

**A Comparative Study of Anthropometric Measurements Related to Abdomen Skinfold
among Normal and Deaf-Dumb Children between 8 to 14 Years**
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ANTHROPOMETRY: Anthropometry, measurement of body structure is the oldest type of body measurement known dated back to the beginning of recorded history. Sulpiastri investigated the outline of the body by dividing it into 480 parts. The ancient Egyptians also used a rough sort of Anthropometry during the period from the thirty fifth to twenty second Century B.C. “Anthropometry, measurement of the biological oneness of mankind is far more significant than the relatively superficial differences”. Anthropometric measurements have been a part of physical education since its inception in this country. The two Greek words ‘Anthropos’ and ‘Metrien’ gives birth to a new term ‘Anthropometry’. Anthropos means ‘Man’ and ‘Metrien’ means to measure. Therefore when we speak literally Anthropometry is the measurement of the body to discover its exact dimensions and the propositions of its parts. Anthropometric measurement consists of objective measurement of structure and of functions of the body. The measurement of structures includes such items as Weight, total Height, and girth of muscles, the width, the depth and the circumstance of the chest. The measurement of function includes such items as pulse rate, venous and Venus blood pressures muscular strength, basal metabolic rate estimated from cardio vascular variable, posture and breathing capacity. Two of the accepted biological principles are “Function decides structure and structure decides function”. Organs and muscles that are well used will develop the proper growth and development. Right from the very beginning the selection of the athletes is based on a complex of physical qualities. “The human performance can be viewed on the expression of a number of components called performance factors, some of which are general factors and some of which are specific factors”. Historically some very comprehensive human capabilities have been suggested, such as general intelligence, physical fitness and general athletic ability. For scientific training and special factors like physique and body composition play an important role. Top performance in any sport normally bring with them elements which makes the previous technique appears less economical and less effective, such elements assert an influence only if they are accompanied by physical condition (Rasch and Burke, 1973). Anthropometric variable and body composition are very important factors for achieving high level of performance in standard competition. Body size characteristics may become important in determining success in many sports. Height is an advantage in sports such as Kabaddi players and arm reach is an asset to the reach the touch line and boxer (Reilly, et al. 1990).

Here the researcher wants to consider single aspect and i.e., body composition profiles. The researcher is in pursuit to find out if any specific compensatory qualities are found among the physically challenged children, which will be beneficial for the development of sports performance in certain age group, also the trainability of body composition which is one of the performance factors.

“Sound education is the art of helping human beings of all ages to grow and develop to a fuller stature of mind, body and spirit, and to live well in their world” –L. Arnaud Reid

Physical education has an important part to play in helping children develop in stature of mind and spirit as well as body; children with ‘special needs’ may be helped to ‘live well in their world’ even if that world is more limited than that of their more fortunate peers.

Whatever the educational situation, it is to give children the joys and excitement of physical activity and play in some form. This natural childhood activity should be used to give physically challenged children as much opportunity as possible for independence and for acceptance by other children.

Body- mind relationship: The idea that physical well-being and motor skill has impact upon other aspects of life and adds to the quality of life is not new. The Latin tag 'mens sana in corpore sano' has been the watchword of others besides professional physical educationalists. The Greeks emphasized the importance of balance and harmony of mind and body. Socrates stated 'It is a matter of common knowledge that grave mistakes can often be traced to bad health.' But from time to time since the fifth century BC there has been the notion that one can educate the mind of man and ignore his body. This idea persists today in the teaching of educational philosophers such as R.S. Peter and his followers, who appear to think of man as an intellectual being without a body and perhaps without a soul. None the less twentieth-century doctors are very aware of the psychosomatic unity of man and acknowledge not only that the body may influence the mind but that the mind can have tremendous upon the body.

The Deaf child: The deaf child hearing impairment is often a result of sensor neural deficits caused through cochlear damage⁷. Equilibrium deficits with a concomitant loss of balance and coordination may compound the athlete's disability if there has been damage to the semicircular canals or vestibular apparatus. However, the greatest limitation which deaf athletes usually confront is their inability to communicate effectively with other individuals. This inability can be overcome by the use sign language and other methods of visual cueing. Deaf athletes can also compensate for their hearing loss by maximizing their visual abilities through training powers of observation and peripheral vision. Acquisition of these skills enables most deaf persons to participate in almost any athletic or fitness activity.

Objectives of the Study:

1. To find out, assess and analyze the abdomen skinfold among normal children and that of deaf-dumb at particular age group.
2. To study the body composition abdomen skinfold in boys and girls (normal and deaf-dumb) between 08 to 14 years.
3. To compare the body composition abdomen skinfold among boys and girls (normal and deaf-dumb) between 08 to 14 years.

Hypothesis:

H-01: According to the researcher, there may be some compensatory physical and mental abilities with physically challenged children.

H-02: The researcher hypothesize that concrete relationship and differences in the body composition; abdomen skinfold between 08 years to 14 years of normal and that of deaf and dumb children.

H-03: The study of body composition abdomen skinfold and its comparison of deaf-dumb are at par to that normal.

H-04: The researcher hypothesize that though being deaf-dumb the children do not show considerable differences in the body profiles abdomen skinfold to that in normal children.

Delimitations:

1. The study is delimited to both boys and girls.
2. The study is further delimited to the age group between 08 to 14 years.
3. The study is delimited to only deaf-dumb (boys) category in physically challenged children.
4. The study is delimited to the standard body composition profiles only abdomen skinfold applicable for specific age groups and sex.
5. The study is further delimited to the school going children in both normal and deaf-dumb.

Limitations:

1. Diet and rest of the children was a limitation.
2. Physical, mental, weather, school, house and surrounding conditions were a limitation.
Organization of the tests was adjusted with the concerned school's time tables.

Methodology

Sample:

The samples of this study are randomly selected from different schools with their date of birth lying between 1993 and 1999 in normal (boys and girls) and deaf-dumb subjects (boys and girls). The selected age groups of the subjects were from 08 to 14 years. In each group 25 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 body composition profiles only abdomen skinfold. 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. In growth, biceps and calf girths is evaluated. The tests were administered individually under standard conditions applicable for specific tests with required calibration.

Variables:

Independent Variables:

1. Normal boys and girls.
2. Deaf-dumb boys and girls.

Interweaving Variables:

(1) Sex: Boys and girls (2) Age: 08 to 14y years. (3) Criteria: Non sportsman. (4) Times: Initial

Dependent Variables:

Growth:

Abdomen skinfold

Definition of the Growth and Development Factors:

Abdomen Skinfold: It is the thickness of the double layer of skin plus subcutaneous fat on the superior side of the navel over the abdomen muscles.

Tools and Means:

Means Used:

1. **Personal data bank:** It is used to collect the information of an individual. Personal data bank consists of the following aspect: Full name, name and address of the school, date of birth and age, gender, deaf-dumb/ normal, diet (vegetarian/ mix), sportsman / non-sportsman.
2. **Body Composition Profiles:**
 - Abdomen skinfold

Procedure:

The subjects were selected from different schools in normal category (boys and girls) and deaf-dumb schools (boys and girls). In all 14 testes were selected for evaluating the growth of the subjects between 08 to 14 years. To have the difference of data for assessing the development it was decided to organize the test with gap of one year. The subjects were tested initially for their growth from 02nd to 7th July 2011. The sequence of the tests was so organized as follows:

Abdomen skinfold

- **Abdomen Skinfold:** It is the thickness of the double layer of skin plus subcutaneous fat on the superior side of the navel over the abdomen muscles.

Collection of Data:

The subjects were selected from different schools in normal category (boys and girls) and deaf-dumb schools (boys and girls). In all 14 testes were selected for evaluating the growth of the subjects between 08 to 14 years. To have the difference of data for assessing the development it was decided to organize the test after a gap of one year. The scores are then entered individually in the forms provided accordingly. For identification of variables different colours are used: Normal boys- yellow; Deaf-dumb boys- blue; Normal girls- Green and Deaf-dumb girls- Pink. The table containing the most initial and most final results and its difference mean is considered for the statistical findings.

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.

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 in growth and development.

Standard Deviation is computed in the study for the measures of variability. Standard deviation reflected the magnitude of the deviations of the scores from their mean.

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:**Results:**

Table No. 1: Mean and Standard Deviation of Biceps Girth, and Calf Girth

| | Mean Abdomen Skinfold | Standard Deviation of Abdomen Skinfold |
|----------------------------|------------------------------|---|
| COMPLETE | 9.63 | 5.43 |
| NORMAL BOYS 8-14 | 6.81 | 3.58 |
| NORMAL GIRLS 8-14 | 14.18 | 5.82 |
| DEAF & DUMB BOYS 8-14 | 5.78 | 2.70 |
| DEAF & DUMB GIRLS 8-14 | 11.76 | 4.04 |
| NORMAL BOYS 08 YEARS | 4.724 | 1.86 |
| NORMAL BOYS 09 YEARS | 6.644 | 3.33 |
| NORMAL BOYS 10 YEARS | 5.256 | 2.06 |
| NORMAL BOYS 11 YEARS | 8.08 | 5.11 |
| NORMAL BOYS 12 YEARS | 6.476 | 2.61 |
| NORMAL BOYS 13 YEARS | 8.388 | 4.74 |
| NORMAL BOYS 14 YEARS | 8.14 | 2.29 |
| NORMAL GIRLS 08 YEARS | 11.028 | 3.76 |
| NORMAL GIRLS 09 YEARS | 13.14 | 6.73 |
| NORMAL GIRLS 10 YEARS | 11.764 | 4.14 |
| NORMAL GIRLS 11 YEARS | 14.396 | 4.69 |
| NORMAL GIRLS 12 YEARS | 15.416 | 5.27 |
| NORMAL GIRLS 13 YEARS | 16.328 | 7.71 |
| NORMAL GIRLS 14 YEARS | 17.244 | 5.13 |
| DEAF & DUMB BOYS 08 YEARS | 5.828 | 1.12 |
| DEAF & DUMB BOYS 09 YEARS | 4.54 | 1.79 |
| DEAF & DUMB BOYS 10 YEARS | 5.24 | 1.63 |
| DEAF & DUMB BOYS 11 YEARS | 6.44 | 1.76 |
| DEAF & DUMB BOYS 12 YEARS | 4 | 1.18 |
| DEAF & DUMB BOYS 13 YEARS | 6.368 | 2.45 |
| DEAF & DUMB BOYS 14 YEARS | 8.06 | 4.87 |
| DEAF & DUMB GIRLS 08 YEARS | 9.76 | 1.18 |
| DEAF & DUMB GIRLS 09 YEARS | 8.708 | 3.41 |
| DEAF & DUMB GIRLS 10 YEARS | 10.928 | 3.34 |
| DEAF & DUMB GIRLS 11 YEARS | 11.496 | 3.91 |
| DEAF & DUMB GIRLS 12 YEARS | 12.576 | 2.14 |
| DEAF & DUMB GIRLS 13 YEARS | 13.808 | 4.31 |
| DEAF & DUMB GIRLS 14 YEARS | 15.072 | 4.95 |

Table no. 2: T- Test Results comparison of body composition between normal and deaf-dumb children between 8 to 14 years

| Category | Abdomen Skinfold |
|-----------------|-------------------------|
| NB-DDB-8 | 0.01 |
| NB-DDB-9 | 0.007 |

| | |
|-----------|-------|
| NB-DDB-10 | 0.97 |
| NB-DDB-11 | 0.13 |
| NB-DDB-12 | 0.852 |
| NB-DDB-13 | 0.06 |
| NB-DDB-14 | 0.94 |
| NG-DDG-8 | 0.11 |
| NG-DDG-9 | 0.005 |
| NG-DDG-10 | 0.43 |
| NG-DDG-11 | 0.02 |
| NG-DDG-12 | 0.01 |
| NG-DDG-13 | 0.16 |
| NG-DDG-14 | 0.13 |

Table 3: Showing the comparison of the mean scores and ‘t’ value of the **Normal Boys and Deaf-dumb boys 08 years** for the ABDOMEN SKINFOLD

| Variables | Groups | N | Mean | Standard Deviation | Mean Difference | Obtained Value ‘t’ | Df | Table Value of ‘t’ | Comments |
|------------------|--------|----|-------|--------------------|-----------------|--------------------|----|--------------------|----------------------|
| ABDOMEN SKINFOLD | NB-08 | 25 | 4.724 | 1.866 | 1.104 | 0.01 | 48 | 2.02 | <i>Insignificant</i> |
| | DDB-08 | 25 | 5.828 | 1.124 | | | | | |

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Boys of 08 years is 4.724 with standard deviation (1.866) and Deaf-dumb boys is 5.828 with standard deviation (1.124) and the obtained ‘t’ value is 0.01 at 48 degree of freedom with the table ‘t’ value is 2.02 at .05 level of significance found to be insignificant

Table 4: Showing the comparison of the mean scores and ‘t’ value of the **Normal Boys and Deaf-dumb boys 09 years** for the ABDOMEN SKINFOLD

| Variables | Groups | N | Mean | Standard Deviation | Mean Difference | Obtained Value ‘t’ | Df | Table Value of ‘t’ | Comments |
|-----------|--------|----|-------|--------------------|-----------------|--------------------|----|--------------------|----------------------|
| ABDOMEN | NB-09 | 25 | 6.644 | 3.33 | 2.104 | 0.007 | 48 | 2.02 | <i>Insignificant</i> |

| | | | | | | | | | |
|----------|--------|----|------|------|--|--|--|--|--|
| SKINFOLD | DDB-09 | 25 | 4.54 | 1.79 | | | | | |
|----------|--------|----|------|------|--|--|--|--|--|

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Boys of 09 years is 6.644 with standard deviation (3.33) and Deaf-dumb boys is 4.54 with standard deviation (1.79) and the obtained 't' value is 0.007 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 5: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the ABDOMEN SKINFOLD

| Variables | Groups | N | Mean | Standard Deviation | Mean Difference | Obtained Value 't' | Df | Table Value of 't' | Comments |
|------------------|--------|----|-------|--------------------|-----------------|--------------------|----|--------------------|----------------------|
| ABDOMEN SKINFOLD | NB-10 | 25 | 5.256 | 2.06 | 0.16 | 0.97 | 48 | 2.02 | <i>Insignificant</i> |
| | DDB-10 | 25 | 5.24 | 1.63 | | | | | |

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Boys of 10 years is 5.256 with standard deviation (2.06) and Deaf-dumb boys is 5.24 with standard deviation (1.63) and the obtained 't' value is 0.97 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 6: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the ABDOMEN SKINFOLD

| Variables | Groups | N | Mean | Standard Deviation | Mean Difference | Obtained Value 't' | Df | Table Value of 't' | Comments |
|------------------|--------|----|------|--------------------|-----------------|--------------------|----|--------------------|----------------------|
| ABDOMEN SKINFOLD | NB-11 | 25 | 8.08 | 5.11 | 2.64 | 0.13 | 48 | 2.02 | <i>Insignificant</i> |
| | DDB-11 | 25 | 6.44 | 1.76 | | | | | |

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Boys of 11 years is 8.08 with standard deviation (5.11) and Deaf-dumb boys is 6.44 with standard deviation (1.76) and the obtained 't' value is 0.13 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 7: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the ABDOMEN SKINFOLD

| Variables | Groups | N | Mean | Standard Deviation | Mean Difference | Obtained Value 't' | Df | Table Value of 't' | Comments |
|------------------|--------|----|-------|--------------------|-----------------|--------------------|----|--------------------|----------------------|
| ABDOMEN SKINFOLD | NB-12 | 25 | 6.476 | 2.61 | 2.476 | 0.852 | 48 | 2.02 | <i>Insignificant</i> |
| | DDB-12 | 25 | 4.0 | 1.18 | | | | | |

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Boys of 12 years is 6.476 with standard deviation (2.61) and Deaf-dumb boys is 4.0 with standard deviation (1.18) and the obtained 't' value is 0.852 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 8: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the ABDOMEN SKINFOLD

| Variables | Groups | N | Mean | Standard Deviation | Mean Difference | Obtained Value 't' | Df | Table Value of 't' | Comments |
|------------------|--------|----|-------|--------------------|-----------------|--------------------|----|--------------------|----------------------|
| ABDOMEN SKINFOLD | NB-13 | 25 | 8.388 | 4.74 | 2.020 | 0.06 | 48 | 2.02 | <i>Insignificant</i> |
| | DDB-13 | 25 | 6.368 | 2.45 | | | | | |

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Boys of 13 years is 8.388 with standard deviation (4.74) and Deaf-dumb boys is 6.368 with standard deviation (2.45)

and the obtained 't' value is 0.06 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 9: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the ABDOMEN SKINFOLD

| Variables | Groups | N | Mean | Standard Deviation | Mean Difference | Obtained Value 't' | Df | Table Value of 't' | Comments |
|------------------|--------|----|------|--------------------|-----------------|--------------------|----|--------------------|----------------------|
| ABDOMEN SKINFOLD | NB-14 | 25 | 8.14 | 2.29 | 0.08 | 0.94 | 48 | 2.02 | <i>Insignificant</i> |
| | DDB-14 | 25 | 8.06 | 4.87 | | | | | |

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Boys of 14 years is 8.14 with standard deviation (2.29) and Deaf-dumb boys is 8.06 with standard deviation (4.87) and the obtained 't' value is 0.94 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

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