



NORMATIVE SCALES FOR STUDENTS OF PHYSICAL EDUCATION

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Abstract

The intention of the study was to prepare normative scales for evaluating the performance of physical education students, in jumping events (athletics). A sample of 1400 student was taken from different physical education colleges and department of universities of Punjab and Chandigarh. Subjects were divided in two groups according to their chronological age i.e. 18 to 21 year and 21 to 25 year boys and girls, in each age group 700 students 400 boys and 300 girl students of physical education served as subjects. The performance of subjects in jumping events collected through three test items namely high jump, long jump, and triple jump. Norms were prepared for jumping events (athletics) with four normative scales such as percentile, Hull, sigma and T scale and standard for evaluation of students also established under Normal Distribution.

1. Introduction

In physical education, evaluation plays a vital role since beginning. The phase of physical education and sports process is concerned with test, measurement and evaluation. These involve techniques to measure student's status and progress in growth, development and achievement. The results of such application indicate not only changes in the product in these areas, but also the magnitude of such changes as well as the direction they have taken.

“Norms are the values considered to be the representative of a specified population. A test that has accompanying norms is definitely preferred to one that is usually based on age, weight, grade, height or various combination of these characteristics” (Johnson et al.1988).

There are several types of norms, such as Percentile norms, standard norms, T-score norms, age norms and grade norms. These norms are most popular and widely used in physical education and sports. As we know that physical education is as old as beginning of human culture. In pre-historical period physical activities had done for the recreational purpose and with the change of time it becomes famous in competitive way. With the development of human being sports activities

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have also been changed and many of new activities have come in the new trends of physical education and sports. History reveals that as human become more civilized, scientific and subsequently sought more exact way to measure the general as well as specific evaluation. The history of measurement and evaluation in physical education and sports has paralleled the growth and development of research which has elevated the field to a more respected position in the educational spectrum. Today, measurement of skills and knowledge of fitness testing are also deemed a necessary part of professional preparation, of physical education teacher and coaches. Today every state has number of Professional colleges and department of Physical Education in various universities. In these colleges and departments, various courses of physical education are running such as Diploma in physical education (DP.Ed) 2 year course, Bachelor of physical education (B.P.E) 4 year course, both are after 10+2, Bachelor in physical education (BP.Ed) one year course, after graduation and Master of physical education (M.P.Ed) 2 year course after (BP.Ed). In these courses various theory and practical subjects are being taught. Practical aspects of curriculum include various aspects of game and athletics.

Training of teaching for practical courses of physical education and sports such as games and athletics is given by teachers of Professional colleges and universities. Athletics is a major practical course of physical education curriculum, because activities like running, jumping and throwing takes place only in athletics.

Till time all these events are evaluated by only observational technique, which is not a valid test/tool of measurement because it always shows partial and imperfect/biased opinions and teachers are bound to respond to a false impression of teaching and training effects. Teachings of theoretical subjects are evaluated by taking paper pencil test. As curriculum of Physical Education contains both theory and practical aspects, effective teaching in Physical Education and sports shall depend largely upon the ability of teacher/coach to test and evaluate the students with the help of standardized athletic tests and norms.

Research scholar feels that if athletic performance norms are made available to teachers/coaches, students and athletes they will definitely improve their performance because they will compare their current performance score with their previous score. It can be a motivational factor to develop the area of sports performance and Physical Education teaching. With the standardized performance norms availability, partial evaluation can be minimized. On the other hand the job of the teacher will be made easier and reliable on the basis of performance norms, which will help to evaluate the students of physical education (Teaching). In Physical Education, practical teaching plays an important role as it is an integral part of this education system. In every curriculum of physical education programs, practical teaching has equal weightage to theory courses/subjects at elementary and high school level more emphases are given on practical teaching. Therefore objectivity in evaluation is highly required it can be achieve through if Teachers of physical education should prepare and evaluate perfectly with a valid test and ideal norms. If teachers have more practical knowledge then development of the nation should be in

positive manner and well practitioner teachers can produce in physical education profession. Following objectives were formulated for the present study:

- 1) To Construct Athletic Performance norms for students of Physical Education in Punjab and Chandigarh.
- 2) To construct Athletic Performance norms for Physical Education students of different age groups such as 18-21 and 21-25 years.

2. Method

A Sample of 1400 Subjects, 400 boys and 300 girls between 18 to 21 year and 400 boys and 300 girls between 21 to 25 year age were selected. These Subjects were students of different physical education colleges and department of universities. The performance data of students was taken by administering three test items namely high jump, long jump, and triple jump. The collected data analysed with SPSS 16.0 and Microsoft excels to construct norms for test items. Four normative scales such as percentile, Hull, sigma and T scales were constructed. For grading of students five standards i.e. Excellent, Good, Average, Fair and Poor were also established under Normal Distribution.

3. Results and Discussions

The data were analysed and the findings were presented in two different phases. The first phase deals with percentile scale and evaluation standards of physical education students and second phase deals with the T-scale, hull scale, and sigma scale.

PHASE-I PERCENTILE NORMS AND STANDARD OF EVALUATION

Percentile scales for the students of physical education with age range from 18-21 and 21-25 years have been presented as following:

Table 1 *Percentile norms of long jump (in mtr.)*

PERCENTILE	Age Group 18-21 Years		Age Group 21-25 Years	
	Boys	Girls	Boys	Girls
95 th	5.73	4.27	6.49	4.85
90 th	5.47	3.91	6.25	4.31
85 th	5.32	3.75	6.14	4.11
80 th	5.12	3.60	5.92	3.84
75 th	4.87	3.44	5.62	3.70
70 th	4.67	3.27	5.46	3.64
65 th	4.59	3.25	5.35	3.54
60 th	4.50	3.22	5.29	3.45
55 th	4.39	3.18	5.23	3.29
50 th	4.33	3.13	5.19	3.26
45 th	4.26	3.08	5.14	3.19
40 th	4.13	2.97	5.01	3.16

35 th	3.82	2.78	4.89	3.11
30 th	3.64	2.71	4.78	3.00
25 th	3.55	2.60	4.69	2.88
20 th	3.33	2.50	4.47	2.76
15 th	3.24	2.39	4.28	2.66
10 th	3.12	2.34	4.12	2.55
5 th	2.74	2.17	3.69	2.38

Table 2 Percentile norms of triple jump (in mtr.)

PERCENTILE	Age Group 18-21 Years		Age Group 21-25 Years	
	Boys	Girls	Boys	Girls
95 th	11.33	7.43	11.41	9.24
90 th	10.32	7.22	10.85	8.47
85 th	9.46	7.11	10.35	8.21
80 th	9.23	6.86	9.78	7.63
75 th	8.57	6.67	9.58	7.25
70 th	8.42	6.55	9.46	7.13
65 th	8.24	6.47	9.34	6.77
60 th	7.84	6.40	9.25	6.58
55 th	7.58	6.32	9.21	6.49
50 th	7.48	6.19	9.14	6.33
45 th	7.35	6.05	8.75	6.31
40 th	7.21	5.80	8.49	6.28
35 th	6.84	5.67	8.30	6.19
30 th	6.63	5.47	8.19	5.71
25 th	6.47	5.38	8.14	5.47
20 th	6.29	5.34	7.37	5.27
15 th	5.96	5.23	6.99	5.14
10 th	5.67	4.81	6.37	4.32
5 th	5.35	4.27	5.98	4.16

Table 3 Percentile norms of high jump (in mtr.)

PERCENTILE	Age Group 18-21 Years		Age Group 21-25 Years	
	Boys	Girls	Boys	Girls
95 th	1.56	1.25	1.57	1.45
90 th	1.45	1.23	1.55	1.20
85 th	1.43	1.22	1.52	1.18
80 th	1.41	1.21	1.48	1.16
75 th	1.36	1.21	1.44	1.16
70 th	1.34	1.20	1.38	1.14
65 th	1.32	1.20	1.38	1.14
60 th	1.31	1.20	1.35	1.14
55 th	1.28	1.19	1.35	1.12

50 th	1.27	1.18	1.32	1.12
45 th	1.25	1.14	1.32	1.10
40 th	1.24	1.12	1.31	1.08
35 th	1.23	1.11	1.30	1.06
30 th	1.23	1.08	1.30	1.06
25 th	1.22	1.08	1.28	1.05
20 th	1.20	.98	1.25	1.04
15 th	1.17	.98	1.25	1.02
10 th	1.14	.98	1.23	1.02
5 th	1.12	.87	1.21	.98

Table-3 shows that the maximum scores of jumping events are at 95th percentile and the minimum scores are at 5th percentile for age group 18 to 21 year boys, girls and 21 to 25 boys, girls. The highest scores are at the top and the lowest scores are at the bottom of the table.

In the following tables the standards of evaluation are presented from table- 4 to table- 6 for evaluation of students. Standards of evaluation were based mean and Standard deviation values.

Table 4 Evaluation standards for long jump (in mtr.)

STANDARDS	SCORE LIMIT FOR 18-21 AGE GROUP		SCORE LIMIT FOR 21-25 AGE GROUP	
	BOYS	GIRLS	BOYS	GIRLS
Excellent	Above 5.93	Above 4.20	Above 6.68	Above 4.61
Good	4.82 - 5.92	4.19 - 3.46	5.66 – 6.68	3.78 – 4.60
Average	3.71 - 4.81	3.45 – 2.72	4.63 – 5.65	2.96 – 3.77
Fair	2.60 - 3.70	2.71- 2.00	3.60- 4.62	2.14- 2.95
Poor	Below 2.60	Below 2.00	Below 3.59	Below 2.13

Table 5 Evaluation standards for triple jump (in mtr.)

STANDARDS	SCORE LIMIT FOR 18-21 AGE GROUP		SCORE LIMIT FOR 21-25 AGE GROUP	
	BOYS	GIRLS	BOYS	GIRLS
Excellent	Above 10.50	Above 7.72	Above 11.65	Above 9.03
Good	8.50 – 10.49	7.71 – 6.62	9.73 – 11.64	7.29 – 9.02
Average	6.50 – 8.49	6.61 – 5.51	7.80 – 9.73	5.55 - 7.30
Fair	4.50 – 6.49	5.51- 4.41	5.88 - 7.80	3.82 - 5.56
Poor	Below 4.49	Below 4.40	Below 5.88	Below 3.82

Table 6 Evaluation standards for high jump (in mtr.)

STANDARDS	SCORE LIMIT FOR 18-21 AGE GROUP		SCORE LIMIT FOR 21-25 AGE GROUP	
	BOYS	GIRLS	BOYS	GIRLS
Excellent	1.52 & Above	1.32 & Above	1.56 & Above	1.29 & Above
Good	1.36 - 1.51	1.19 - 1.31	1.42 - 1.55	1.28 - 1.17
Average	1.21 - 1.35	1.06 - 1.18	1.29 - 1.41	1.16 - 1.05
Fair	1.07 - 1.20	.94 - 1.05	1.15 - 1.28	1.04 - .93
Poor	Below 1.06	Below 93	Below 1.15	Below .93

PHASE – II

In this section T scale, Hull scale, and Sigma scale were constructed. It is considered as standard scale because it is based on mean and standard deviation values. These scales for the students of physical education with age ranging from 18-21 and 21-25 years have been presented as follow:

Table 7 Norms of long jump for 18 – 21 year age group (In cm.)

BOYS				GIRLS		
T-SCALE	HULL SCALE	SIGMA SCALE	PERCENTILE	T-SCALE	HULL SCALE	SIGMA SCALE
-34.88	103.42	149.52	0	2.82	94.7	125.32
57.32	167.96	204.84	10 th	64.07	137.57	162.07
149.52	232.5	260.16	20 th	125.32	180.45	198.82
241.72	297.04	315.48	30 th	186.57	223.32	235.57
333.92	361.58	370.8	40 th	247.82	266.2	272.32
426.12	426.12	426.12	50 th	309.07	309.07	309.07
518.32	490.66	481.44	60 th	370.32	351.95	345.82
610.52	555.2	536.76	70 th	431.57	394.82	382.57
702.72	619.74	592.08	80 th	492.82	437.7	419.32
794.92	684.28	647.4	90 th	554.07	480.57	456.07
887.12	748.82	702.72	100 th	615.32	523.45	492.82

Table 8 Norms of triple jump for age group 18 – 21 (in cm.)

BOYS				GIRLS		
T-SCALE	HULL SCALE	SIGMA SCALE	PERCENTILE	T-SCALE	HULL SCALE	SIGMA SCALE
-93.04	167.02	253.7	0	147	284.94	330.92
80.33	288.37	357.72	10 th	238.96	349.31	386.1
253.7	409.73	461.74	20 th	330.92	413.68	441.27
427.07	531.09	565.77	30 th	422.88	478.06	496.45
600.44	652.45	669.79	40 th	514.84	542.43	551.62

773.81	773.81	773.81	50 th	606.8	606.8	606.8
947.18	895.17	877.83	60 th	698.76	671.17	661.98
1120.55	1016.53	981.85	70 th	790.72	735.54	717.15
1293.92	1137.89	1085.88	80 th	882.68	799.92	772.33
1467.29	1259.25	1189.9	90 th	974.64	864.29	827.5
1640.66	1380.6	1293.92	100 th	1066.6	928.66	882.68

Table 9 Norms of high jump for age group 18 – 21 (in cm.)

BOYS				GIRLS		
T-SCALE	HULL SCALE	SIGMA SCALE	PERCENTILE	T-SCALE	HULL SCALE	SIGMA SCALE
67.08	85.76	91.98	0	58.91	75.08	80.47
79.53	94.47	99.45	10 th	69.69	82.63	86.94
91.98	103.19	106.92	20 th	80.47	90.17	93.41
104.43	111.9	114.39	30 th	91.25	97.72	99.87
116.88	120.62	121.86	40 th	102.03	105.26	106.34
129.33	129.33	129.33	50 th	112.81	112.81	112.81
141.78	138.04	136.8	60 th	123.59	120.36	119.28
154.23	146.76	144.27	70 th	134.37	127.9	125.75
166.68	155.48	151.74	80 th	145.15	135.45	132.21
179.13	164.19	159.21	90 th	155.93	142.99	138.68
191.58	172.9	166.68	100 th	166.71	150.54	145.15

Table-7 to 9 shows the highest scores of jumping events are at 100th percentile and the lowest scores are at Zero percentile for age group of 18 to 21 year boys. The highest scores are at bottom of table and the lowest scores are at the top of table.

Table 10 Norms of long jump for age group 21-25 (in cm.)

BOYS				GIRLS		
T-SCALE	HULL SCALE	SIGMA SCALE	PERCENTILE	T-SCALE	HULL SCALE	SIGMA SCALE
86.95	215.27	258.05	0	- 6.08	96.83	131.14
172.5	275.16	309.38	10 th	62.53	144.86	172.31
258.05	335.05	360.71	20 th	131.14	192.89	213.47
343.6	394.93	412.04	30 th	199.75	240.92	254.64
429.15	454.82	463.37	40 th	268.36	288.94	295.8
514.7	514.7	514.7	50 th	336.97	336.97	336.97
600.25	574.59	566.03	60 th	405.58	385	378.14
685.8	634.47	617.36	70 th	474.19	433.02	419.3
771.35	694.35	668.69	80 th	542.8	481.05	460.47
856.9	754.24	720.02	90 th	611.41	529.08	501.63
942.45	814.13	771.35	100 th	680.02	577.1	542.8

Table 11 Norms of triple jump for age group 21-25 (in cm.)

BOYS				GIRLS		
T-SCALE	HULL SCALE	SIGMA SCALE	PERCENTILE	T-SCALE	HULL SCALE	SIGMA SCALE
75.37	315.91	396.09	0	- 80.74	136.31	208.66
235.73	428.16	492.31	10 th	63.96	237.6	295.48
396.09	540.41	588.52	20 th	208.66	338.89	382.3
556.45	652.67	684.74	30 th	353.36	440.18	469.12
716.81	764.92	780.95	40 th	498.06	541.47	555.94
877.17	877.17	877.17	50 th	642.76	642.76	642.76
1037.53	989.42	973.39	60 th	787.46	744.05	729.58
1197.89	1101.67	1069.6	70 th	932.16	845.34	816.4
1358.25	1213.93	1165.82	80 th	1076.86	946.63	903.22
1518.61	1326.18	1262.03	90 th	1221.56	1047.92	990.04
1678.97	1438.43	1358.25	100 th	1366.26	1149.21	1076.86

Table 12 Norms of high jump for age group 21-25 (in cm.)

BOYS				GIRLS		
T-SCALE	HULL SCALE	SIGMA SCALE	PERCENTILE	T-SCALE	HULL SCALE	SIGMA SCALE
80.01	96.84	102.45	0	60.35	75.67	80.77
91.23	104.69	109.18	10 th	70.56	82.81	86.9
102.45	112.55	115.91	20 th	80.77	89.96	93.02
113.67	120.4	122.65	30 th	90.98	97.11	99.15
124.89	128.26	129.38	40 th	101.19	104.25	105.27
136.11	136.11	136.11	50 th	111.4	111.4	111.4
147.33	143.96	142.84	60 th	121.61	118.55	117.53
158.55	151.82	149.57	70 th	131.82	125.69	123.65
169.77	159.67	156.31	80 th	142.03	132.84	129.78
180.99	167.53	163.04	90 th	152.24	139.99	135.9
192.21	175.38	169.77	100 th	162.45	147.13	142.03

Table-10 to 12 shows the highest scores of jumping events are at 100th percentile and the lowest scores are at Zero percentile for age group of 21 to 25 year girls. The highest scores are at bottom of table and the lowest scores are at the top of table.

4. Conclusions

Four normative scales namely Percentile, Hull, Sigma and T-scale were constructed for students of physical education colleges and universities of Punjab (State) and Chandigarh (U.T.). The differences in the performance of boys' students belonging to two age groups i.e. 18-21 and 21-25 years in long triple and high jumps were found. The mean scores in long jump, triple jump and high jump of the subjects of two groups have been found to be 426.12, 773.81, 129.32 and 514.70, 877.17 and 136.11 respectively. It

indicates that there is a significant difference in the performance of the students in long jump, triple jump and high jump of the above said two groups. The results reveal that the subjects of 21-25 years of age group performed better in long, triple and high jumps as compared to the boys subjects of 18-21 years of age. The difference in the performance of male subjects in the field events might be due to the influence of the factors such as age, diet, experience, physical and psychological maturity and fitness of subjects. This may be due to the above said facts.

The differences in the performance of girls students belonging to two age groups i.e. 18-21 and 21-25 years in long, triple and high jumps. The mean scores in long jump, triple jump and high jump of the subjects of two groups have been found to be 309.07, 606.80, 112.81 and 336.97, 642.76 and 111.40 respectively. It indicates that there is a significant difference in the performance of long jump and triple jump but in-significant difference in high jump of the above said two groups. The result shows the subjects of 21-25 years of age group performed better in long and triple jumps as compared to the subjects of 18-21 years of age and in high jump event the subjects of 18-21 years of age group performed better in high jump as compared to the subjects of 21-25 years of age. The difference in performance of girls' subjects in the field events may be influenced by a number of factors such as age, diet, experience, physical and psychological maturity and fitness of subjects. This may be due to the above said facts.

Present study will be helpful as following:

- 1) Providing criteria to teachers of physical education for objective evaluation.
- 2) Helping the coaches and physical education teachers to know the effects of their training, teaching and coaching on athlete's performance.
- 3) Helping physical education teachers and coaches to grade the students.
- 4) Helping students to compare their current performance with previous performance in athletic.
- 5) Providing norms which will be helpful to Physical Education students, teachers and coaches for the evaluation, classification and selection of students for different levels of competition.
- 6) Providing scientifically constructed athletic performance norms to students of physical education.
- 7) Enabling students to evaluate self-performance in athletic.

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