

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

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ABSTRACT

A comparative study of development of Metabolic Rate 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 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 Canadian Fit Test for Metabolic Rate and the same subjects were exposed to the same tests after exactly one year without any formal sports training and the development in their Metabolic Rate was noted. After the statistical treatment of data by utilizing 't' test the following findings were noted: An uneven distribution of development in metabolic rate is observed in deaf dumb girls and normal girls. The reduction in metabolism is observed after 11th till 14th year in normal and deaf dumb girls.

INTRODUCTION:

Today's education is not merely a vast sea of mental acrobatics but also a source of physical activity that leads to all round perfection of an individual. Modern thinkers in education, now a day, emphasize that the best individual is one who is physically fit, mentally sound and sharp, emotionally balanced and socially well adjusted and as a result the birth of physical education is witnessed. The broad objectives of physical education are physical development, motor development, mental development and social development.

The three major structural components of the human body include muscle, fat and bone. Because there are marked gender differences in body composition, a convenient basis for evaluation and comparison is to employ the concept proposed by Behnke of the reference man and reference woman. The theoretical model is based on the average physical dimensions obtained from detailed measurements of thousands of individuals from large-scale anthropometric survey. The reference man is taller, heavier, his skeleton weighs more, and he has a larger muscle mass and lower total fat content than the reference female.

Growth and development is a lifelong process. Each and every aspect of human being is subject to the process of growth and development. In sports we consider physical and physiological aspects, psychological and social aspects and motor development aspects. Physical and physiological development is the most important aspect of growth and development for sports and physical education. It covers the development of height, weight, sitting height, various muscle girths, diameter of bones at different joints, fat percentage which are directly or indirectly

related to motor abilities, sports skills, tactical efficiencies, motor performance and motor behavior, which are again the prerequisites of sports performance.

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 and dumb and bring them to equal stature with normal is the prime aim of the researcher.

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 challenged 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 Metabolic Rate among the deaf dumb and compare with the normal, which is a performance prerequisite.

OBJECTIVES OF THE STUDY:

1. To find out, access and analyze the developments taking in Metabolic Rate 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 Metabolic Rate 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 STUDY:

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 Metabolic Rate for physically challenged children in specific age group.
3. Results may also be helped to enhance sports terminology communication skills with physically challenged children.
4. Evaluation of development of Metabolic Rate may fetch platform for establishing training methodology for enhancing performance in specific sports.
5. The comparison of development of Metabolic Rate will give clear picture of the positive and negative aspects of 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.

METABOLIC RATE:

The term intermediary metabolism refers to the vast web of interconnected chemical reactions by which all the cell's constituents, many rarely found outside it, are created and destroyed. Anabolic reactions use energy to build complex molecules from simpler organic compounds (e.g., proteins from amino acids, carbohydrates from sugars, fats from fatty acids and glycerol); catabolic reactions break complex molecules down into simpler ones, releasing chemical energy. For most organisms, the energy comes ultimately from the Sun, whether they obtain it by photosynthesis and store it in organic compounds or by consuming those organisms that do so. In some bacteria in special environments such as deep-sea vents, the energy comes from chemical reactions instead. Energy is transferred within the cell and the organism by ATP; anabolic reactions consume it, and catabolic reactions generate it. Every cellular chemical reaction is mediated by a specific enzyme. The process that breaks down a substance is usually not the reverse of the process that makes it, using a different enzyme. *See also* digestion; fermentation; glycolysis; tricarboxylic acid cycle.

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 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 children.

* 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 functions.

* 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 indicated that with consistent and sophisticated teaching, some kinds of motor competencies may be accelerated during early childhood.

* A study by Walters, present 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 from 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 motor 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 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 test in **endurance** and its complex forms for evaluation. The tests were administered individually under standard conditions applicable for specific tests and the time period required between two tests is amply considered.

VARIABLES:

Dependent Variables: (1) Normal girls. (2) Deaf Dumb girls.

Independent Variables: Development of Metabolic Rate.

Inter-weaning Variable: Age groups (8, 9, 10, 11, 12, 13 & 14)

TOOLS AND MEANS:

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

Metabolic Rate: (1) Canadian Fit Test (20 meters shuttle run).

PROCEDURE:

The subjects were selected from different schools in normal category (girls) and deaf dumb schools (girls). In all 01 test was selected for evaluating the development of Metabolic Rate 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 conditions of the subjects were 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 hypothesis for the difference between various sample means the t test is used at significance of .05 levels.
- (3) For testing the hypothesis for the difference between various sample means the f test is used at significance of .05 levels.

RESULTS AND DISCUSSIONS:

An uneven distribution of development in metabolic rate is observed in deaf dumb girls and normal girls. The reduction in metabolic rate is observed after 11th till 14th year in normal and deaf dumb girls.

RESULTS OF THE COMPARISON OF THE DEVELOPMENT OF METABOLIC RATE OF GIRLS (NORMAL AND DEAF-DUMB) BETWEEN 8 YEARS TO 14 YEARS (CANADIAN FIT TEST)

Normal girls:

1. The maximum mean of development of metabolic rate in normal girls was found at the age of 13th year, which is -0.38 and the minimum at 8th year, which is -0.068. The average mean of development of metabolic rate in normal girls between 8 to 14 years is found to be -0.238.
2. The standard deviation of development of metabolic rate in normal girls is found maximum at the age of 10th year, which is 0.55 and minimum at the age of 11th year, which is 0.365. The average standard deviation of development of metabolic rate in normal girls between 8 to 14 years is found to be 0.43.
3. The correlation of development of metabolic rate in normal girls between 8 to 14 years of age groups is found as high as 0.89.

Deaf-dumb girls:

1. The maximum mean of development of metabolic rate in deaf-dumb girls was found at the age of 14th year, which is -0.448 and the minimum at 13th years, which is -0.148. The average mean of development of metabolic rate in deaf-dumb girls between 8 to 14 years is found to be -0.26.

2. The standard deviation of development of metabolic rate in deaf-dumb girls is found maximum at the age of 14th year, which is 0.56 and minimum at the age of 9th year, which is 0.31. The average standard deviation of development of metabolic rate in deaf-dumb girls between 8 to 14 years is found to be 0.38.
3. The correlation of development of metabolic rate in deaf-dumb girls between 8 to 14 years of age groups is found as high as 0.91.

COMPARISON OF GIRLS (Normal and deaf-dumb):

The average mean of development of metabolic rate of normal girls between 8 to 14 years is -0.23, which is more to -0.26 of the deaf-dumb girls between 8 to 14 years. The difference of mean of development of metabolic rate between normal girls and that in the deaf-dumb girls is -0.03, which is insignificant. The maximum mean of development of metabolic rate in normal girls is found at the age of 13th year, which is -0.38 and that in the deaf-dumb girls it is at the age of 14th year, which is -0.44.

Table No. IV.1: evaluation of significance of development of metabolic rate 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	0.182	0.454	Insignificant
09 NG & DDG	0.256	0.109	Insignificant
10 NG & DDG	0.292	0.019	Insignificant
11 NG & DDG	0.392	0.300	insignificant
12 NG & DDG	0.335	0.068	Insignificant
13 NG & DDG	0.030	0.572	Insignificant
14 NG & DDG	0.049	0.037	insignificant

* Significant at 0.05 level.

MEAN VALUES AND COMPARISON OF THE CATEGORY OF SUBJECTS: GIRLS (N & DD)	METABOLIC RATE INITIAL	METABOLIC RATE FINAL	METABOLIC RATE DEVELOPMENT
NORMAL GIRLS 08 YEARS	15.28	15.212	-0.068
DEAF & DUMB GIRLS 08 YEARS	14.868	14.708	-0.16
NORMAL GIRLS 09 YEARS	13.824	13.596	-0.228
DEAF & DUMB GIRLS 09 YEARS	13.764	13.464	-0.3
NORMAL GIRLS 10 YEARS	13.444	13.2	-0.244
DEAF & DUMB GIRLS 10 YEARS	13.936	13.62	-0.316
NORMAL GIRLS 11 YEARS	13.016	12.8	-0.216

DEAF & DUMB GIRLS 11 YEARS	13.908	13.724	-0.184
NORMAL GIRLS 12 YEARS	13.352	13.036	-0.316
DEAF & DUMB GIRLS 12 YEARS	13.404	13.14	-0.264
NORMAL GIRLS 13 YEARS	12.252	11.872	-0.38
DEAF & DUMB GIRLS 13 YEARS	12.648	12.5	-0.148
NORMAL GIRLS 14 YEARS	11.756	11.536	-0.22
DEAF & DUMB GIRLS 14 YEARS	12.416	11.968	-0.448

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