

Construction of Physical Fitness Norms for Six to Eight Grade Boys of Mumbai City

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Abstract: The objective of the study is to construct Physical Fitness Norms for school group children. A total sample of 598 students were determined for the study by using cluster and simple random method of sampling from six, seven and eight grade male students studying in the schools of Mumbai city. The study variables were Speed, Agility, Abdominal Strength, Shoulder Strength, Explosive strength and cardiovascular endurance. The data was collected by using the AAPHERD standard test of selected physical fitness variables. The data were observed for their normality through descriptive statistics and further analyses through a percentile scale. The constructed norms are ranging from 0 to 100, which was further converted into a 5 grade scale and for Pull-Ups a 3 grade scale.

Keywords: Norms, Physical Fitness Variables, AAPHERD TEST

I Introduction

According to the WHO 'Health is a dynamic state of complete physical, mental, spiritual, and social well-being and not merely the absence of disease or infirmity' (WHO, 2011). To optimize the functional performance of these dimensions, one must follow physical fitness, mental practices, emotional balance and socio-environmental hygiene. 'Health is Wealth', is one of the most popular quotes, it makes us realize the value of health in our life, which can be achieved by healthy lifestyle practices, such as regular physical activity, optimal nutrition, adequate sleep and so on.

Physical Fitness is the key to good health. According to Clarke (1971) "Physical fitness is the ability to carry out daily tasks with vigour and alertness without undue fatigue and ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies". Most of the time people have a casual approach towards their health, until they do not suffer from any disease or health emergency. Fitness can be considered as a preventive measure, to protect the person from unforeseen health challenges. It improves quality and span of life, and so it is also said 'Exercise is a medicine' because it cures injuries through rehabilitation programs as well as reverses moderate levels of type 2 diabetes, obesity, hypertension and metabolic syndrome.

As per WHO, database, in 2016, more than 1.9 billion adults (18 and above age) were overweight and 650 million were obese. Data from age group 5-19, shows that 340 million children were overweight or obese in 2016. Obesity is an epidemic chronic disease, as well as it is the leading cause of death worldwide (WHO,2020). Diabetes is also one of the leading direct cause of premature death. It is also a major cause of blindness, kidney failure, heart attack, stroke and so on.

Globally, 23% of adults and 81% of school-going adolescents are not active enough. A sedentary lifestyle or physically inactive routine pushes the person towards such unaffordable challenges. But all of this can be prevented by adopting healthy lifestyle practices. Children's health is also a challenge in present scenario. To monitor their health status, it is very important to adopt a sustainable approach. With this intention the present study developed physical fitness norms for school going children to find out their health and fitness status in the current population. The study outcome will help to design integrated health and fitness programs to uplift the standard of health of school-going children.

Research Objectives

- To develop Selected Physical Fitness norms for boys of grade six, seven and eight
- To observe the physical fitness of the students according to their age, based on developed norms.

II. Methodology

The study adopted a normative survey method to develop physical fitness norms for six, seven and eight grade boys of Mumbai city. A total 598 boys were determined as a sample of the study through the cluster and systematic sampling procedure, from 40 schools of 13 zones of Mumbai. The norms were developed for Muscular Strength, Muscular Endurance, Speed, Agility Explosive Strength and Cardio-vascular Endurance variables. The AAHPERD Physical Fitness test was applied to collect data.

Findings

To prepare norms, data were analysed by using descriptive statistics and percentiles. The interpretation of data is as follows,

Table 1: Descriptive Data of Grade 6 Boys

		Grade 6 Boys					
		Standing Broad Jump (cm)	Shuttle Run (sec)	50 Yards Dash (sec)	Pull-Ups (No)	Bent Knee Sit Ups (No)	600 Yards Run/Walk (sec)
N	Valid	180	180	180	180	180	180
	Missing	0	0	0	0	0	0
Mean		136.12	11.89	9.36	1.49	11.96	206.14
Median		134.11	11.77	9.21	1.00	12.50	198.28
Mode		124.97	10.88 ^b	8.41	0.00	13.00	184.49
Std. Deviation		29.04	1.16	1.06	1.89	6.35	38.91
Variance		843.27	1.35	1.13	3.58	40.28	1513.99

Skewness	0.07	0.84	0.41	1.76	-0.07	0.30
Std. Error of Skewness	0.18	0.18	0.18	0.18	0.18	0.18
Kurtosis	-0.31	2.24	-0.46	3.36	-0.61	-0.66
Std. Error of Kurtosis	0.36	0.36	0.36	0.36	0.36	0.36
Range	140.21	7.96	4.72	10.00	28.00	166.70
Minimum	64.01	9.61	7.33	0.00	0.00	133.43
Maximum	204.22	17.57	12.05	10.00	28.00	300.13

Table 2: Descriptive Data of Grade 7 Boys

Grade 7 Boys							
		Standing Broad Jump (cm)	Shuttle Run (sec)	50 Yards Dash (sec)	Pull-Ups (No)	Bent Knee Sit Ups (No)	600 Yards Run/Walk (sec)
N	Valid	192	192	192	192	192	192
	Missing	0	0	0	0	0	0
Mean		149.64	11.61	9.04	1.83	14.21	200.71
Median		149.35	11.58	8.92	1.00	14.00	194.13
Mode		124.97	11.13	8.03 ^b	0.00	12.00	141.86
Std. Deviation		26.43	0.93	1.16	2.49	6.97	37.72
Variance		698.42	0.87	1.34	6.18	48.56	1423.12
Skewness		0.02	0.39	0.69	1.76	0.34	0.66
Std. Error of Skewness		0.18	0.18	0.18	0.18	0.18	0.18
Kurtosis		-0.08	0.01	0.69	2.88	0.10	0.53
Std. Error of Kurtosis		0.35	0.35	0.35	0.35	0.35	0.35
Range		142.95	4.94	6.60	12.00	32.00	197.16
Minimum		64.31	9.51	6.79	0.00	0.00	130.13
Maximum		207.26	14.45	13.39	12.00	32.00	327.29

Table 3: Descriptive Data of Grade 8 Boys

Grade 8 Boys							
		Standing Broad Jump (cm)	Shuttle Run (sec)	50 Yards Dash (sec)	Pull-Ups (No)	Bent Knee Sit Ups (No)	600 Yards Run/Walk (sec)
N	Valid	225	225	266	226	226	226
	Missing	1	1	0	0	0	0
Mean		150.02	11.53	8.83	2.44	15.00	203.39
Median		152.40	11.50	8.71	1.00	15.50	194.95
Mode		124.97	10.56	9.03	0.00	20.00	216.30
Std. Deviation		30.47	1.01	1.11	2.83	6.70	41.88
Variance		928.68	1.02	1.24	8.01	44.85	1754.21
Skewness		-0.02	0.78	0.68	1.46	-0.37	0.66
Std. Error of Skewness		0.16	0.16	0.16	0.16	0.16	0.16
Kurtosis		-0.62	1.57	0.44	1.79	-0.14	-0.04
Std. Error of Kurtosis		0.32	0.32	0.32	0.32	0.32	0.32
Range		131.06	5.94	5.69	13.00	30.00	198.00
Minimum		88.39	9.33	6.67	0.00	0.00	131.36
Maximum		219.46	15.27	12.36	13.00	30.00	329.36

Table 4: Percentile norms for 8 grade Students

Grade 6 Boys						
Percentile Norms	Standing Broad Jump (Cm)	Shuttle Run (Sec)	50 Yards Dash (Sec)	Pull-Ups (No)	Bent Knee Sit Ups (No)	600 Yards Run/Walk (Sec)
1	64.01	15.22	11.92	-	-	287.82
5	94.49	14.02	11.29	-	0	279.08
10	94.79	13.30	11.10	-	-	261.04
15	100.58	12.97	10.58	-	4	253.29
20	109.73	12.75	10.23	-	5	243.03

25	116.59	12.59	10.07	-	7	234.26
30	124.97	12.50	9.82	-	8	229.69
35	124.97	12.36	9.72	0	10	221.36
40	125.27	12.18	9.49	-	11	211.29
45	128.02	11.96	9.37	-	-	202.54
50	134.11	11.76	9.20	-	12	198.28
55	141.88	11.62	9.14	-	13	193.84
60	146.30	11.40	9.07	-	14	192.14
65	149.35	11.28	8.91	1	-	187.95
70	152.40	11.14	8.63	-	15	184.34
75	155.45	11.04	8.47	2	16	179.71
80	155.75	10.88	8.39	-	18	174.84
85	167.64	10.81	8.29	3	19	164.51
90	173.74	10.59	8.18	4	20	154.80
95	188.98	10.08	7.69	6	23	146.15
99	204.22	9.72	7.35	8	26	133.45

Table 5: Percentile norms for 7 grade Students

Grade 7 Boys						
Percentile Norms	Standing Broad Jump (Cm)	Shuttle Run (Sec)	50 Yards Dash (Sec)	Pull-Ups (No)	Bent Knee Sit Ups (No)	600 Yards Run/Walk (Sec)
1	86.71	14.24	12.79	-	0	323.64
5	106.68	13.19	10.97	-	3	261.66
10	124.97	12.73	10.43	-	5	251.06
15	124.97	12.53	10.24	-	7	241.42
20	125.27	12.45	10.01	-	8	234.15
25	128.78	12.25	9.84	-	10	225.29
30	133.81	12.06	9.69	-	11	220.76

35	137.16	11.92	9.50	-	-	213.08
40	143.26	11.75	9.29	0	12	207.96
45	145.85	11.65	9.05	-	13	198.97
50	149.35	11.58	8.92	-	-	194.13
55	152.40	11.45	8.81	-	14	191.09
60	155.45	11.33	8.59	1	15	188.47
65	155.75	11.23	8.46	-	16	181.83
70	158.50	11.06	8.26	2	17	179.01
75	167.64	10.90	8.12	-	18	174.56
80	173.74	10.71	8.03	3	19	168.24
85	179.83	10.61	7.83	5	21	159.29
90	188.98	10.50	7.63	6	25	153.80
95	195.07	10.15	7.43	7	28	143.38
99	207.26	9.67	7.12	11	32	139.54

Table 6: Percentile norms for 8 grade Students

Grade 8 Boys						
Percentile Norms	Standing Broad Jump (Cm)	Shuttle Run (Sec)	50 Yards Dash (Sec)	Pull-Ups (No)	Bent Knee Sit Ups (No)	600 Yards Run/Walk (Sec)
1	89.98	14.85	12.13	-	0	320.84
5	94.79	13.30	10.91	-	1	281.49
10	106.68	12.62	10.22	-	6	260.51
15	121.92	12.36	9.93	-	7	252.08
20	124.97	12.17	9.76	-	10	237.05
25	125.27	12.04	9.46	-	11	232.89
30	130.45	11.91	9.33	0	12	222.41
35	137.16	11.85	9.18	-	13	216.18
40	143.26	11.70	9.02	-	14	208.20

45	146.30	11.61	8.86	-	-	198.59
50	152.40	11.50	8.71	1	15	194.95
55	155.45	11.35	8.58	-	17	191.20
60	155.63	11.26	8.47	2	-	188.20
65	161.54	11.12	8.34	-	18	184.00
70	168.25	11.04	8.16	3	19	175.02
75	173.74	10.87	8.00	4	-	171.24
80	176.78	10.74	7.82	-	20	165.56
85	182.88	10.56	7.67	5	21	160.84
90	192.02	10.36	7.53	7	23	153.69
95	204.22	9.94	7.23	9	25	145.30
99	212.57	9.48	6.74	12	29	133.24

Norms for Six, Seven and Eight Grade Boys

The below table indicates the performance score and its respected grades. These grades are ranging from Excellent to Poor on the five point scale. The performance score of six, seven and eight grade boys are indicated in the score column, whereas the interpretation of the score is categorized as per the grade column. ('-' same numbers for next grade)

Table 7: Norms for grade 6 Boys

Grade 6 Boys						
Grade	Performance Scores					
	Standing Broad Jump (Cm)	Shuttle Run (Sec)	50 Yards Dash (Sec)	Pull-Ups (No)	Bent Knee Sit Ups (No)	600 Yards Run/Walk (Sec)
Excellent	159 and above	10.88 and below	8.38 and Below	4 and above	18 and above	174.84 and below
Good	147 to 158	10.89 to 11.40	8.39 to 9.06	2 to 3	14 to 17	174.85 to 192.83
Average	126 to 146	11.41 to 12.19	9.07 to 9.48	1	11 to 13	192.84 to 212.41
Fair	113 to 125	12.20 to 12.75	9.49 to 10.22		6 to 10	212.40 to 243.03

Poor	112 and Below	12.76 and above	10.23 and Above	-	5 and below	243.04 and above
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Table 8: Norms for grade 7 Boys

Grade 7 Boys						
Grade	Performance Scores					
	Standing Broad Jump (Cm)	Shuttle Run (Sec)	50 Yards Dash (Sec)	Pull-Ups (No)	Bent Knee Sit Ups (No)	600 Yards Run/Walk (Sec)
Excellent	143.27 and Above	10.70 and Below	8.00 and Below	4 and Above	20 and Above	168.23 and Below
Good	125.28 to 143.26	10.71 to 11.33	8.01 to 8.58	2-3	16 to 19	168.24 to 188.47
Average	112.79 to 125.27	11.34 to 11.75	8.59 to 9.28	1	13 to 15	188.48 to 207.95
Fair	94.50 to 112.78	11.76 to 12.45	9.29 to 10.01	-	9 to 12	207.96 to 234.15
Poor	94.49 and Below	12.46 and Above	10.02 and Above		8 and Below	234.16 and Above

Table 9: Norms for grade 8 Boys

Grade 8 Boys						
Grade	Performance Scores					
	Standing Broad Jump (Cm)	Shuttle Run (Sec)	50 Yards Dash (Sec)	Pull-Ups (No)	Bent Knee Sit Ups (No)	600 Yards Run/Walk (Sec)
Excellent	179.84 and above	10.74 and below	7.8 and below	5 and above	20 and above	165.56 and below
Good	155.76 to 179.83	10.75 to 11.26	7.81 to 8.47	2 to 4	18 to 19	165.57 to 188.19
Average	143.27 to 155.75	11.27 to 11.70	8.48 to 9.02	1	14 to 17	188.20 to 208.19

Fair	124.98 to 143.26	11.71 to 12.17	9.03 to 9.76	-	10 to 13	208.20 to 237.04
Poor	124.97 and below	12.18 and above	9.77 and above		9 and below	237.05 and above

Findings and Discussion

As per data analysis findings are observed as below,

1. The data obtained under the selected fitness factor was in a normal range of normal probability curve
2. The study developed percentile norms for standing broad jump, sit-ups and pull-ups from 0 to 100 scale, the lowest value 0 denotes the lowest performance score and the highest value of the percentile denotes the highest score of the student.
3. The study also developed percentile norms for 50-yards dash, shuttle run 600 yards run/walk from 0 to 100 scale, the lowest value 0 has highest performance score and the highest value of the percentile denotes the lowest score of the student.
4. The norms of each variable were graded as poor, fair, average, good and excellent based on the grading system
5. In Standing Broad Jump overall boys’ performance was found Excellent as 19.06%, Good 22.57%, Average 19.39%, Fair 20.90% and Poor was 18.06% it shows more percentage of performance was falling in between the range of 112.77 cm to 143.25 cm.
6. In 50 Yards Dash overall boys performance were found Excellent as 19.39%, Good 20.57%, Average 20.07%, Fair 20.56% and Poor was 19.39% it shows more percentage of performance was falling in between the range of 7.81 sec to 8.47 sec.
7. In Shuttle run overall boys performance were found Excellent as 20.23%, Good 19.73%, Average 20.23%, Fair 20.40% and Poor was 19.39% it shows more percentage of performance was falling in between the range of 11.71 sec to 12.17 sec.
8. In Sit-Ups overall Boys performance were found Excellent as 23.07%, Good 16.38%, Average 21.57%, Fair 19.23% and Poor was 19.73% it shows more percentage of performance was falling above 20 Sit-Ups.
9. In Pull-Ups overall Boys performance were found Excellent as 17.39%, Good 23.07%, Average 22.90% it shows more percentage of performance was falling in between the range of 2 to 4 Pull-Ups.

10. In 600 Yards Run/Walk overall Boys performance were found Excellent as 19.89%, Good 20.06%, Average 20.06%, Fair 20.06% and Poor was 19.09% it shows more percentage of performance was falling in between the range of 165.57 sec to 237.04.

III. Conclusion

The study constructed standard norms for grade six, seven and eight boys of Mumbai city. As it is standard norms it can be used to check the physical fitness status of the same grade students of Mumbai city.

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