses were performed using the Statistical Package for the Social Sciences for Windows version 16.0 software (SPSS Inc., Chicago, IL). The data, which was collected by administering tests, was statistically treated to develop for all the test items. In order to construct the norms, Percentile Scale was used. Further, the scores were classified into five grades i.e., very good, good, average, poor and very poor. In Muscular Strength, the scores below 43.296 are considered very poor, from about 45.995-43.296 is considered poor, 45.995-51.393 is considered average, 51.393-54.092 is considered good and the scores above 54.092 are considered very good. In Muscular Power, the scores below 41.913 are considered very poor, from about 43.991-41.913 is considered poor, 43.991-48.147 is considered average, 48.147-50.225 is considered good and the scores above 50.225 are considered very good. In Muscular Endurance, the scores below 4.39 are considered very poor, from about 5.438-4.39 is considered poor, 5.438-7.534 is considered average, 7.534-8.582 is considered good and the scores above 8.582 are considered very good.

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Key words: norms, basketball players, muscular strength, muscular power and muscular endurance

1. Introduction

Basketball has been described as an intermittent sport, being physically very demanding, requiring players to frequently repeat bouts of intense actions (sprinting, shuffling, jumping) with jogging, walking or short periods of recovery (Ben Abdelkrim, El Fazaa, & El Ati, 2006; McInnes, Carlson, Jones, & McKenna, 1995).

Consequently, in order to play successfully, basketball players must be physically well prepared by having optimally developed levels of explosive power, agility, anaerobic power and anaerobic capacities (Apostolidis, Nassis, Bolatoglou, & Geladas, 2004; Ben Abdelkrim, Chaouachi, Chamari, Chtara, & Castagna, 2010; Delextrat & Cohen, 2008; Hoffman, Tenenbaum, Maresh, & Kraemer, 1996).

There have been many studies in team sports linking fitness and/or anthropometric test scores to playing level and success in sports such as American football, (Fry A, & Kraemer W, 1991; Black W, & Roundy E, 1994) soccer, (Abrantes C, Ma, c as V, Sampaio J, 2004) rugby union, (Quarrie KL, Handcock P, Waller AE, 1995) Australian rules football, (Young WB, Pryor L, 2007) field hockey, (Keogh JW, Weber CL, Dalton CT, 2003) volleyball (Gualdi-Russo E, Zaccagni L., 2001) and basketball (Drinkwater EJ, Hopkins WG, McKenna MJ, 2007; Hoare DG, 2000).

2. Material and Methods

2.1 Selection of Subjects

Seventy Two, male Basketball Players of Guru Nanak Dev University, Amritsar between the age group of 19-25 years (Mean \pm SD: Age 22.263 \pm 1.332 years, Body Height 180.75 \pm 6.008 centimeters and Body Mass 77.526 \pm 5.960 kilograms) volunteered to participate in the study. The subject details are presented in Table 1 and exhibited in Figure 1.

Sr. No.	College	Sample (N=72)
1.	D.A.V., College, Amritsar	12
2.	Khalsa, College, Amritsar	12
3.	G.N.D. University, Campus, Amritsar	12
4.	D.A.V., College, Jalandhar	12
5.	Lyallpur Khalsa College, Jalandhar	12
6.	SSM College Dinanagar, Gurdaspur	12

Table 1: Details of subjects	
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Figure 1: Details of subject

Table 2: Subject's demographics of male Basketball Players	of
Curu Nanak Doy University Amritear (N=72)	

Variables	Samula		Khalea		DAV	Luallour	CSM
vallables	Sample	D.A. V.,	Kildisa,	G.N.D.	D.A. V.,	Lyanpur	55IVI
	Size	College,	College,	University,	College,	Khalsa	College
	(N=72)	Amritsar	Amritsar	Campus,	Jalandhar	College,	Dinanagar,
		(N ₁ =12)	(N 2 =12)	Amritsar	(N ₄ =12)	Jalandhar	Gurdaspur
				(N ₃ =12)		(N ₅ =12)	(N ₆ =12)
Age	22.263	22.583	22.416	22.166	21.666	22.25	22.5
(years)	±	±	±	±	±	±	±
	1.332	1.240	1.378	1.466	1.669	1.138	1.087
Body Height	180.75	180	181.33	179.83	181.166	181.25	180.91
(centimeters)	±	±	±	±	±	±	±
	6.008	6.564	5.959	6.235	6.548	5.863	5.991
Body Mass	77.526	77.066	77.35	76.125	78.741	77.991	77.883
(kilograms)	±	±	±	±	±	±	±
	5.960	6.463	5.843	5.526	6.626	6.159	6.050



Figure 2: Subject's demographics of male Basketball Players of Guru Nanak Dev University, Amritsar (N=72)

2.2 Selection of Variables

The following Physical Fitness Test Items were selected for the present study:

Sr. No.	Variables	Test
1.	Muscular Strength	Handgrip Strength Test
2.	Muscular Power	Vertical Jump Test
3.	Muscular Endurance	Pull-Up Test

3. Statistical Analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences for Windows version 16.0 software (SPSS Inc., Chicago, IL). The data, which was collected by administering tests, was statistically treated to develop for all the test items. In order to construct the norms, Percentile Scale was used. Further, the scores were classified into five grades i.e., very good, good, average, poor and very poor.

4. Results

For each of the chosen variable, the result pertaining to Descriptive Statistics (Mean and SD) and Percentile Plot (Hi and Low) of Physical Fitness Test Items of Basketball Players of Guru Nanak Dev University, Amritsar are presented in the following tables:

	Basketball Players of Guru Nanak Dev University, Amritsar (N=72)				
Sr. No.	Test Items	Mean		Hi	Low
		±			
		SD			
1.	Muscular Strength	Mean	48.694	55.00	42.00
		SD	2.699		
2.	Muscular Power	Mean	46.069	40.00	49.00
		S.D	2.078		
3.	Muscular Endurance	Mean	6.486	8.000	4.000
		SD	1.048		

Table 3: Descriptive Statistics (Mean and SD) and Percentile Plot (Hi and Low) of male Basketball Players of Guru Nanak Dev University, Amritsar (N=72)

In Muscular Strength, the mean score was 48.694 and standard deviation score was 2.699. In Muscular Power the mean score was 46.069 and standard deviation score was 2.078. Whereas in Muscular Endurance, the mean score was 6.486 and standard deviation score was 1.048.



Figure 3: Descriptive Statistics (Mean and SD) of selected Physical Fitness Test Items (i.e., a. Muscular Strength, b. Muscular Power and c. Muscular Endurance of male basketball players of Guru Nanak Dev University, Amritsar (N=72)

4.1 Grades under Normal Distribution

Five types of classification/grades i.e., Very Poor, Poor, Average, Good and Very Good have also been prepared under Normal Distribution. Grades have been presented in Table 4.

Guru Nanak Dev University, Amritsar (N=72)							
Test Items	Very Poor	Poor	Average	Good	Very Good		
Muscular	Less than (<)	45.995-	45.995-	51.393-	Greater than		
Strength	43.296	43.296	51.393	54.092	(>)54.092		
Muscular	Less than (<)	43.991-	43.991-	48.147-	Greater than		
Power	41.913	41.913	48.147	50.225	(>)50.225		
Muscular	Less than (<)	5.438-	5.438-	7.534-	Greater than		
Endurance	4.39	4.39	7.534	8.582	(>)8.582		

Table 4: Grading of selected Physical Fitness Test Items (i.e., a. Muscular Strength, b. Muscular Power and c. Muscular Endurance of male Basketball Players of Guru Nanak Dev University, Amritsar (N=72)

4.2 Muscular Strength

• In Muscular Strength, the scores below 43.296 are considered very poor, from about 45.995-43.296 is considered poor, 45.995-51.393 is considered average, 51.393-54.092 is considered good and the scores above 54.092 are considered very good

4.3 Muscular Power

• In Muscular Power, the scores below 41.913 are considered very poor, from about 43.991-41.913 is considered poor, 43.991-48.147 is considered average, 48.147-50.225 is considered good and the scores above 50.225 are considered very good.

4.4 Muscular Endurance

• In Muscular Endurance, the scores below 4.39 are considered very poor, from about 5.438-4.39 is considered poor, 5.438-7.534 is considered average, 7.534-8.582 is considered good and the scores above 8.582 are considered very good.



(a)

Baljinder Singh Bal, Gurpinder Singh, Bhupinder Singh, Lovepreet Singh NORMS CONSTRUCTION FOR MUSCULAR STRENGTH, MUSCULAR POWER AND MUSCULAR ENDURANCE OF BASKETBALL PLAYERS OF GURU NANAK DEV UNIVERSITY, AMRITSAR, PUNJAB, INDIA



(c)



5. Conclusions

According to the results, we can conclude that the in Muscular Strength, the scores below 43.296 are considered very poor, and the scores above 54.092 are considered very good. In Muscular Power, the scores below 41.913 are considered very poor, and the scores above 50.225 are considered very good. In Muscular Endurance, the scores below 4.39 are considered very poor, and the scores above 8.582 are considered very good.

In practice, the results can be very useful for the physical education teachers, trainers and coaches of Basketball players to estimate the performance of their players/trainees and to improve the instructional programmes and training module accordingly.

Furthermore, this study may provide appropriate percentile norms of specific physical fitness items of male Basketball players and may offer distribution of grades under normal distribution.

Acknowledgements

A special acknowledgement of appreciation for this work in preparing the original manuscript is due to assistance from male Basketball players of Guru Nanak Dev University, Amritsar. The authors would like to thank the players and coaches from six basketball teams (D.A.V., College, Amritsar, Khalsa, College, Amritsar, G.N.D. University, Campus, Amritsar, D.A.V., College, Jalandhar, Lyallpur Khalsa College, Jalandhar and SSM College Dinanagar, Gurdaspur) for their participation in the study.

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