



Explosive Leg Strength Among School Students: A Comparative Study Using The Vertical Jump Test In Rural, Semi-Urban, And Urban Schools

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Abstract

The present study aimed to compare explosive leg strength among students studying in rural, semi-urban, and urban schools. A total 275 of school students from the three different school were selected as participants. Explosive leg strength was assessed using the Vertical Jump Test, which is commonly used to evaluate the power of the lower limb muscles. Results: The calculated t-value as follow for boys (G1 = 0.838, G2 = 0.632, G3 = 0.837) and girls (G1 = 0.110, G2 = 0.047, G3 = 0.98) less than the table value at the 0.01 level. Conclusion: - There is no significant difference between the school students (girls and boys) in term of explosive leg strength ($p < 0.01$). The analysis of the study revealed no significance difference in explosive leg strength Among school students.

Key words: physical fitness, explosive strength, vertical jump, school students, rural, semi-urban, urban, girls & boys.

INTRODUCTION

Urban and rural students' growth mostly affected by their lifestyle they both lead by different surroundings, facilities, daily routines while, we see that urban children's usually have more access to healthcare, education, technology, and sports opportunities that is why they may be sedentary and spend more time in front of screen. Rural children on the other side, typically reside in natural settings and are more involved in physical exercise such as walking, engaging outdoor games and help with household and farming-related work because they might have limited facilities for sports, healthcare, and education.

Student's whole development is greatly affected by health and physical education. It encourages students in keeping their physical health, improving their standard of fitness, and making positive habits. Students build their body's strength, endurance, mobility as well as coordination through regular physical activities such as sports, games, exercise. Furthermore, health education teaches students about disease prevention, mental health, a balanced diet, and personal hygiene. Through physical education students develop self-confidence, discipline, teamwork, and leadership qualities. Therefore, physical education and health is essential aspect of curriculum that designed to encourage students' social, psychological, and physiological development.

Leg Strength: muscle strength provides stability for movement, and supports body weight. The quadriceps, hamstrings, gluteal-muscles, and calf muscles are the main muscular group. Strong leg muscle decrease the possibility of lower limbs injuries, improve performance in sports, and make it easier to do everyday task like walking, running, sitting.

Vertical jump: the act of jumping upward is known as vertical jump or vertical hop. It is a common test to measure athletic performance and can be used as a training program to enhance strength and endurance.

Vertical jump ability is important in my sports includes football, athletics, volleyball, basketball because it required quick and powerful actions vertical jump reflect the strength and coordination of lower limb muscles such as the hamstring, quadriceps, gluteal muscle, and calf muscles.

METHODOLOGY AND PROCEDURE

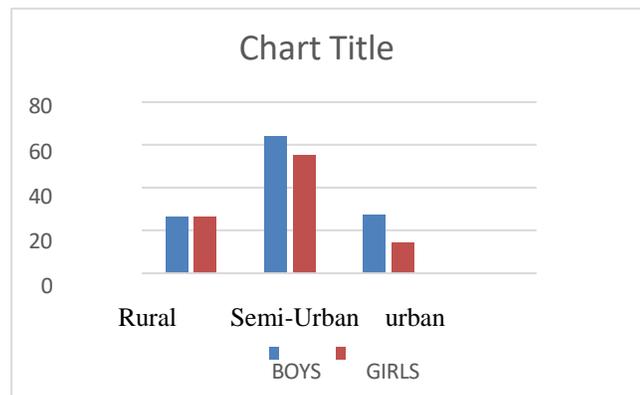
Selection of subjects

In this study random sampling method has been used for data collection. The researcher has selected total 275 subjects both boys and girls from the rural, semi-urban, urban schools of kurukshetra district of Haryana state. The age group of subjects were between 11 to 13years.

TABLE NO. – 3.1

CATEGORIZATION OF SUBJECTS

S. NO.	Category	Rural	Semi- urban	Urban
1	Male	26	64	27
2	Female	26	55	14
	Total	52	119	41

Diagram 3.1**CATEGORIZATION OF SUBJECTS****TABLE NO. – 3.2**
Detail of Schools

S.NO.	Name of the School	Male	Female	Total No. of Subjects
1	Government Khalsa school, Sunheri, Kurukshetra	26	26	52
2	SBM Gita boys, Kurukshetra	64	00	64
3	Gita girls, Kurukshetra	00	55	55
4	Som convent gurukul, Kurukshetra	27	14	41

Tool used for collection of data: Dependent Variable Vertical Jumping Ability (Explosive Strength) of the subjects were measured with Vertical Jump

**VERTICAL JUMP****Procedure for the Collection of Data:**

The investigator visited following schools as mentioned in the table 3.2 for the collection of data. Following procedure was adopted for the data collection for various dependent variables

i. Procedure for Explosive Strength: Researcher first gave brief instruction about the leg strength Vertical Jump (body stance, execution) to the subjects then demonstrate how to take body position,

legs should be open according to shoulder width and take squat position and execute the jump with explosive strength.

ANALYSIS OF DATA AND FINDINGS

The data collected with the help of various tools according to the objectives of the study, however reliable, validated, and accurate they may be getting but raw. These needs are met by systematization and organization of data i.e. editing, classification and tabulation which help in analyzing the data before it can serve any worthwhile purpose. Hence the present chapter is devoted to description, interpretation, and analysis of data.

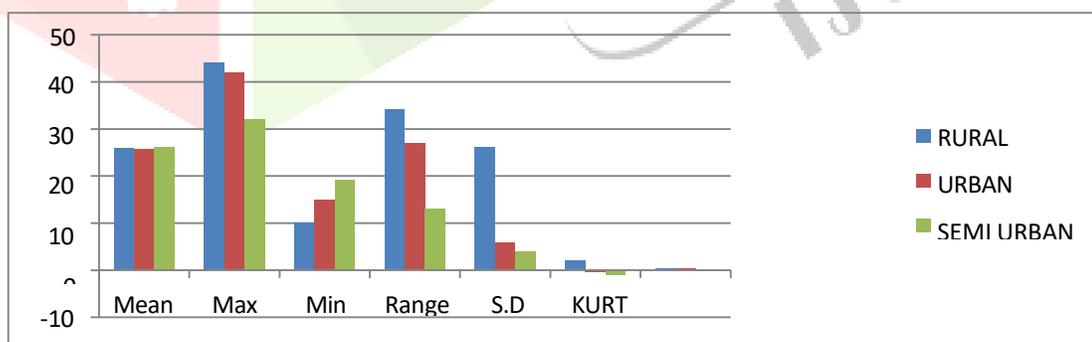
Table 4.1

DESCRIPTIVE STATISTICS OF EXPLOSIVE STRENGTH ABILITY AMONG MALE SUBJECTS OF VARIOUS SCHOOLS

S.NO	GROUP	NUMBER	MEAN	MAX	MIN	RANGE	S. D	KURT	SKEW
1	Rural	26	25.88	44	10	34	26.18	1.931	0.308
2	Semi Urban	27	26.18	32	19	13	3.79	-1.047	-0.031
3	Urban	64	25.59	42	15	27	5.89	-0.391	0.338

DIAGRAM 4.1

GRAPHICAL REPRESENTATION OF EXPLOSIVE STRENGTH ABILITY AMONG MALE SUBJECTS OF VARIOUS SCHOOLS



Description and Interpretation of Table-4.1: In the table 4.1 descriptive statistics of Explosive Strength ability of male subjects of rural school has been presented. In the table 4.1(1) the mean value of Explosive Strength ability from rural school was 25.88 with S.D 26.18. The maximum & minimum value of rural school students was 44 & 10 respectively with range 34. Range of standard error of skewness for N=26 was -0.34 to 0.34. The calculated value of skewness was 0.308, which is more than the range, hence the data was not normally distributed. The calculated value of kurtosis is more than from 0.263; the distribution of data was Leptokurtic.

In the table 4.1(2) descriptive statistics of Explosive Strength ability of male subjects of Semi Urban school has been presented. The mean value of Explosive Strength from semi-urban school students was 26.18 with S.D 3.79. The maximum & minimum value of semi-urban school students was 32 & 19 respectively with range 13. Range of standard error of skewness for N=27 is -0.34 to 0.34. The calculated value of skewness was -0.031, which is less than the range, hence the data was not normally distributed. The calculated value of kurtosis is less than from 0.263; the distribution of data was Platykurtic.

In the table 4.1(3) descriptive statistics of Explosive Strength ability of male subjects of urban school has been presented. The mean value of Explosive Strength ability from urban school was 25.59 with S.D 5.89. The maximum & minimum value of urban school students was 42 & 15 respectively with range 27. Range of standard error of skewness for N=64 is -0.24 to 0.24. The calculated value of skewness was 0.38, which is more than the range, hence the data was not normally distributed. The calculated value of kurtosis is less than from 0.263 the distribution of data was Platykurtic.

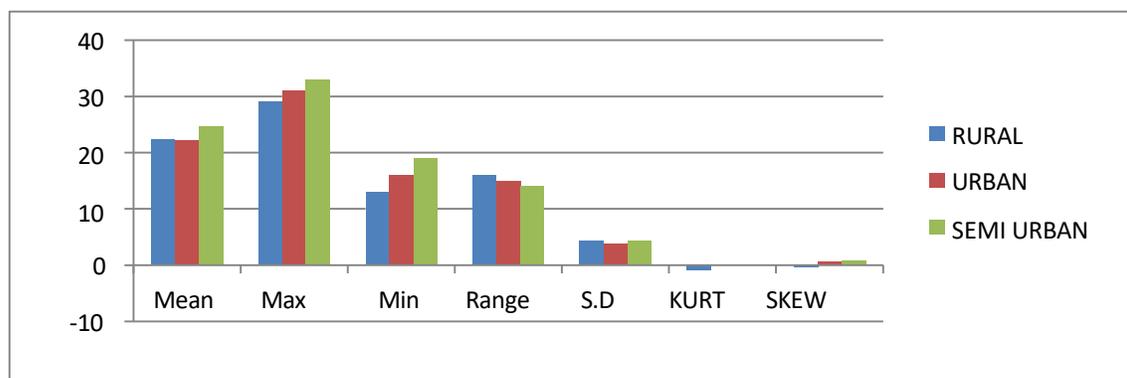
Table 4.2

DESCRIPTIVE STATISTICS OF EXPLOSIVE STRENGTH ABILITY AMONG FEMALE SUBJECTS OF VARIOUS SCHOOLS

S.NO	GROUP	NUMBER	MEAN	MAX	MIN	RANGE	S. D	KURT	SKEW
1	Rural	26	22.26	29	13	16	4.42	-0.767	-0.305
2	Semi Urban	14	24.61	33	19	14	4.35	-0.053	0.710
3	Urban	55	22.25	31	16	15	3.74	-0.058	0.564

DIAGRAM 4.2

GRAPHICAL REPRESENTATION OF EXPLOSIVE STRENGTH ABILITY AMONG FEMALE SUBJECTS OF VARIOUS SCHOOLS



Description and Interpretation of Table-4.2: In the table 4.2(1) descriptive statistics of Explosive Strength ability of Female subjects from Rural school has been presented. The mean value of Explosive Strength ability from rural school students was 22.26 with 4.42 S.D. The maximum & minimum value of Explosive Strength ability from rural school students was 29 & 13 respectively with range 16. Range of standard error of skewness for N=26 is -0.34 to 0.34. The calculated value of skewness was -0.305, which is between the range, hence the data was not normally distributed. The calculated value of kurtosis is less than from 0.263; hence the distribution of data was Platykurtic.

In the table 4.2(2) descriptive statistics of Explosive Strength ability of Female subjects from Semi-Urban has been presented. The mean value of Explosive Strength ability from Semi Urban school students was 24.61 with S.D 4.35. The maximum & minimum value of explosive strength ability from semi-urban school students was 33 & 19 respectively with range 14. Range of standard error of skewness for N=14 is -0.58 to 0.58. The calculated value of skewness was 0.71, which is more than the range, hence the data was not normally distributed. The calculated value of kurtosis is less than from 0.263; hence the distribution of data was Platykurtic.

In the table 4.2(3) descriptive statistics of Explosive Strength ability of Female subjects from Urban school has been presented. The mean value of Explosive Strength ability from urban school students was 22.25 with S.D 3.74. The maximum & minimum value of explosive strength ability from urban school students was 31 & 16 respectively with range 15. Range of standard error of skewness for N=55 is -0.24 to 0.24. Now the calculated value of skewness was 0.56, which is more than the range, hence the data was not normally distributed. The calculated value of kurtosis is less than 0.263; hence the distribution of data was Platykurtic.

Comparative analysis of Mean scores of Explosive Strength Ability for Male Subjects of various schools i.e. Rural, Semi Urban, and Urban

Table - 4.3

S.NO	Type of Schools	M 1	M 2	M.D.	S.D1	S.D 2	S.E.D	T value
1	Rural v/s Semi Urban	25.884	26.115	0.230	6.556	3.850	1.484	0.838
2	Semi Urban v/s Urban	26.115	25.593	0.521	3.850	5.897	1.045	0.632
3	urban v/s rural	25.884	25.593	0.292	6.556	5.897	1.482	0.837

Description and interpretation of table no. 4.3: According to the table 4.3.(1) the mean value of Explosive Strength ability present in the subjects studying in rural school was 25.88 and Semi Urban school students was 26.11 Their mean difference value was 0.230. The standard error of difference was 1.48. The calculated t value was 0.83, which is less than the table value at 0.01 levels (df – 38, 2.70). It reflects that there was no significant difference in the Explosive Strength ability of Male Subjects studying in rural and Semi Urban school. Hence, the hypothesis no. 1 is accepted.

Description and interpretation of table no. 4.3: According to the table 4.3.(2) the mean Explosive Strength Ability present in the subjects studying in semi-urban school was 26.11 and urban school student was 25.59 Their mean difference value was 0.52. The standard error of difference was 1.045. The calculated t value was 0.632, which is less than the table value at 0.01 levels (df – 67, 2.65). It reflects

that there was no significant difference in the Explosive Strength ability of male subjects studying in Semi Urban and Urban school. Hence, the hypothesis no. 1 is accepted.

Description and interpretation of table no. 4.3: According to the table 4.3(3) the mean Explosive Strength Ability present in the subjects studying in school with Rural is 25.88 and, in the subjects, studying in school with Urban is 25.59 and means difference is 0.29. The standard error of difference is 1.48. The calculated t value is 0.83, which is less than the table value at 0.01 levels (df – 79, 2.64). It reflects that there exists no significant difference in the Explosive Strength ability of Male Subjects studying in Urban and rural school. Hence, the hypothesis no. 1 is accepted.

Comparative analysis of Mean scores of Explosive Strength Ability for female Subjects of various Categories (Rural, Semi Urban, Urban)

Table - 4.4

S.NO	Type of Schools	M 1	M 2	M.D.	S.D 1	S.D 2	S.E.D	T value
1	Rural v/s Semi Urban	22.26	24.61	2.34	4.42	4.350	1.45	0.11
2	Semi Urban v/s Urban	24.61	22.25	2.36	4.350	22.25	1.26	0.047
3	urban v/s rural	22.26	22.25	0.014	4.42	22.25	1.003	0.98

Description and interpretation of table no. 4.4: According to the table 4.4.(1) the mean value of Explosive Strength Ability of rural school students was 22.26 and semi-urban school students was 24.61 Their mean difference value was 2.34. The standard error of difference was 1.45. The calculated t value was 0.11, which is less than the table value at 0.01 levels (df – 38, 2.70). It reflects that there was no significant difference in the Explosive Strength Ability of female Subjects studying in rural and semi-urban school. Hence, the hypothesis no. 1 is accepted.

Description and interpretation of table no. 4.4: According to the table 4.4.(2) the mean Explosive Strength Ability of semi-urban school students was 24.61 and urban school students was 22.25 Their mean difference value was 2.36. The standard error of difference was 1.26. The calculated t value was 0.047, which is less than the table value at 0.01 levels (df – 67, 2.65). It reflects that there was no significant difference in the Explosive Strength Ability of female Subjects studying in semi-urban and urban School. Hence, the hypothesis no. 1 is accepted.

Description and interpretation of table no. 4.4: According to the table 4.4.(3) the mean value of Explosive Strength Ability of subjects studying in rural school was 22.26 and urban school students was 22.25 Their mean difference value was 0.014. The standard error of difference was 1.003. The calculated t value was 0.98, which is less than the table value at 0.01 levels (df – 79, 2.64). It reflects that there was no significant difference in the Explosive Strength Ability of female Subjects studying in rural and urban school. Hence, the hypothesis no. 1 is accepted.

CONCLUSIONS AND SUMMARY

In the male category no significant difference has been found in the Explosive Strength Ability of subjects studying in rural, semi-urban, urban schools.

Similarly, in the female category no significant difference has been found in the Explosive Strength Ability of subjects studying in rural, semi-urban, urban Schools.

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