

“A COMPARATIVE STUDY OF DEVELOPMENT OF STRENGTH ABILITIES IN NORMAL AND IN DEAF AND DUMB GIRLS BETWEEN 8 YEARS TO 14 YEARS”

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ABSTRACT

A comparative study of development of strength abilities in normal and deaf and dumb girls between 8 to 14 years is administered on around 350 students of different schools who were taking formal education. Out of 350 students 175 were selected from normal category and 175 from physically challenged i.e., deaf and dumb category. In each group 25 girls were selected (25 subjects in normal girls and in each age group i.e., 8, 9, 10, 11, 12, 13, & 14 years totaling to 175; 25 subjects in deaf and dumb in each age group i.e., 8, 9, 10, 11, 12, 13, & 14 years totaling to 175). These subjects were tested initially in Upper extremity explosive strength, Abdomen explosive strength, Lower extremity explosive strength and the same subjects were exposed to the same tests after exactly one year without any formal sports training and the development in their strength abilities were noted. After the statistical treatment of data by utilizing “t” test the following findings were noted: The hands and legs strength development in normal girls is found to be steadily increasing from 8th to 14th year whereas the abdominal strength development is observed reducing. The deaf dumb girls have good steady increase development in hand, abdomen and legs.

INTRODUCTION:

A comprehensive list of components of motor ability for performance of various physical activities (including sports) include muscular strength, muscular endurance, muscular power, cardiovascular endurance (alternatively also known as cardiopulmonary endurance), agility, speed, balance, flexibility, reaction time, coordination (eye-foot coordination, eye-hand coordination, whole-body coordination). In addition, traits like simple motor response, reflexes, sensory input and awareness of space and tempo (characteristic speed and rhythm of movement) are also considered important in motor performance- ability especially during the early years of body development.

Strength is a conditional ability i.e., it depends largely on the energy liberation process in the muscles. Strength is also perhaps the most important motor ability in sports as it is a direct product of muscle contractions. All movements in sports are caused by muscle contractions and therefore, strength is apart and parcel of all motor abilities, technical skills and tactical actions. Strength should not be considered a product of only muscular contractions. It is, infact, a product of voluntary muscle contractions caused by the neuromuscular system. In sports movements, strength always appears in some combination with the duration and speed of movement i.e., in combination with endurance and speed abilities, on this basis strength ability can be divided into three types viz. maximum strength, explosive strength, strength endurance.

The need today is to search some extraordinary talent in an individual for the laurels in international sports arena. In this case it becomes obvious that the search should not limit only with the normal. The qualities that an individual possess should be innate and may be nurtured with good scientific platform, deaf dumb being no exception to it. Hence the search to prove the innate qualities of the deaf dumb and bring them to equal stature with normal.

NEED OF THE STUDY:

The population of the normal mass is comparatively more to the deaf dumb resulting the opportunities designed are more for normal mass. But at the same time there is a society always struggling to uplift the physically handicapped and trying to give them the best and equal opportunities so that the handicapped ability should not be the hurdle in normal and natural unfolding of an individual.

Considering the inability, which has the opportunity to be converted into compensatory ability for excelling in the sports arena the researcher, felt high need to evaluate the development of strength ability among deaf dumb and compare with the normal, which is a performance prerequisite.

OBJECTIVES OF THE STUDY:

1. To find out, assess and analyze the developments taking in strength abilities among normal girls and that of deaf dumb at particular age group.
2. To understand if any higher or compensatory ability among deaf dumb children is noticed when compared to the normal children.
3. To understand various parameters of strength ability in certain age group of certain physical abnormality.
4. To understand scientific base for methods of training physically challenged children.
5. To understand how the society would help its weak counterpart.

SIGNIFICANCE OF THE RESEARCH:

1. The study may reveal the physical and mental problems of deaf dumb children.
2. The study may also profound a training methodology and loading procedure in strength training for physically challenged children in specific age group.
3. Results may also be helpful to enhance sports terminology communication skills with physically handicapped children.
4. Evaluation of development of strength abilities may fetch platform for establishing training methodology for enhancing performance in specific sports.
5. The comparison of development of strength abilities will give clear picture of the positive and negative aspects of the strength abilities, which in turn ensure the proper training.

DEFINITION OF THE TERMS:

DEVELOPMENT:

Development is a process of qualitative transformation, which brings about progressive changes towards maturity and functional improvement in the organism of human being.

GROWTH:

Growth is a process anatomical in nature involves structural changes and quantitative to measure.

STRENGTH:

“Strength is the ability to overcome resistance or to act against resistance”.

NORMAL CHILD:

Normal: Typical; usual; healthy; according to the rule or standard. If a child is found to be disease free, exhibits proper growth and development according to the age in its physical, mental and social health and status, then he/she may be defined as a normal child.

DEAF AND DUMB:

Deaf is unable to hear; hearing indistinctly; hard of hearing.

Dumb: is mute; speechless; unable to speak.

8 YEARS TO 14 YEARS (CHRONOLOGICAL AGE):

Chronological age is the number of years and days elapsed since birth.

REVIEW OF RELATED LITERATURE

* From 1920 to 1930, one of the conclusions Piaget drew from watching his children grow was the conviction that thought sprang from actions, and not from other sources such as language.

* Newell C. Kephart was a clinical psychologist who, in several books, a series of 19 one-hour films, and several articles, has outlined a theory proposing that motor learning is the basis of all learning.

* Studies summarized by Bloom have pointed out the difficulty of predicting later intelligence by evaluating the perceptual-motor attributes of young children⁷.

* Bayley, who in 1968 published a longitudinal study of 54 individuals from birth to 36 years of age, has found that an infant's abilities can be factored into six separate attributes by the age of 5 months: visual following, social responsiveness, perceptual interest, manual dexterities, vocalizations, and object relations.

* Rutherford found that although the boys had motorically gained significantly, the girls had not. Kephart's rather carefully designed methods of motor training of neurologically impaired youngsters should prove of value when attempting to improve motor functions⁹.

* Delacto's theory is based on a view of neural function which suggests that specific “layers” of the brain mediate discrete motor functions.

* Minerva selected one from each group (identical twins and fraternal twins) and gave \ them a six month period of motor training involving a variety of tasks. Minerva concluded that the more complex tasks are modifiable through training, but the more basic locomotors functions are not.

* In a 1972 study, based upon the observations of over 700 children over a seventeen-year period, Emma Pikler adds further data to the controversy concerning whether or not

various kinds of early environmental conditions will elicit marked changes in motor development.

- * Werner recent data indicate that with consistent and sophisticated teaching, some kinds of motor competencies may be accelerated during early childhood.

- * A study by Walters, presents evidence that the child who engages in prolonged and vigorous pre-birth movements can be counted upon to be advanced motorically during the first few years of life.

- * Hartman found that the hurdle jump scores when compared to other standard measures of motor ability then in use, such as the vertical jump, the standing broad jump, the baseball distance throw and the 35 yard dash, yielded 'rs' ranging from 0.4 to 0.56 Other investigators correlated the scores lead to more extensive investigations with an even wider variety of tests similar to those carried out with adult males.

- * In 1940 Aileen Carpenter, using the Johnson test together with other measures, evaluated the abilities of 530 children and found that three separate factors emerged.

- * In 1941 Carpenter investigated various measures of speed in children and found that again three separate factors were isolated. Running speed tests were related but were independent of tests in which strength was evaluated.

METHODOLOGY

SAMPLE:

The samples of this study is randomly selected form different schools with their date of birth lying between 1999 to 1993 in normal subjects (girls) and deaf dumb subjects (girls). The selected age groups of the subjects were from 8 to 14 years. In each group 30 subjects were selected initially with a margin of ± 5 . All the selected subjects were non-sportsman staying either in school hostels or at their residence to ensure the untrained development in strength abilities. In all 350 subjects were tested initially and the same 350 subjects were tested finally after one academic year (12 months). The tests were conducted for two days for four hours on each group of 25 subjects approximately. In all 350 subjects were considered for obtaining the difference between development is evaluated by subtracting the initial test score from the final test score. Every subject was allotted with a code and a separate self contained form for test results. The tests were selected in the aspects of growth and development. In growth, height and weight is evaluated and in development of motor abilities the researcher has selected the standard tests in speed, strength, endurance, flexibility, coordinative abilities and their complex forms for evaluation. The tests are administered individually under standard conditions applicable for specific tests and the time period required between two tests is amply considered.

VARIABLES:

(1) Normal girls. (2) Deaf dumb girls.

DEVELOPMENT OF SPEED ABILITIES: (1) Upper extremity explosive strength. (2) Abdomen explosive strength. (3) Lower extremity explosive strength.

TOOLS AND MEANS:

The research scholar has used some of the selected strength ability tests which are applicable to the selected age group and samples and are universally accepted and established standard tests for assessing development of speed abilities.

Strength ability tests: (1) Medicine ball put for Upper extremity explosive strength. (2) Sit-ups for Abdomen explosive strength. (3) Standing vertical jump for Lower extremity explosive strength.

PROCEDURE:

The subjects were selected from different schools in normal category (girls) and deaf dumb schools (girls). In all 03 tests were selected for evaluating the development of strength abilities of the subjects between 8 to 14 years. The tests were administered with all specified and standard conditions starting with warming up exercises, optimum active rest periods in between and cooling down at the end. The condition of the subjects was observed normal and motivated to take part in the tests. An introductory talk regarding the initial day's workout is assessed for confirmation of tirelessness and recovered state.

STATISTICAL METHODS:

To analyze the collected data the scores are arranged according to the comparison and in sequential order so as to find out the statistical values. The following statistical variables are selected for comparing, analyzing and interpretation of numerical values and basing on which the findings are discussed.

(1) Mean is computed by adding all the scores and then dividing by the number of scores involved. The mean is used in the study to measure the average development.

(2) For testing the null hypothesis for the difference between various sample means the t-Test is used at significance of .05 levels.

RESULTS AND DISCUSSIONS:

The hands and legs strength development in normal girls is found to be steadily increasing from 8th to 14th year whereas the abdominal strength development is observed reducing. The deaf dumb girls have good steady increase development in hand, abdomen and legs.

RESULTS OF THE COMPARISON OF THE DEVELOPMENT OF UPPER EXTREMITIES EXPLOSIVE STRENGTH OF GIRLS (NORMAL AND DEAF-DUMB) BETWEEN 8 YEARS TO 14 YEARS (MEDICINE BALL THROW)

Normal girls:

1. The maximum mean of development of upper extremity explosive strength in normal girls was found at the age of 11th year, which is 0.17mts and the minimum at 12th year, which is 0.11mts. The average mean of development of upper extremity explosive strength in normal girls between 8 to 14 years is found to be 0.14mts.

2. The standard deviation of development of upper extremity explosive strength in normal girls is found maximum at the age of 11th year, which is 0.12 and minimum at the age of 14th year, which is 0.05. The average standard deviation of development of upper extremity explosive strength in normal girls between 8 to 14 years is found to be 0.08.
3. The correlation of development of upper extremity explosive strength in normal girls between 8 to 14 years of age groups is found as high as 0.95.

Deaf-dumb girls:

1. The maximum mean of development of upper extremity explosive strength in deaf-dumb girls was found at the age of 8th year, which is 0.16mts and the minimum at 9th years, which is 0.09mts. The average mean of development of upper extremity explosive strength in deaf-dumb girls between 8 to 14 years is found to be 0.12mts.
2. The standard deviation of development of upper extremity explosive strength in deaf-dumb girls is found maximum at the age of 8th year, which is 0.10 and minimum at the age of 10th year, which is 0.051. The average standard deviation of development of upper extremity explosive strength in deaf-dumb girls between 8 to 14 years is found to be 0.06.
3. The correlation of development of upper extremity explosive strength in deaf-dumb girls between 8 to 14 years of age groups is found as high as 0.96.

COMPARISON OF GIRLS (Normal and deaf-dumb):

The average mean of development of upper extremity explosive strength of normal girls between 8 to 14 years is 0.14mts, which is more than 0.12mts of the deaf-dumb girls between 8 to 14 years. The difference of mean of development of upper extremity explosive strength between normal girls and that in the deaf-dumb girls is 0.02mts, which is insignificant. The maximum mean of development of upper extremity explosive strength in normal girls is found at the age of 11th year, which is 0.17mts and that in the deaf-dumb girls it is at the age of 8th year, which is 0.16mts.

Table No. IV.10: evaluation of significance of development in upper extremity explosive strength in normal and deaf-dumb (girls) by using t-test and F-test.

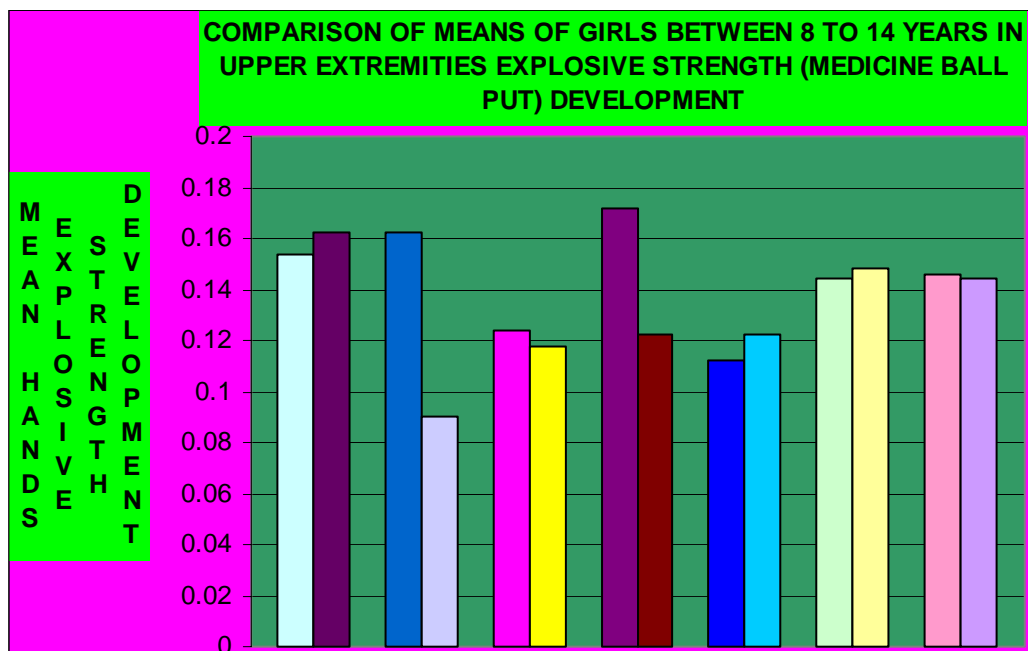
GIRLS (NORMAL & DEAF-DUMB)	t-Test Results	F-Test Results	COMMENTS
08 NG & DDG	0.377	0.198	Insignificant

09 NG & DDG	0.0033	0.272	Insignificant
10 NG & DDG	0.160	3.1E-50	Insignificant
11 NG & DDG	0.044	0.007	insignificant
12 NG & DDG	0.318	0.044	Insignificant
13 NG & DDG	0.429	0.198	Insignificant
14 NG & DDG	0.451	0.809	insignificant

* Significant at 0.05 level.

Table: Mean values and comparison of the category of subjects Girls (Normal and Deaf and Dumb) in Medicine ball put (Explosive arm strength)

MEAN VALUES AND COMPARISON OF THE CATEGORY OF SUBJECTS: GIRLS (N & DD)	MEDICINE BALL PUT INITIAL	MEDICINE BALL PUT FINAL	MEDICINE BALL PUT DEVELOPMENT
NORMAL GIRLS 08 YEARS	1.848	2.002	0.154
DEAF & DUMB GIRLS 08 YEARS	2.238	2.4	0.162
NORMAL GIRLS 09 YEARS	2.194	2.356	0.162
DEAF & DUMB GIRLS 09 YEARS	1.862	1.952	0.09
NORMAL GIRLS 10 YEARS	2.31	2.434	0.124
DEAF & DUMB GIRLS 10 YEARS	1.976	2.094	0.118
NORMAL GIRLS 11 YEARS	2.646	2.818	0.172
DEAF & DUMB GIRLS 11 YEARS	2.07	2.192	0.122
NORMAL GIRLS 12 YEARS	2.368	2.48	0.112
DEAF & DUMB GIRLS 12 YEARS	2.48	2.602	0.122
NORMAL GIRLS 13 YEARS	2.416	2.56	0.144
DEAF & DUMB GIRLS 13 YEARS	2.546	2.694	0.148
NORMAL GIRLS 14 YEARS	2.638	2.784	0.146
DEAF & DUMB GIRLS 14 YEARS	2.588	2.732	0.144



RESULTS OF THE COMPARISON OF THE DEVELOPMENT OF ABDOMEN STRENGTH OF GIRLS (NORMAL AND DEAF-DUMB) BETWEEN 8 YEARS TO 14 YEARS (SIT-UPS)

Normal girls:

1. The maximum mean of development of abdomen explosive strength in normal girls was found at the age of 9th year, which is 2.84 and the minimum at 13th year, which is 1.16. The average mean of development of abdomen explosive strength in normal girls between 8 to 14 years is found to be 1.86.
2. The standard deviation of development of abdomen explosive strength in normal girls is found maximum at the age of 13th year, which is 2.62 and minimum at the age of 9th year, which is 1.49. The average standard deviation of development of abdomen explosive strength in normal girls between 8 to 14 years is found to be 2.02.
3. The correlation of development of abdomen explosive strength in normal girls between 8 to 14 years of age groups is found as high as 0.90.

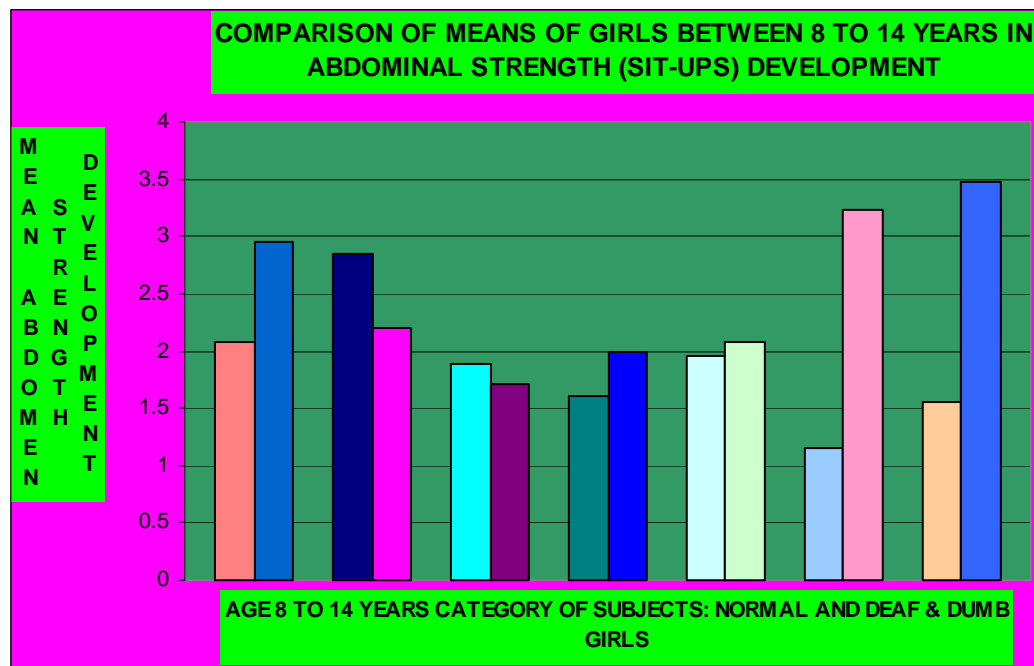
Deaf-dumb girls:

1. The maximum mean of development of abdomen explosive strength in deaf-dumb girls was found at the age of 14th year, which is 3.48 and the minimum at 10th years, which is 1.72. The average mean of development of abdomen explosive strength in deaf-dumb girls between 8 to 14 years is found to be 2.52.
2. The standard deviation of development of abdomen explosive strength in deaf-dumb girls is found maximum at the age of 12th year, which is 3.98 and minimum at the age of 10th year, which is 0.84. The average standard deviation of development of abdomen explosive strength in deaf-dumb girls between 8 to 14 years is found to be 2.07.
3. The correlation of development of abdomen explosive strength in deaf-dumb girls between 8 to 14 years of age groups is found as high as 0.79.

Table: Mean values and comparison of the category of subjects Girls (Normal and Deaf and Dumb) in Sit -ups (Abdominal strength)

MEAN VALUES AND COMPARISON OF THE CATEGORY OF SUBJECTS: GIRLS (N & DD)	SIT-UPS INITIAL	SIT-UPS FINAL	SIT-UPS DEVELOPMENT
NORMAL GIRLS 08 YEARS	19.36	21.44	2.08
DEAF & DUMB GIRLS 08 YEARS	23.56	26.52	2.96

NORMAL GIRLS 09 YEARS	23	25.84	2.84
DEAF & DUMB GIRLS 09 YEARS	22.56	24.76	2.2
NORMAL GIRLS 10 YEARS	18.72	20.6	1.88
DEAF & DUMB GIRLS 10 YEARS	23.96	25.68	1.72
NORMAL GIRLS 11 YEARS	21.08	22.68	1.6
DEAF & DUMB GIRLS 11 YEARS	27.84	29.84	2
NORMAL GIRLS 12 YEARS	22.6	24.56	1.96
DEAF & DUMB GIRLS 12 YEARS	30.96	33.04	2.08
NORMAL GIRLS 13 YEARS	23.56	24.72	1.16
DEAF & DUMB GIRLS 13 YEARS	29.88	33.12	3.24
NORMAL GIRLS 14 YEARS	23.6	25.16	1.56
DEAF & DUMB GIRLS 14 YEARS	27.04	30.52	3.48



COMPARISON OF GIRLS (Normal and deaf-dumb):

The average mean of development of abdomen explosive strength of normal girls between 8 to 14 years is 1.86, which is less than 2.52 of the deaf-dumb girls between 8 to 14 years. The difference of mean of development of abdomen explosive strength between normal girls and that in the deaf-dumb girls is 0.66, which is insignificant. The maximum mean of development of abdomen explosive strength in normal girls is found at the age

of 9th year, which is 2.84 and that in the deaf-dumb girls it is at the age of 14th year, which is 3.48.

Table No. IV.12: evaluation of significance of development in abdomen strength in normal and deaf-dumb (girls) by using t-test and F-test.

GIRLS (NORMAL & DEAF-DUMB)	t-Test Results	F-Test Results	COMMENTS
08 NG & DDG	0.073	0.984	Insignificant
09 NG & DDG	0.055	0.485	Insignificant
10 NG & DDG	0.338	0.0009	Insignificant
11 NG & DDG	0.287	0.008	insignificant
12 NG & DDG	0.447	0.005	Insignificant
13 NG & DDG	0.001	0.095	Insignificant
14 NG & DDG	0.0003	0.024	insignificant

* Significant at 0.05 level.

**RESULTS OF THE COMPARISON OF THE DEVELOPMENT OF LOWER EXTREMITIES
EXPLOSIVE STRENGTH OF GIRLS (NORMAL AND DEAF-DUMB)
8 YEARS TO 14 YEARS (STANDING VERTICAL JUMP)**

Normal girls:

1. The maximum mean of development of lower extremities explosive strength in normal girls was found at the age of 13th year, which is 3.52cms and the minimum at 8th year, which is 1.36cms. The average mean of development of lower extremities explosive strength in normal girls between 8 to 14 years is found to be 2.23cms.
2. The standard deviation of development of lower extremities explosive strength in normal girls is found maximum at the age of 8th year, which is 1.80 and minimum at the age of 11th year, which is 1.08. The average standard deviation of development of lower extremities explosive strength in normal girls between 8 to 14 years is found to be 1.31.
3. The correlation of development of lower extremities explosive strength in normal girls between 8 to 14 years of age groups is found as high as 0.92.

Deaf-dumb girls:

1. The maximum mean of development of lower extremities explosive strength in deaf-dumb girls was found at the age of 14th year, which is 2.96cms and the minimum at 9th years, which is 1.24cms. The average mean of development of lower extremities explosive strength in deaf-dumb girls between 8 to 14 years is found to be 2.07cms.
2. The standard deviation of development of lower extremities explosive strength in deaf-dumb girls is found maximum at the age of 8th year, which is 2.07 and minimum at the age of 8th year, which is 2.34. The average standard deviation of development of lower extremities explosive strength in deaf-dumb girls between 8 to 14 years is found to be 1.35.
3. The correlation of development of lower extremities explosive strength in deaf-dumb girls between 8 to 14 years of age groups is found as high as 0.88.

COMPARISON OF GIRLS (Normal and deaf-dumb):

The average mean of development of lower extremities explosive strength of normal girls between 8 to 14 years is 2.23cms, which is more than 2.07cms of the deaf-dumb girls between 8 to 14 years. The difference of mean of development of lower extremities explosive strength between normal girls and that in the deaf-dumb girls is 0.16cms, which is insignificant. The maximum mean of development of lower extremities explosive strength in normal girls is found at the age of 13th year, which is 3.52cms and that in the deaf-dumb girls it is at the age of 14th year, which is 2.96cms.

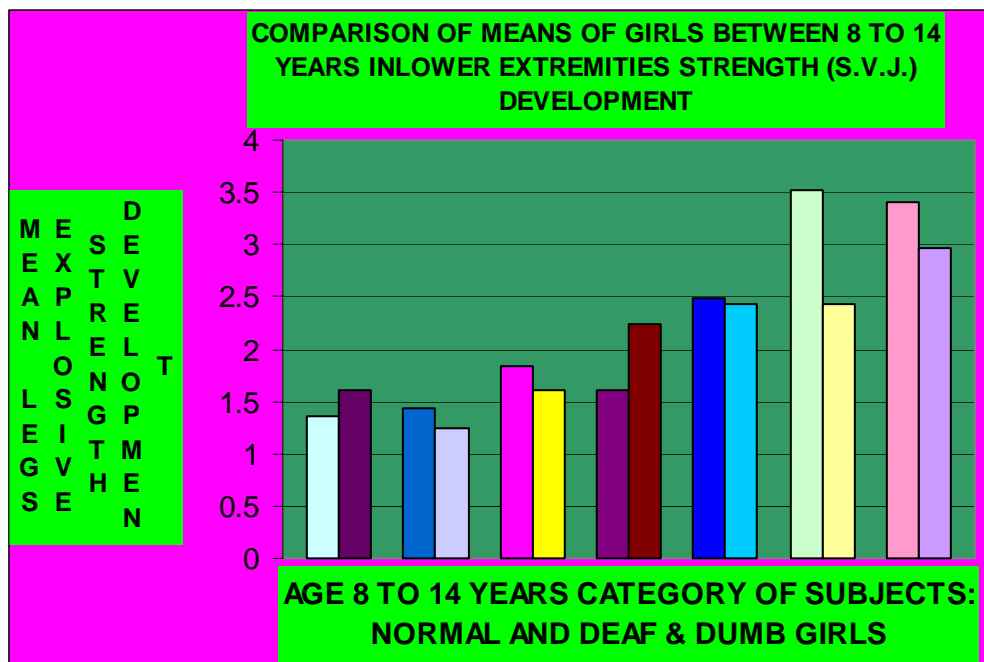
Table No. IV.14: evaluation of significance of development of lower extremity explosive strength in normal and deaf-dumb (girls) by using t-test and F-test.

GIRLS (NORMAL & DEAF-DUMB)	t-Test Results	F-Test Results	COMMENTS
08 NG & DDG	0.343	0.202	Insignificant
09 NG & DDG	0.335	0.511	Insignificant
10 NG & DDG	0.193	0.015	Insignificant
11 NG & DDG	0.012	0.320	insignificant
12 NG & DDG	0.458	0.181	Insignificant
13 NG & DDG	0.001	0.995	Insignificant
14 NG & DDG	0.100	0.357	insignificant

* Significant at 0.05 level.

Table: Mean values and comparison of the category of subjects Boys (Normal and Deaf and Dumb) in standing vertical jump (Explosive leg strength)

MEAN VALUES AND COMPARISON OF THE CATEGORY OF SUBJECTS: GIRLS (N & DD)	S.V.J. INITIAL	S.V.J. FINAL	S.V.J. DEVELOPMENT
NORMAL GIRLS 08 YEARS	17.56	18.92	1.36
DEAF & DUMB GIRLS 08 YEARS	20.72	22.32	1.6
NORMAL GIRLS 09 YEARS	20.48	21.92	1.44
DEAF & DUMB GIRLS 09 YEARS	18.4	19.64	1.24
NORMAL GIRLS 10 YEARS	20.52	22.36	1.84
DEAF & DUMB GIRLS 10 YEARS	18.76	20.36	1.6
NORMAL GIRLS 11 YEARS	24.72	26.32	1.6
DEAF & DUMB GIRLS 11 YEARS	26.24	28.48	2.24
NORMAL GIRLS 12 YEARS	22.44	24.92	2.48
DEAF & DUMB GIRLS 12 YEARS	23.52	25.96	2.44
NORMAL GIRLS 13 YEARS	23.04	26.56	3.52
DEAF & DUMB GIRLS 13 YEARS	24.2	26.64	2.44
NORMAL GIRLS 14 YEARS	27.2	30.6	3.4
DEAF & DUMB GIRLS 14 YEARS	23.8	26.76	2.96



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