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Minor Research Project

“A Comparative Study of Body Composition among Normal and Deaf-Dumb Children between 8 to 14 Years”

BY

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2010-2013

DEDICATED TO MY PARENTS

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CERTIFICATE

This is to certify that the work embodied in this Minor Research Project entitled, **"A Comparative Study of Body Composition among Normal and Deaf-Dumb Children between 8 to 14 Years"** has been carried out by **Dr. Shatrunjay M. Kote**, during the years 2010 to 2013. The work included in this study is original. References made to the work of others have been cited in the text.

Dr. Pradeep B. Dube,
Principal,
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Place: Aurangabad
Date: June 2015.

DECLARATION

I hereby declare that the present work completed in the form of Minor Research Project entitled, **"A Comparative Study of Body Composition among Normal and Deaf-Dumb Children between 8 to 14 Years",** is an original work carried during 2010 to 2013.

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CHAPTER – I

INTRODUCTION

I.1 (A) - HISTORICAL BACKGROUND:

The modern age is an age of space, adventurism and technological gigantisms. Machines, which men built up for the purpose of adding comforts to his life, have become part and parcel of life. Biological discoveries have opened new casements of knowledge about human organism emphasizing that there has certainly been reduction in human physical efficiency since the time he started depending on machine. For man there is nothing more beautiful and valuable than his physique. The proper use of body is essentially necessary if humans wish to grow and develop to their optimal level. 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.

For obvious reasons we do not know anything about athletic activities during the Stone Age. People probably liked games and plays, and they sang and danced. There is definite evidence in sculptures and paintings some 5000 years old that Egyptians exercised. There is an historical record of the ancient games beginning in Olympia in the Western Peloponnesus, Greece, in 776 BC. Thereafter, they were held at 4-year intervals, until AD 394 when they were abolished. The earlier Olympic programs consisted almost exclusively of exercises of the Spartan type, testing endurance and strength with a special view to war. Olympia became an expression of the Greek ideas that the body of man as well as his intellect and spirit has a glory, that the body and mind should alike be disciplined, and that it is by the harmonious discipline of both that men best honour Zeus[1].

India was not a major influence in the development of western civilization, but it represents an important civilization that is almost as ancient as China's. India was invaded and largely taken over by an Aryan people around 1500 to 1200 B.C. the primary religion was Hinduism, which was also a social system and thus a factor of importance in the development of Indian civilization. The caste system within this religion eventually became very rigid and severely limited the flexibility of Indian society. The people were divided by the system into castes, or social classes. Because they could not move either upward or downward in caste, their positions in life were unchanging. The primary aim of a person under Hinduism was to be virtuous. Asceticism, which was also stressed by the religion, could take almost any form from a simple moderation of the wants of the individual to self-torture (only occasionally) depending on the strength and direction of the persons religious views. Education was based upon a person's caste, for the castes dictated the type of occupation the members could follow, even though the occupation might not have any relationship to a person's talents or abilities. No stress was put upon individuality; emphasis was placed on the future life. The Hindus believed in reincarnation-that is, in the soul of the person returning to earth after the body's death to inhabit another body, which might be human or animal depending upon how well that person's previous life was lived. There was little interest in physical education, though there were some recreational sports and games and some dances that were used for ceremonies and religious observances. Some physical training was necessarily provided for members of the military, who entertained themselves with hunting activities when there was no war. Physical exercises were sometimes used to promote health, but the care or exercises of the body were not major concerns of Hinduism.

Physical activities of the children of a society are the reflection of its culture. However, Fragmentation of India could not promote a composite culture and physical activities for the children mainly due to lack of organized educational system. Thanks to the British that the country was brought under one rule, thereby paving the way for unification and integration of land and culture. The British rulers not only provided organized education system but also introduced their cultural activities. Their efforts to curb the surge of Indian culture provided a new range of activities called developmental activities. As independence dawned on India in 1947, there were fervor efforts to project a new image of India by adopting whatever is latest. In the

field of child education too major thrust was directed to development of modern games than developmental games. However, this effort failed and we are where we were in 1947. Physical education starts from very birth of a child. The very moment it comes into being, it begins to cry and move its limbs. Thus is necessary for its very survival. The parents are its first physical instructors. It is they who instructs it how to work, run, jump or leap. In older times, it was they who first taught it how to climb a tree, use bow and arrow, a spear or swim or catch a fish. These were its main physical activities.

MEANING OF EDUCATION According to Prof. Drever, Education is a process in which and by which knowledge, character and behavior of the young are shaped and moulded. According to John Dewey, Education is a process different from the process of preparation for future life. It is a gradual repletion of experiences and feelings. The instructions and knowledge given in schools is known as education by the ordinary people. In this process, teachers impart knowledge to students with specific aims. Here teacher dominates the scene and learners are only passive listeners who receive only what is given to them. When the process is over, they receive the certificate of pass or fail at the end of the year or course. This concept of education is very narrow in the sense that it is only the communication of information by the teacher and acquisition of knowledge by students. Here no emphasis is given on all round development of Childs personality. As a result, this type of education fails to prepare a child capable of facing future challenges and hardships.

PHYSICAL EDUCATION Physical education has been defined by different authorities at different times in a variety of ways. According to Edward hitch cock, “physical education” as understood is a cultivation of power and capabilities of students as will enable him to maintain his bodily condition in the best working order intellectual and spiritual life”. According to Dundley Allen sergents and to give them as much health, strength and stamina as possible to enable them to perform the duties that await them after they leave their college”. Form the above definitions, it can be inferred that in physical education, the greatest stress is laid on the development of big and strong muscles. The programmes are to be elective and selective. An individual has to participate in these programmes to get any benefit. Physical education should enable effective use of body, mind intellect and soul. All the activities of a human being –physical, mental, intellectual, social, economic and

political are inter-related and physical education helps greatly in the evolution of a whole man. Physical education is the only process which helps every aspect of life. Physical education is quite natural. It does not come in the way of education. The aim and goal of physical education is very broad based. It does not touch only its physical well-being. It should benefit the whole individual and he should be in a position to promote well-being of the society. It should increase physical, mental and intellectual capabilities for benefit of the society. It should help him in developing the quality of leadership. Physical education involves the process of acting in a particular way. The purpose is closely linked with its aim and includes determination, courage, bravery, and change in behavior and alteration in life style. It is enjoyable and various patterns of exercises fulfill various needs which go no changing in a fast changing world.

PHYSICAL FITNESS AND HEALTH Over the decades, the society in general has realized the need for keeping fit and healthy through organized physical activity programmes. Scientific evidence from biological science has made it clear that unless man engages himself in organized vigorous physical activity programmes the real benefits would not come. According to Morehouse and Gross, (1975) health fitness and performance are three separate and poorly correlated phenomena. Health is generally defined as the freedom from disease. Fitness strictly relates to a man's ability to meet the demands of his environment. A person can be healthy without being fit. He can be in poor health and perform superbly. Sick athletes break records all the time. Every Olympic Competition is populated by athletes with cold, fever, infection and diarrhea. They invariably compete, and perform to their level. If health is defined as a disease free condition, then fitness is not health. Only when the definition of health includes functional wellness – meaning the ability to cope with his environment health, fitness and performance go together. Physical fitness is highly influenced by human health. A nation's true wealth lies not in its lands and waters, not in its forests and mines, not in its flocks and herds, not in its dollars but in its healthy and happy men, women and children. Many researchers strongly support that regular exercise helps one to keep a strong and healthy heart and prevent cardio vascular diseases. A physically fit heart beats at a lower rate and pumps more blood per beat at rest. As a result of regular exercise, an individual's capacity to use oxygen is increased substantially. Energy production depends on internal chemical process or metabolic changes. Human body is one of the most beautiful as well as the most

complicated systems that God has created. The intelligent ways with which this unique creation acts, reacts and interacts is a rare phenomenon. Not only should it look out-worldly 'beautiful' but also 'work' efficiently to enable man to achieve the ultimate goal of life. Neglect of the body leads to decay, disintegration and destruction whereas its proper care enables a man "to live most and cherish best". 5 Adequate nutrition and proper exercise are two wings of achieving and maintaining fitness. Bob Anderson writes, "If you don't find time to exercise you'd better find time to be sick". Physical inactivity, improper eating habits and obesity are inter-related factors that give rise to serious health problem. The principles of good nutrition for the athlete are the same as for all persons, to eat a variety of food – meat, milk, eggs, cheese, fish, fruits, vegetables, cereals and bread – every day and to maintain weight at the desired level. The human body works exactly like an engine. It obeys the laws of Physics, principally the law of Conservation of Energy. The energy that translates into work must first enter the body as food. When a person uses more energy than he receives in caloric food content, he loses weight. It is a physical principle. On the other hand, when a person takes in more caloric food content than he expends in energy, he gains weight. The average size adults eat about 2,400 calories a day (Morehouse and Leonard Gross). The youth of our nation are affected particularly by the existence of push button gadgets and other devices tending towards habits of inactivity. The school, colleges and homes need to compensate for this immobility imposed upon our children by increased mechanization and material wealth. Individual who is physically fit has a well proportionate and well developed body and the posture is usually good.

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 Kabaddiplayers and arm reach is an asset to the reach the touch line and boxer (Reilly, et al. 1990).

The research carried out by Quetlet (1870) to obtain the measurement of the average man according to Gauss Law had the objective of discovering the ideal, harmonious proportions for each body section and marked the beginning of anthropometry, a branch of anthropology which studies the measurable characteristics of mechanical (morphological, physiological and pathological). Research in this field was continued by a number of scientists including Ricver (1890) who was the first to use Calipers, Oeder (1910) who used the umbilical fold as measurement of obesity, Matiegka who worked out a series of equations for predicting the values for muscle mass, frame size, body lipids desired from structure and the circumference and with

of the folds. When we speak literally anthropometry is the measurement of human body, discover its exact dimensions and proportions of its parts. Anthropometry constitutes the earlier form of measurement in physical education study of the human body (Physique) and its proportion began many centuries ago. Anthropometric measurement was the full type of testing used it physical education in the world. So separate measurements were recommended by the American Association for the advancement of physical education. Anthropometric measurement may be useful in choosing the descriptive for individual since, it is very essential for enhanced performance. For example, longer legs and longer hands are helpful to shoot in Basketball. Long limbs help to clear the hurdles easily.Almost all the sports and games tall structure can be a better performance especially in volley ball, basketball, high jump, pole vault, hurdles, etc. The modern world analyses the athletes through computer. This is possible only through body measurement. The anthropometry examination can be administered by trained persons who can aid the health administer in appropriate follow ups. The earliest research was in the area of anthropometry with the emphasis on changes in muscle size brought about through exercises. It was also an early type of testing in physical education. On the theory that exercise should be prescribed to affect muscle size emphasis was placed upon muscle symmetry and proportion. In the year Hit Chock and Sargent (1861), produced profile charts to reveal how individuals compared with their standards. Sargent chart continued 44 anthropometric measurements as well as number of strength tests. Fifty such tests were recommended by the American Association for the Advance of Physical Education (AAHPER). Height has the potential placement as a preferable pre-requisite for the performance excellence in many sports or games. Anthropometric measurements have revealed correlation between body structure and physical characteristics and sports capabilities. The physical structure especially the Height, Weight and arm length have definite decisive advantage in many games and sports. Similarly segmental length of individual body parts especially the leg length, and arm length are at considerable advantage in certain athletic events. Human motor performance is a composite of many variables one of which is structure of the body, the specific measurement of limb length, circumference chest and build indices can reveal the relationship between anthropometry of the athlete and his motor fitness measurement of body size includes such descriptive information as Height, Weight and circumference of various body segments. It has been found that top athletes are

some sport tends to have those proportions that bio – mechanically aid the particular performance required. For this study Height, Weight, chest, arm length, hip, thigh and calf were chosen as anthropometric parameters (Zeigler and Earle, 1982). Height is a vertical measurement from the heel to vertical of skull of the human body. Height of the player is advantage for the game like basketball, volley ball and high jumpers because they can easily reach the maximum Height (Hornby and Parnwell, 1962). Weight is the measurement of total body mass. It is measured by weighting machine. Weight of the player is advantage for the game like wrestling, shot put, hammer throw because those persons can use the Weight easily (Hornby and Parnwell, 1962).

Body Mass Index (BMI) is calculated (in Kg/m2) by dividing body Weight (in Kg) by the square of Height (in m). BMI standards are used to classify obesity and to assess disease risk. As BMI increases, mortality rate from cardiovascular disease and diabetes increases as well (Bray and Gray, 1988). A problem with the BMI is that it does not differentiate between lean body mass and fat mass. As a result is not appropriate to use with an athletic population. Skinfold measurement is a popular assessment of body composition. It takes significantly less time to complete than hydrostatic weighing, DEXA, or ADP. The principle behind skinfold measurement is that subcutaneous fat is proportional to total body fat. By measuring the skinfold thickness at various sites on the body, Percent Body Fatcan be calculated through a regression equation. Because the proportion of subcutaneous fat to total-body fat varies according to age, gender, and ethnicity (Lohman, 1981), the appropriate regression equation must be selected. Regression equations also vary in the number of skinfold site needed. Even when the appropriate regression equation is used, there may be a 3% to 4% error in the calculated Percent Body Fat (Lohman, 1981). Thus, the correct regression equation must be carefully selected.

Motor development objectives are concerned with making physical movements, useful with as little expenditure of energy as possible. The term motor is derived from the relationship of a nerve or nerve fibre to the one that connects the Central Nervous System with muscles through their convections the movements' results. Effective motor movement can only results if there is harmonious working of the muscular and the nervous system. It helps in keeping a greater distance between fatigue and peak performance. The activities that involve hanging, jumping, dodging,

leaping, kicking, bending, throwing will enable a person to perform his daily work much effectively without reaching a point of wearing out, so quickly[2, 3].

Data obtained at the beginning of the century revealed that children, as they age, evidence various patterns of physical growth as well as skeletal maturity. These differences at times can cause rather dramatic changes in motor ability and in athletic performance. This type of investigation was stimulated by the use of X-rays to determine skeletal maturity, a practice expanded during the time between the two Worlds Wars, and manifested in the publication of various atlases of maturation.

More recent evidence suggests that marked ethnic differences exist in motor development at birth and during the first year or two of life. In general, it has been a consistent finding that infants from the so-called pre-industrial societies exhibit precocious motor development, when compared to similar indices obtained from children born within the more advanced industrialized societies.

The words maturation and development usually refer to various kinds of qualitative changes in the infants, children, and young adolescent. These changes mean that the organism is becoming more complex, differentiated as to function, and able to perform increasingly complex tasks. Growth, on the other hand, refers to less subtle, more measurable quantitative changes in the child. For this reason, human growth has been the subject of many of the earlier studies of those interested in the manner in which children grow and change. The norms that have emerged from these studies are not always helpful because of the small number of children who have been measured, or perhaps because of the relatively limited sample in terms of sex and ethnic and / or socioeconomic background.

For the most part, the growth rate of the average infant is extremely rapid during the first year and a half of life. One obtains a very different picture of physical growth when one looks at an individual child compared to simple linear plotting of studies in which large numbers of children have been measured. The individual child is a product of the genes of the parents and of their parents, and of subtle “genetic programming” which is just now beginning to be studied. Various other factors, including the opportunity to play and encouragement by parents in physical efforts, add further complexity to the “picture” of growth. A single child may, for example, evidence the relatively steady growth rate typical of the charts emanating from group

studies. He or she may evidence relatively rapid early growth in childhood and a later "levelling off" still another pattern of growth may include a slow start, followed by a marked change in late childhood. An even more complicated pattern may include changes in size that show stops and starts during the period of time from the fifth year to puberty.

A direct result of the Kraus-Weber tests was the establishment of the president's council on youth fitness in 1956 under President Eisenhower. The AAHPER (American Alliance for Health Physical Education and Recreation) appointed a special committee, chaired by the late Paul Hun sicker of the University of Michigan that developed the AAHPER Youth Fitness Tests in 1957. Revisions of the test have been published in 1965 and 1975. It is undoubtedly the most idle used fitness test in United States. The AAHPER Youth Fitness Test has been officially adopted by the president's council on physical Fitness and Sports. The President's Physical Fitness Award has been established as a motivational technique and is distributed to all boys and girls who achieve the 85^{th} percentile or better on all the tests. The test manual is available from AAHPER in Washington D. C. (1976). The AAHPER Youth Fitness Test is currently under revision. The items on the new revision will emphasize health-related fitness. The four items will include: Sit-up test; sit-and-reach flexibility test; a test of cardio respiratory function (9 minute or 1 mile run); and body composition measures (skin folds).

I.1 (B) - GENETIC BACKGROUND:

At the end of the first year of age, children usually begin to walk. Their motor behavior undergoes marked changed during this time and as they enter the second year they begin to show a number of variations in locomotor activities: they will usually begin to jump, to run and to hop. At the same time they show the beginnings of skills that will later be developed to high levels in childhood and adolescence. During the second year, they begin to handle play equipment and balls if they are made available.

During the third and fourth years, they will usually begin to manifest social interactions at play and variety of individual differences modifies the manner in which they move. The obese child of nursery school age performs in a different manner from his thinner peer. Children begin to evidence differences due to the play experiences to

which they are exposed, and several observers have noted both subtle and obvious differences in the manner in which boys and girls appear to move and to perform skills[10].

During this period, children will begin to display various asymmetries in manner in which they move. Hand preferences become apparent, ear and eye preferences are also measurable. The child prefers to hop on one foot consistently and in other ways establish movement characteristics that tend to persist into childhood and adulthood.

Towards the end of the first five years, movements will become more integrated. They may begin to jump with their arms and to throw with the proper weight shift. By the end of the fifth year additional movement capacities will emerge, although they cannot hop rhythmically very well, skipping is not mastered until another year or more passes and abilities to throw accurately and to catch small balls both remain relatively under developed.

Children from 6 to 12 years of age improve to a marked degree in ability to move and to manipulate their environments. Although during this period obvious growth changes occur, the rates of growth begin to subside as children reach their sixth year and do not continue at the rapidity that characterized the first five years of life[8].

More important than growth and body weight changes in the modification of performance during this period of childhood are a number of experiences and situations in which motor skill is demanded. The boys form teams and the girls begin to interact socially in more individualistic games and as both groups each adolescent, they learn to dance.

The motor development of children has been studied from several standpoints by various investigators. Some have come to prefer a single test and have traced the manner in which children improve in its execution as a function of age. Other scholars have devised more competencies of children. The Johnson test, containing tumbling as well as locomotor sub skills, is typical of this kind of tests[15]. Vickers and associates have modified the scoring of the Brace Test, a stunt- type test, for use in the

evaluation of children[16]. The Lincoln Oseretzsky is another battery of test, developed for the evaluation of children; it contains an even greater variety of both fine and goes motor skills to measure[17].

Several factors, which vary in importance depending on the characteristics of the sport, must be considered. Exercise has been demonstrated to be extremely important for normal growth and development of children. The most recent addition to the care team for the handicapped child has been the physical educator, sports coach, or dance teacher with specific skills and an interest in sports and fitness programs for the handicapped.

Hearing and Communication: Until recently, it was believed that all babies were born deaf and that after birth they gradually learned how to listen. However, research has indicated that the ears develop at a gestational age of approximately 4 months and that the foetus is capable of listening to sounds within the womb. Consequently a child is born with a functional hearing system. After birth the baby is capable of hearing and discriminating a variety of sounds although he has a preference for speech sounds which facilitates the natural acquisition of language. The quality of the newborns hearing ability changes and ranges from being able to identify his mother's voice among numerous female voices, to being able to discriminate intonation patterns and interpret friendly versus unfriendly voices. The infants hearing progresses from listening to auditory input in general to being able to listen to finer auditory detail. At approximately ten months of age the infant is able to respond appropriately to a variety of speech commands. At age 12 months the infant starts using single words which he expands to form two word sentences by the age of 2 years. Although the child is born with the ability to acquire language it is paramount that he is repeatedly exposed to and experiences sound, in the absence of which, language acquisition will not develop. During the first 4 years of his life the child is very receptive to the sounds of language. If during this stage the child was not exposed to or did not experience sound it is highly unlikely that he will acquire language skills. Initially the child's experiences with sound form the foundation of the language learning process. Meaning is attached to the sound experience as the child is exposed to language by hearing the speaker and in so doing develops an innate concept of language, which is stored in the brain. The child uses this innate language ability to speak, read and write. Hearing facilitates listening which in turn is a pre-

requisite for the acquisition of spoken language. When the child becomes a speaker the hearing system serves to monitor his voice and language use[42].

Types of hearing loss:

(1) Conductive hearing loss: Loss of sound sensitivity as a result of abnormalities of the external and middle ear. The conduction of the sound by means of air conduction through the external or middle ear mechanism is weakened by an abnormality. The conduction of sound by means of bone conduction is not affected.

(2) Sensory-Neural hearing loss: Loss of sound sensitivity as a result of abnormalities in the inner ear (e.g. cochlea) or nerve pathways (e.g. eighth nerve).

(3) Mixed hearing loss: Loss of sound sensitivity as a result of abnormalities in both the conductive and sensory-neural mechanisms.

Causes of hearing loss: Hugo, 1987 lists the following as possible causes of hearing loss:

(1) Congenital: The majority of people have the ability to hear. This ability is a generic trait. Some people do not have this trait. Instead, they have a trait for deafness or hearing impairment. The cause of deafness may be traced to either parent. Congenital hearing impairment is transmitted either by ordinary, paired chromosomes (Autosomal) or by the sex chromosomes (x-linked). (a) Autosomal dominant inheritance: In this condition there is at least one dominant gene for hearing loss in one of the ordinary chromosomes. Possession of a single dominant gene is enough to cause the trait. A hearing impaired parent in this instance will have one normal gene and one gene for hearing loss and will transmit either a gene for hearing loss or a gene for normal hearing to his child. Typically for each pregnancy the chances for the child to have the trait are about 50%. Males and females are equally affected. The trait is carried vertically from one generation to the next. (b) Autosomal recessive inheritance: In recessive hearing impairment the gene for hearing loss is recessive to the gene for normal hearing. Parents of children with Autosomal inheritance usually have normal hearing. Parents of children with Autosomal inheritance usually have one gene for normal hearing and one gene for hearing loss. If both parents are carriers the probability is only 25% that the child will receive the defective gene from each parent and exhibit a hearing loss. (c) X-linked inheritance: X-linked inheritance is a special

type of recessive inheritance. In its most common form, the mother carries the gene for x-linked hearing loss on one of her chromosomes. Because x-linked traits are often recessive the matching gene on the x-chromosome usually allows for normal hearing. The mother would have normal hearing but each son would have a 50% possibility of inheritance of a hearing loss. Each daughter has a 50% chance of inheriting the affected chromosome if the mother is a carrier. She also has a 50% chance of being a carrier of the x-linked trait. In other words she is capable of transmitting the trait to her sons. An affected male will transmit the x-linked trait for hearing loss to all his daughters, making them carriers, but to none of his sons, since he can contribute only y-chromosomes to them.

(2) Acquired: The first 28 days of fetal life form a crucial time of very rapid fetal growth and development during which more than 70% of long term neurological handicaps originate. A significant portion of these handicaps appear to begin with fetal infection acquired during pregnancy or in the period immediately before or after birth. (a) Pre-natal: Fetal infection occurs by one of the following routes: Trans-placental passage of virus. Extension of the birth canal with infection of the membranes. Direct contact or contamination during the birth process: Rubella, Cytomegalovirus, Kernicterus, Rh incompatibility. (b) Peri-natal: Prematurity, Anoxia, Birth injury. (c) Post natal: Meningitis, Measles, Mumps, Other viral infections including Chicken Pox, Ototoxity, Otitis media.

(3) Trauma: head injury, noise induced.

Implications of a hearing loss: The ear is the primary sensory channel through which speech and language skills are normally acquired. Hearing loss in an infant or young child is associated with a broad spectrum of problems:

(1) Effects on speech development: Speech is a complex signal, with most of the speech information carried in the frequency range between 400 – 3000 Hz[30, 31, 32]. In order to perceive speech adequately the frequencies between 800 –2000 Hz should be audible[33]. The process of speech perception is primarily an auditory one and limited in the child with a profound hearing impairment. Speech sounds usually occur in continuous speech. This complicates the speech perception process and necessitates the utilization of a variety of skills to adequately perceive the speech signal[33, 34, 35, 36, 37, 38, 39]. Firstly the child needs to detect the presence or absence of the speech signal.

Both voicing and vowel information is confined to the lower frequency regions (100 Hz to 250 Hz). This suggests that most hearing impaired children will be able to detect the speech signal since individuals with profound hearing loss tend to have better hearing in the lower frequencies[31, 40]. Detection therefore involves a very limited analysis of the acoustic cues present in the speech signal. Secondly adequate speech perception depends on the ability to discriminate between speech signals of different temporal and spectral cues[34]. If the profoundly hearing impaired child has better hearing sensitivity in the lower frequencies it is predicted that he will be able to differentiate between speech signals differing in duration and stress, for example monosyllabic vs. multi-syllabic words and spondees vs. trochees, as the supra segmental aspects of speech are provided in the lower frequencies. The availability of spectral cues is usually limited in a profoundly hearing impaired child. Therefore phonemes dependent largely on audibility of the second and third formants (high frequencies) may not be easily discriminated, for example, the vowels 'i' and 'u' have similar F1 and F2 formants but different third formants[31, 32]. The vowels 'i' and 'u' are therefore only distinguishable if the individual is able to hear the formant transitions of the first three formants[33, 20, 38, 32]. Thirdly the normal hearing child is able to perceive speech because he is capable of identifying specific phonemes by attaching a linguistic label to what was heard[34]. This skill is often difficult for a profoundly hearing impaired child to acquire as it is dependent on the correct perception of spectral cues in the speech signal. This information is often reduced in a profoundly hearing impaired child who has little if any residual hearing in the high frequencies[40]. Integration of the above mentioned skills, as well as adequate attention and memory, facilitate the total comprehension of the oral message. As the hearing impaired child receives only inadequate acoustic information which may be distorted[30]. He is primarily dependent on linguistic information available in the spoken message comprehension. Good speech perception skills are not only a pre-requisite for comprehension of a spoken message but are also essential for the development of good speech production skills. The normal hearing infant utilizes the above mentioned skills for adequate perception of the speech signal. He then attempts to imitate the sound and is able to monitor his own productions. In this way he is able to modify his speech production continually and gradually develop intelligible speech. The profoundly hearing impaired child's speech perception of the oral message is, however, restricted, in addition his auditory feedback mechanism is impaired or

absent. This results in an inability to monitor his self speech production. Consequently the acquisition of speech production skills, particularly segmental aspects and to a lesser extent supra-segmental aspects is very difficult.

I.2 - EMERGENCE OF THE PROBLEM:

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. Body composition is the most important aspect of growth and development for sports and physical education. It covers the development of various lengths, breadths, girths, skin folds, circumferences etc.

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 factor.

"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.

It is of course true to say that every child has the same basic needs – food and shelter, affection, security, self-respect and acceptance. Every child 'needs' to be recognized as a person in his own right, yet some children come into the school system with considerable deprivations, and in this sense they have very special needs which must be satisfied if they are to develop their full potential as adults. Some children are deprived by the very love their parents have for them, for many physically challenged children are overprotected, and their development thus is limited because they are denied with opportunities to explore their environment. Most children find joy in movement; parents and child together delight in the child's first

steps; older children enjoy rolling, climbing and sliding. Unfortunately many children do not experience the thrill of physical challenge because their locomotive powers are severely limited, because they have impaired sensory perception or because their home circumstances restrict physical play. Some, who are free to play with other children, suffer the frustration of exclusion from childhood games.

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.

Some physical educationalists think that the highly structured, teacher-directed types of program advocated by Kephart and his followers cannot be considered part of physical education since they are concerned with training rather than with educating. Yet this type of work has greatly enriched the lives of many physically challenged children. If a child's difficulties in coordination are so pronounced that he cannot benefit from the more usual forms of physical education or if a child's learning difficulties are very severe then a teacher-directed program of perceptual motor training may be essential. Most children requiring special education, except the most severely mentally handicapped, want to take part in physical activities recognizably similar to those enjoyed by society at large- swimming, football, athletics, dancing, canoeing and so on. However, physical educationalists should not hold too narrow a view of their subject; nor should teachers with limited training in the subject fall into the trap of embracing a particular 'system' either because it is so highly structured or because it appears delightfully open-ended. No system holds all the answers. The wise teacher will attempt over a period of time to give his pupils a balanced program involving traditional activities (or at least a selection of the most appropriate), movement exploration, creative and aesthetic experiences and individually planned programs of sensory motor training. Each approach has something special to offer and a teacher can weight his program to satisfy the needs of the moment.

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 damage[7]. 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.

Games and Individual Sport: In these activities, the ideas of combining, cooperating, giving way, preserving and contributing as an individual to a group are all socially based, and can profitably be absorbed by deaf children on their own or in company with their hearing peers. In games there should be no problem beyond the possibility of delayed response to signals. One must be prepared for occasions when a child in a football game, unaware of the whistle, goes on triumphantly and cheerfully to shoot an inappropriate goal, but the problem is easily remedied if tolerance and a sense of humor are brought into play. In individual sports and athletic events, physically able deaf children can, of course, excel. A few adaptations are necessary. Starting signals should be visible as well as audible. In swimming it is important in the early stages for the teacher to remain alert to potential danger. Hearing-aids are out of the question, and water often blurs vision. Similarly, deaf children cannot easily be talked up a mock rock-climb, though they can be taught to observe prearranged signals and to look for instruction. The general principle of teaching children to be

alert to visual signals if they are likely to be out of touch with audible ones holds in all training in sport and team games, and the overall principle of equipping children to be finally independent and self-reliant, holds in all aspects of physical education.

The potential ability of hearing-impaired children to take part in physical education programs is far more important than their disabilities and shortcomings. The children themselves need to recognize and come to terms with their disabilities so that they can use their own judgment to decide what they are capable of and why. The choice is finally theirs.

It is an unrewarding practice to fragment the curriculum at any level into separate subjects; the education of the child as a whole person must be constantly borne in mind. All aspects of learning should relate to children's needs and must therefore be inter-related. If the underlying aim of education is recognized to be the development of satisfactory personalities, communication must also be recognized as the keystone in any educational program. It has many aspects and can take many forms. Non-verbal communication in physical education cannot only advance verbal communication, but can contribute to the growth of the child as a person. The possibilities of developing more satisfactory social personalities in deaf children by this means are only just beginning to be recognized. It is a field in which exploration and controlled experiment is likely to be most rewarding.

The origin of organized competitive sport for the disabled is directly related to the rehabilitation of Second World War veterans with spinal cord injuries. There are earlier examples of outstanding disabled athletes and of sport organization for the disabled[19].

Considering the equal stature and right of exposure in sports participation; the need for the research in understanding the performance prerequisite: motor abilities development of the normal and the deaf-dumb children has emerged.

I.3 - STATEMENT OF THE PROBLEM:

"A Comparative Study of Body Composition Profiles among normal and that in deaf-dumb between 8 to 14 years"

I.4 – NEED OF THE STUDY:

As the population of the normal mass is comparatively more to that of 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 body composition profiles among deaf-dumb and compare with the normal, which is one of the performance factors.

I.5 – OBJECTIVES OF THE STUDY:

1. To find out, asses and analyze the body composition among normal children and that of deaf-dumb at particular age group.
2. To study the body composition in boys and girls (normal and deaf-dumb) between 08 to 14 years.
3. To compare the body composition among boys and girls (normal and deaf-dumb) between 08 to 14 years.
4. To understand if any specific body compensatory ability among deaf-dumb children is noticed when compared to the normal children.
5. To understand various parameters of body composition in certain age group of certain physical abnormality.
6. To observe and evaluate if some established pattern in food and rest is applicable and useful for physically challenged children.
7. To understand scientific base for methods of training physically challenged children with specific body composition profiles.
8. To understand how the society would help its weak counterpart.

I.6 – 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 motor training with specific body posture and composition for physically challenged children in specific age group.

3. Results may prove helpful to establish training system for normal as well as deaf-dumb children in specific age group.
4. Results may also be helpful to enhance sports terminology communication skills with physically challenged children.
5. The comparison of development of body composition will give clear picture of the positive and negative aspects of the body profiles, which in turn ensure the proper training.

I.7 – 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 between 08 years to 14 years of normal and that of deaf and dumb children.

H-03: The study of body composition and its comparison of deaf-dumb is 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 to that in normal children.

I.8 – 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 applicable for specific age groups and sex.
5. The study is further delimited to the school going children in both normal and deaf-dumb.

I.9 – LIMITATIONS:

1. Diet and rest of the children was a limitation.

2. Involvement of students during assessment and measurement of body profiles test was a limitation.
3. Physical, mental, weather, school, house and surrounding conditions were a limitation.
4. Organization of the tests was adjusted with the concerned school's time tables.

I.10 - 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.

Development is the maturation of organ systems; the acquisition of skills, the ability to stand the stresses and strain of environment.

Development is the action of developing or the state of being developed.

Development is a new stage in a changing situation.

Development is the act or an instance of developing; the process of being developed.

Development is a stage of growth or advancement.

Development is evolution, growth, evolvement, maturation, unfolding, increase, expansion, enlargement, increment, advance, progress, improvement.

Development expresses the interrelation between growth and maturation in relation to the passage of time. The concept of development also includes the social, emotional, intellectual and motor realms of the child. The main focus is on change over time to facilitate the increase in functional capacity and competence.

Development is a broader concept than growth and maturation. Malina prefer to view it in the context of the development of competence in a variety of interrelated domains during childhood and youth, that is, social competence, intellectual and/or cognitive competence, motor competence, and so on.

'GROWTH':

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

Growth refers to quantitative change in the size of the body, for example 'height'[23]. Body segment length and proportions are also direct expressions of the growth process.

Growth refers to measurable changes in body size, for example, height, weight, fatness[27].

'MATURATION':

Maturation is the natural unfolding of the potential with inherent in the human being, is time bound and speaks interaction of self and environment, characterized by progressive differentiation, is organ specific, manifested by progressive refinement and progressive specialization[23].

Maturation refers to qualitative system changes, both structure and function in nature, in the organism's progress toward maturity, for example, change in cartilage to bone in the skeleton[23]. The process of maturation implies changes in the cumulative motor, physical, perceptual, cognitive, social/ psychological capacities of the individual.

Maturation refers to the child's biological clock that marks progress toward the mature state. It is viewed most often in terms of skeletal and sexual maturation and the timing of the adolescent growth spurt… (It) refers to potential or a limit… implies genotypic control, and the result is genetic-environment interaction[27].

'NORMAL CHILD':

Normal: Typical; usual; healthy; according to the rule or standard[25].

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.

The importance of knowledge of normal development: A thorough knowledge of the normal should be just as much the basis of the study of children as is physiology and anatomy for medicine in general. It is an essential basis for the study

of the abnormal and disease. The researcher believe that all concerned with the care and management of children should not only know the normal, but should be thoroughly conversant with the very common normal variations, which do not amount to disease and just as important, should try to understand the reasons for those variations.

'DEAF AND DUMB':

Deafness: There are so many conditions, which are associated with deafness that figures for the mean IQ of deaf children and meaningless. Unilateral hearing loss probably causes few, if any, educational problems.

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

Deafness is the loss of ability to hear without designation of the degree of loss or the cause. For the sake of clarity the otologist usually prefers terms with clearer definitions. The terms related are acusis, hearing, threshold shift, hypoacusis, anacusis, dysacusis, auditory agnosia, presbyacusis, and diplacusis.

Deaf: Sign language with the hands, as used by deaf and dumb people.

Deaf: Wholly or partially unable to hear.

Dumb: is mute; speechless; unable to speak.

Dumb: speechless because shy, embarrassed, or astonished.

Dumb: Unable to speak; lacking the power to speech.

Speech: Speech is important in the assessment of retarded children. The intelligence is perhaps the most important determinant of precocity in speech, since it affects both the ability to mimic and to understand the meaning of verbal symbols- Ausubel. Earliness of onset of speech is one of the most striking developmental characteristics of intellectually gifted children- Terman.

'08 YEARS TO 14 YEARS' (CHRONOLOGICAL AGE):

Chronological age is the number or years and days elapsed since birth[28].

ANTHROPOMETRY

Anthropometry is making external measuring of the human body. This measurement may be either objective, by using instruments such as calibers or subjective using a list of characteristics (Mayers, 1974).

- **Height:** Height is the total vertical length of an individual from the point vertex to the ground (Centimetres).
- **Sitting Height:** It is the height of point vertex from the horizontal table top on which the subject sits with his/her legs hanging down while the thighs rest completely on the table top (Centimetres).
- **Weight:** Weight is the complete mass of an individual standing on the weighing scale with optimum clothing (Kilograms).
- **Humerus Bicondylar Diameter (Elbow Width)**: It is the maximum straight distance across the outer most points on the two lateral condyles on the lower end of humerus.
- **Femur Bicondylar Diameter (Knee Width)**: It is the maximum straight distance across the outermost points on the condyles at the lower end of the femur.
- **Biceps Girth**: The circumference or girth of freely hanging upper-arm measured midway between the point acromiale and radial is known as upper-arm circumference/ girth.
- **Calf Girth**: It is the maximal circumference of the lower leg over the calf muscle.

- **Subscapularis Skinfold**: It is the thickness of double layer of skin plus subcutaneous fat below the inferior angle of left scapula.
- **Chest Skinfold**: It is the thickness of double layer of skin plus subcutaneous fat above the nipples on pectoralis major muscle.
- **Triceps Skinfold**: It is the thickness of the double layer of skin plus subcutaneous fat on the posterior side of the upper arm over the triceps muscle, in the middle of upper-arm.

- **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.

- **Suprailliac Skinfold**: It is the thickness of double layer of skin plus subcutaneous fat over the iliac spine, on the left lateral side of the abdomen.

- **Thigh Skinfold**: It is the thickness of the double layer of skin plus subcutaneous fat on the anterior side, at the middle of , thigh exactly at the level of thigh circumference measurement.

- **Calf Skinfold**: It is thickness of the double layer of skin plus subcutaneous fat, on the medial side of calf, in line with the long axis of the leg, exactly at the level of calf circumference.

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CHAPTER – II

REVIEW OF RELATED LITERATURE:

Research in the field of physical education and sports is vast and moreover with the emphasis is on the development of performance in competition and achievement levels. The required mental and physical qualities for enhancing the performance in sports are many, but to quote, the basic prerequisite are motor abilities in which many researches' are carried out. The researcher has gone through the related literature from various sources and tried to quote the maximum in relation to the studies carried out with motor abilities from birth till adolescent. Much of the literature is in relation to the development of normal children when compared to the physically challenged, specifically deaf-dumb.

The related literature reviewed for better understanding of the problem and to interpret the results systematically, they are presented in this chapter. The reviews were collected from various sources like books, journal, and periodicals and provide back ground information to the study and help us to understand various concepts of yogic practices and physical exercises on health related fitness, BMR and lipid profile. The literature in any field forms the foundation upon which all future work will be built. If one builds upon the foundation of knowledge provided by the review of literature, the investigator might not miss some similar work already done on the same topic.

The reviews of the literature have been classified under the following headings: 1. Studies on physical exercise training on selected variables. 2. Studies on yogic practice on selected variables. 3. Summary of the literature. 1. Studies on physical exercise training on selected variables Padmanathan, (2011), conducted a study on the effect of low impact aerobic exercises on selected health related physical fitness variables such as muscular endurance, cardio respiratory endurance, and flexibility and Body mass index of male adolescents. Their age ranged from 12 to 15 years. They were divided in to two groups and designed as Experimental group 'A' and Control group 'B' The Experimental group-A was given aerobic and calisthenics exercises for a period of twelve weeks, both morning and evening for five days in a week, whereas control group-B is not involved any specific exercise programme other than their regular physical activities programme as per their school curriculum. The

result of this study indicated that muscular endurance and cardio respiratory endurance were significantly improved and also it was observed that Body mass Index significantly reduced.

The development of Sheldon‘s system 1, researcher is proposed to study & analyse the effect of selected Yogic Practices (Asanas & Pranayama) & Aerobic exercise on Somatotype Components and relationship with selected Health Related Physical Fitness Components such as Muscular Strength & Endurance (Arm strength), Cardio vascular Endurance (Twelve minutes run), Muscular Flexibility (Flexibility Measures) & Body composition (Percent Body fat)and Biochemical (lipid profiles-TG, LDL, HDL, TG, TC, FBS and Hb). Benson and Toyee**1** presented a novel approach for measuring body size estimation in normal and eating-disordered women and men. Clinical categories of body types were used as prototypes. By comparing the subjective appearance of a person’s body with prototypes, we can understand how different attributes of his or her body shape contribute to perception of body size. Body composition, Body-Image computer- graphics and eating disorder were analyzed. After lifelike random distortions have been applied to parts of their body image, individuals adjust their body shapes until they converge on their perceived veridical appearance. Exaggeration and minimization of particular body areas measured with respect to their true shape and with different prototypes can be expressed as numerical deviations. In this way, perceived body size and body attractiveness can be appraised during the course of diagnosis and treatment of eating disorders.

Dolgener, et.al.,**2** stated that a series of body build composition variables were determined on a group of 29 female ballet and modern dancers. The purpose of this study was to quantify the components of body build and physique of group of high ability female ballet and modern dancers. All measurements were obtained with the subjects wearing two piece bathing suits. Body weight and height, body diameters, circumferences and skinfold were measured. Skinfold such as chest, mid auxiliary, triceps, subscapular abdominal super-iliac, thigh, calf, knee and diameter such as deltoid, biacrominal, chest-iliac, bitrochanteric knee, ankle, elbow, wrist, Girths such as neck, shoulder, chest, minimum abdomen maximum abdomen , hips, thigh, knee, calf, deltoid, biceps, extended biceps flexed, forearms, wrist. The average of trials was

used as the measurement at each site. T-Test was computed between the two groups on all the measured and computed variables to determine if differences exited between the modern and ballet dancers. Somatogram, which represents a comparison of ballet dancers with a group of non-dancers as described by Behnke and Wilmore, indicated that the dancers are different from the non-dancers in body build.

Solley 3 study was made to further analyze factor in physical role played by this growth that would enable the teacher to understand better for the factors in the growth of children. The purpose was to determine the status of physique, change in physique and speed in growth pattern of children in a typical elementary school. The Wetzel Grid was introduced as a diagnostic instrument in the first four grades of the campus school, Wisconsin State College at River Falls. Measurement of height and weight were made within one week of January 15 each year. Therefore, progress of growth as studied in that over one year period ranging from January to January. All ages were scored from school record. After each measurement period, growth curves were plotted on the Grid. The proposition of students the significance of the relationship between the growth factors was further analyzed for the proportion. The chi-square test of independent was employed to determine the significance of relationship that existed among physique, change in physique and speed and among these factors and sex and grade level. Change of physique and speed of growth also showed a significant relationship. The relationship between speed and sex were statistically significant while speed and grade level appeared to be non-related.

Brown**4** was designed to determine the relationship between body type and body alignment and center of balance. The purpose of this study was to determine if there was any relationship between the constitutional body type and the static postures of adult college women. The subjects participating in this investigation were 58 volunteer, young adult, college women at the Washington State University. There were 27 subjects either majoring or minoring in Physical Education. The remaining 31 had various other major. The subjects had a mean age of 20.15 years, a mean height of 65.6 inches and mean weight of 139 lbs. Each individual was somato typed according to the photographs, the center of balance was determined utilizing the Lovett and Renold technique and the body alignment was taken by utilizing the modified Howland alignometer. It was concluded that somato typed for young adult

women was not related to body alignment since other studies have found significant relationship between body type and body alignment in men.

Pierson**5** selected twenty-one untrained subjects, based on body build to investigate certain relationships between heights, lean body mass, body fat, reaction time and over-all body speed of untrained subjects. Subjects were selected to represent the following body builds: short and heavy, short and light, tall, heavy, tall, and light. There were five, four, five and seven subjects respectively in each group. After the subjects' height and weight were coded, simply reaction time was measured. This involved finger lift in response to a visual stimulus and to distinguish it from RT measured in conjunction with over-all body speed was designated by laboratory RT. The time of a sprint start was then read from the first chronoscopic and over-all body speed in second. Reaction time as thus measured was designed operational RT. The present study may be interpreted as indicating that the speed, which the untrained individual can react, has little relationship to his size or composition.

Laubach and Conville **6** study was to investigate the relationship between various aspects of flexibility and selected anthropometric measurements and the somatotype of college men. Sixty three Antioch College male students' volunteers, who were paid for their participation in this study, were used as subjects. Ages of the students ranged from 16 to 25 years. Forty-six anthropometric measurements were measured. The means standard deviation and coefficients of variation were computed for the fourteen flexibility measurements. The Sheldon method was used for the somatotype assessments, the fourteen-flexibility measurement significant beyond the 0.01 level of confidence. There was a general lack of relationship between flexibility measurements and somatotype components. High coefficients of correlation between the anthropometric measurements utilized in the study and the somatotype components.

Slaughter and Loheman **7** study was to determine the association of somatotype and body composition in boys of 7 to 12 years old. Somatotype was measured by two methods. Sheldon's revised trunk index method and Heath – Carter's anthropometric method were used. Body composition was estimated as fat and lean body mass using a whole body method. The subjects were 45 young boys

with a mean age of 10.04 years ranging from 7.25 to 12.59 years. These boys participated in the University of Illinois sports- fitness program during the summer of 1975. Heath-carter's first component and Ectomorphy, Percent body fat was significantly related to all Somatotype components of both methods except for Sheldon's mesomorphy. Absolute lean body mass was significantly correlated with Sheldon's Ectomorphy. It was concluded that the Endomorphy, the first component reflect body fatness to a considerable extent, but that little association between lean body mass and mesomorphy existed among children.

Marcel Hebelinck and Postma 8 study was to determine number of physical characteristics and somatotype rating of College physical education Majors in South Africa. Among these characteristics and rating of college Physical education major at the University of Stellenbosch and the relationship of these characteristic and ratings with certain, motor fitness tests were analysed. Physiological factors, such as muscle action and efficiency of the circulatory and respiratory systems and psychological data were obtained from fifty-two male physica education majors. All were junior and seniors in the Department of Physical Education and aged from 18 to 25 years. Height, weight, shoulder width, neck girth, waist girth, shoulder width, neck girth, waist girth, reciprocal ponderal index and waist neck girth index were taken. The Sheldon method was used for the somato typing and points were allocated for endomorphic, mesomorphic and Ectomorphic characteristics. The fitness tests were administered such as 60 yard dash, chinning, dipping, standing vertical jump, standing broad jump and putting the shot. The sum of these scores for the six tests used indicated the total motor fitness in this investigation. The result showed that the mesomorphic type has the better motor fitness scores.

Herman et.al.,9 studied on body size was determined by measurement characteristic such as height, weight ,muscle development of adipose tissue and skeletal or body structure. The study was to identify the relationship of extreme body type to range of flexibility at Pennsylvanian State University in 1953. It was also to determine whether some prediction could be made about flexibility in terms of known body size. Thirty-five of thinnest fattest and most muscular students were selected. Ages ranges from 18 and 22 years. They were judged whether their body type related to ectomorphy or mesomorphy or endomorphy. A black and white grid with

horizontal diameter and perpendicular planes were placed behind it to be used. Later, as a guide for photogrametric purpose the relaxed pose of different measurement were taken. The Panatonic X -ray films was used with en-posture time set 1/25 seconds and the lens stopped down, f = 4.5. Five breath measurements taken in rear pose. In statistical technique their correlation to determine flexibility and Somatotype variable, somatotype and flexibility multiple correlation caused to show predictive value of flexibility, when associated with somatotype criteria. To determine the possible extent of influence of similar flexibility traits in different body type chi-square was used. The‘t’ was used value to determine significant of differences between the group means of the three-body type. It concluded that the significant difference between two laterals types such as endomorphy and Mesomorphy were found.

Lan Bach and convellee**10** pointed out the relationship between flexibility and anthropometry using lighter technique of 63 college male students as subjects by excluded the subject with physical deformities and organic deficiency. The subject age ranged between 16 to 25 years with mean age of 19 years. He computed lean body mass from different skinfold measurements. It was concluded that the body fat as measured by skinfold caliper yielded fairly high significant, negative correlation with flexibility measurement.

Rider and Daly**11** conducted an experiment study on the effect of flexibility on enhancing spinal mobility in older women. Ten week flexibility training program was given to female old women with mean age of 71.8 They were randomly assigned to either the experimental group (Flexibility Training) or control group (no training). Prior to initiation of training, all subjects were rested for total spinal mobility the combined sum of spinal flexion and extension. After final test it was found that a significant improvement in the spinal mobility accord due to flexibility training.

Cureton, et.al.,**12** studied on the body fatness and performance difference between men and women. For the purpose the physical performance test and the percent body fat were tested. The Skinfold thickness measured to find out percent body fat and the physical performance by modified pull-ups, Vertical jump, 50 yard dash; 12 minutes run were measured for 55 male college students. It was concluded that greater body fatness was lesser the physical fitness. This partly explains why

women on an average do not perform as well as men on strenuous task requiring movements of body weight.

Madanmohan, et.al.,**13** conducted study to determine the effect of yoga training on reaction time, respiratory endurance and muscle strength. For this investigation they selected 27 male medical students volunteer residing in the college hostel. Their age was 18-21 years, weight 50-69 kg and height 161-179 cm. The experimenting subjects were tested on visual and auditory times (RT.), maximum expiratory pressure(MEP) maximum inspiratory pressure (MIP), 40 mm Hg test, breath-holding time after expiration(BHT exp), Breath holding time after inspiration(BHT insp), and hand grip strength (HGS). The researchers found out that there was a significant decrease in visual RT as well as auditory RT (from 194.18 + 126.46 + 10.75mmHg) while MIP increased from 72.23 + 6.45+ 90.92 +60.03mm Hg. Both these charged being statistically ($P<0.001$) from 36.57 + 83.36 + 3.95s and 13.78+ 0.58 to 16.67) 0.47 Kg respectively BHT exp. Increased from 32.15 + 1.41 to 44.53 +3.78 ($P<0.01$ and BHT insp. Increased from 63.69 + 5.38 to 89.07 + 9.61 ($P<0.05$). They concluded that yogic practice showed a significant reduction in visual and auditory RT and significant increase in respiratory pressure breath holding times and Hand grip strength.

Gopal et al.**14** studied the effect of Yogasanas and Pranayama on blood pressure, pulse rate and some respiratory function. Two groups of male volunteers of 20-33 years in age and having the same averaging height and weight were studied. The experimental group of 14 subjects in Yogasanas and Pranayama for a period old six weeks. The control group consisted of 14 normal untrained subjects, who carried out nonyogic exercise i.e. involved in long walk and light games. Pre-test and post-test were conducted to both the groups before and after training. The result showed that a corresponding increase in respiratory function.

K.N.Udappa et.al.**15** carried out a comparative study on the effect of yogic postures namely sarvangasana, shirshasana and halasala along with their complementry postures namely matayasana, mayurasana and pashchimathanasana on physical, Physiological endurance and metabolic changes. The subjects were six healthy young males of average age of 20. At the end of every third month the under

mentioned physical and physiological factors, such as body weight, abdominal girth, chest girth, rate of inspiration, breath – holding time, vital capacity, pulse rate and blood pressure were assessed. Simultaneously the volunteers were tested with biochemical investigation, such as fasting blood sugar, total serum lipid, total serum Protein, Plasma cortisol, urinary 17 –hydroxycorticosteroids, urinary 17-betosteriods and urinary catecholamines (UMA). The training on sarvangasana appears to induce prominent physiological effect, especially in cardio-respiratory system with fewer amounts of physical changes. It also produces some important endocrine and metabolic effects. The remaining two types of practices produce more of physical effects and lesser amount of Physiological changes.

Khanna et.al.,**16** studied on a cross-sectional sample comparison of 313 subjects of 8-14 years of ages. The subjects of the study participated actively in some other physical activity. Cycle ergometer was used to evaluate cardio-pulmonary responses. Each subject were given a graded protocol exercise starting with an initial work of 1W/Kg of body weight and thereafter every two minutes work load was increased by 0.5w/kg till exhaustion. Oxygen consumption, carbon-di-oxide production, ventilation, heart rate and oxygen pulse were recorded after every 30 seconds on a computerized ergoneumo test during exercise and recovery of Oxygen was computed. It had been concluded that VO2/min and HR at 2 W/Kg of work Load can best predict maximum aerobic capacity and oxygen debt. Recovery VO2 value at 2nd min can predict VO2 max and O2 debt VCO2 /min, max and O2 pulse have highest.

Ashok and Rupiner**17** studied to examine the distribution of subcutaneous fat in young adult physically active 50 males and 50 females and aged 18-24 years. The conditioning program consisting of exercises targeted to improve flexibility, Strength and cardio respiratory endurance for 90 days. The data significantly analyzed by using the SPSS X Software. The ANOVA and Scheffe Post hoc tests were used to derive the result. The result showed that the distribution pattern of subcutaneous fat in the form Skinfold thickness in males was sub scapular (maximal) followed by calf, triceps suprailiac, biceps (minimal). The subcutaneous Skinfold thickness from the observed body sites significantly decreased (except Subscapular in females) with the

progression of a conditioning program but it could not change the preconditioning distribution pattern of subcutaneous fat in both males & females. Whereas the Body fat Percentage significantly decreased and LBM% significantly increased only in females after conditioning program. lowers the total body fat by mobilizing and using the subcutaneous fat and on the other hand increase lean body mass (LBM) both in males & females. These findings indicated that a conditioning program on the one hand

Ravinderan et. al.,**18** studied to assess the changes in blood glucose level before and after the aerobic exercise with two types of recovery periods 20 min and 60 min respectively. Ten men students were randomly selected as subjects from 50 students of department of physical Education, Annamalai University. Their age ranged 19-22 years. For aerobic Conditioning, inclination of treadmill set at 5.5percent and speed was 10 km/hr-1 for 15 minutes on completion of the aerobic exercise, post blood samples (ante-cubital vein were collected from Group I & Group II with a recovery of 20 minutes & 60 minutes respectively. The result shows that t ratio for the difference between pre and post test for 20 minutes test on blood glucose level was decreased after aerobic exercise at different condition of recovery period. The longer recovery after aerobic activity impacted on re-synthesis of glucose.

Bowman et. al.,**19** studied to find whether the age-associated reduction in baroreflex sensitivity was modifiable by exercise training. The purpose of the study was to find the effect of the Aerobic exercise and the Yoga, a non-aerobic control intervention, on the baroreflex of elderly persons was determined. Baroreflex sensitivity was quantified by the α-index, at high frequency and mid-frequency, derived from spectral and cross-spectral analysis of spontaneous fluctuations in heart rate and blood pressure. Twenty-six (10 women) sedentary, healthy, normotensive elderly and the mean age of 68 years and range from 62– 81 years subjects were selected for the study. Fourteen (4 women) of the sedentary elderly subjects completed 6 weeks of aerobic training, while the other 12 subjects(6 women) completed 6 weeks of yoga. Heart rate decreased in following yoga but not aerobic training. VO2 max increased by 11% following yoga and by 24% following aerobic training. No significant change in αMF occurred after aerobic training. Following yoga, but not increased. Short-duration aerobic training does not modify the α-index

at αMF or αHF in healthy normotensive elderly subjects. αHF but not αMF increased following yoga, suggesting that these parameters are measuring distinct aspects of the baroreflex that are separately modifiable.

Gilliam and Burke **20** analyzed the effect of exercise on serum lipids a six-week study involving 14 females ages 8-10 years. The subjects participated in various aerobic activities for 35 minutes per session. The results showed that a significant increase in HDL-C levels with no change in TC levels. The main flaw in this study was a lack of a control group. Additionally, intensity was described as “strenuous” but was not quantified, the length of the study was short (six weeks) and the frequencies of the exercise sessions were not reported.

Linder et. al.,**21** examined the effect of an eight-week walk/jog program at heart rate (HR) intensity of 80 % of peak HR on 29 boys, ages 11-17 years. No effect was observed for TC, TG, HDL-C, or LDL-C. The inherent problem in this study was the inclusion of boys who are at differing maturational stages.

Savage et. al.,**22** walk/jog/run program with 8-9 year old boys resulted in no alterations in TC or LDLC or HDL-C levels after the 11-week study. However, they did note an overall improvement in the TC/HDL ratio.

Ignigo and Mahon **23** examined the effects of ten week exercise training program on TC, TG, HDL-C and LDL-C in boys and girls ages 9-10 years. Eighteen children participated in an exercise training program and ten children served as control group. The exercise program included 60 minutes of aerobic activity, three times per week at an exercise intensity that elicited heart rates of 160-180 b·min-1 (80-90 % of peak HR). TG was the only variable that was favorably altered after the 10-week exercise intervention. Although the authors mentioned the use of heart rate monitors, they also mentioned that heart rates were monitored by pulse counting and thus it was not clear how many subjects were using heart rate monitors at any one time. Additionally, the inclusion of both boys and girls in a relatively small sample size may result in an affect that independent of the exercise intervention.

Blessing and Williford **24** done an experimental study for 16 week training on Blood lipid and physiological responses in adolescents of the longest to date, their subjects were 25 males and females who ranged in age from 13-18 years. The 16-week training program involved 40 minutes of various aerobic activities at an intensity that was to approach 90% of previously determined peak work capacity. Intensity was measured by the subjects obtaining a radial pulse. The results showed that a positive alteration in TC, HDL-C, LDL-C, TC/HDL-C levels after the 16 weeks of exercise training. The inherent problem with this study was the inclusion of both males and females in the same study. Additionally, the age range of 13-18 years was too broad due to the differing maturational stages of this group.

Rowland et.al.,**25** conducted a thirteen week study that included 34 boys and girls of ages ranged from 10 to 13 years. First, there was not a control group. Instead, the subjects acted as their own controls to try and minimize the genetic effects of trainability between subjects. However, this study design did not control the effect on growth and maturation. Second, although heart rate monitor were used to measure exercise intensity, only seven subjects used the monitors during each exercise session. The result showed that exercises intensity was only collected on each subject for one out of three exercise sessions each week. A final source of error was again subject heterogeneity. As mentioned previously, the inclusion of adolescent boys and girls in the subject pool makes interpretation of blood lipid and lipoprotein changes difficult.

Stergioulas et.al.,**26** examined the effect exercise training had on HDL-C levels in 18 boys ages ranged 10 to 14 years. The subjects were chosen from a group of 1000 Greeks who participated in a survey that was conducted in 1993. HDL-C levels increased significantly after the eight-week training program. There were several inherent problems with this study. First, it is difficult to ascertain how exercise intensity was measured. They indicated that exercise was set at 75 % of physical working capacity that was an exercise with heart rate of 170 b·min-1. However, it is not clear whether a peak exercise test was completed prior to the exercise intervention or whether peak heart rate information was gathered from the Greek survey results of 1993. If exercise heart rate was estimated, than it was questionable that a heart rate of 170 b·min-1would be accurate for boys with an age ranged from 10 to 14 years. Second, the authors did not describe whether or not heart rate was monitored during

the exercise sessions. A final source of error was subject heterogeneity. Although only boys participated in the study, their maturity level was not assessed. Assessment of maturity levelwas pertinent because there were most likely significant differences in the boys who ages ranged from 10-14 years and, as mentioned above, testosterone has been shown to adversely affect the blood lipid and lipoprotein profile of males.

Stergioulas and Filippou**27** conducted a second study with 10-14 year old boys. In this study all subjects completed peak exercise tests for the determination peak HR. The subjects completed 4 training sessions per week at 80 % of their peak HR for 8 weeks. Significant, positive alterations were observed for all variables at the end of the eight weeks. However, it again needed to be pointed out that the probable maturity differences among the subjects made the data difficult to accurately interpret.

Stoedefalke et.al., (2000) 28 has the longest well controlled exercise training study to examine the effects of exercise training on post menarchial 13-14 year old girls. The twenty week study included twenty experimental subjects and eighteen control subjects. All subjects underwent peak exercise tests to determine maximal HR values. Subjects exercised three times per week for 20 minutes on either a treadmill or cycle ergometer. Exercise intensity was kept at 75-80% of maximal HR as verified by HR monitors. No significant change in TC, HDL-D, LDL-C or TG was observed in either group.

Welsman et. al.,**29** examined the effect two separate modes of aerobic training had on TC levels in 35 girls' aged from 9-10 years. The exercise intervention lasted eight weeks and exercise intensity was set at approximately 80 % of peak HR. All subjects underwent peak exercise tests to determine peak HR values. No changes in TC or HDL-C were observed in either group. Subjects exercising on the cycle ergo meters with heart rate monitors so that exercise intensity could be accurately measured. Subjects who participated in the aerobic dance program underwent a pilot study to determine which routines would consistently elicit heart rates above 150 b·min-1. Additionally, if the subjects in the aerobic dance group experienced a decline in sub-maximal HR than the dance routines may not have been rigorous enough to elicit HR levels of 150 b·min-1 in the latter weeks of the study.

Tolfrey et.al.,**30** conducted a very well controlled study with 48 prepubertal boys and girls of which twenty eight of the subjects completed an exercise training intervention. They controlled for exercise intensity by using HR monitors and through constant encouragement, they were able to have all subjects maintain an exercise intensity of 79% of peak HR. The subjects pedaled on cycle ergometer three times per week for 12 weeks. The results showed that there was no difference over time for TG and TC between the two groups. However, the exercise group experienced an increase in HDL-C and a decrease in LDL-C levels. Changes in the blood lipid profile were independent of alterations in peak VO2. In fact, the control group started out with a higher peak VO2 and maintained the greater peak VO2 until the end of the study suggesting that it was the exercise training which directly affected blood lipid profiles and not peak VO2. This was the first study that had adequately controlled for exercise intensity and, although it probably unrealistic to expect children to continue to exercise at a constant intensity, doing the same mode of exercise outside of an experimental setting, the study did advance our knowledge of the effects a highly structured exercise training program has on blood lipids and lipoproteins in pre-pubertal children. The major design flaw was the inclusion of both boys and girls in the study. Additionally, as mentioned above, few studies have lasted longer than 12 weeks and it would have been beneficial to observe whether a longer training period resulted in more dramatic differences.

Tolfrey et.al.,**31** conducted a second training study with 34 subjects, ranged 10-11 year old boys and girls. All subjects exercised three times per week at 80 % of peak HR. Again all subjects wore HR monitors for the 12-week exercise-training program. Unlike other studies, the study was unique in that exercise duration was individualized to match energy expenditure targets. Two groups were established. A LOW group that expended 100 kcal·kg -1 and the MOD group that expended 140 kcal·kg -1. The exercise training program elicited no change in TC, HDL-C or LDL-C irrespective of exercise duration and energy expenditure. The authors suggest that the exercise volume may have been insufficient to elicit a change.

Williford and Blessing 32 study was to examine exercise training effects in black, male adolescents. Twelve boys completed a 15 week, 5 day per week exercise training program. The exercise sessions took place for 30 minutes during a regularly

scheduled physical education class. The subjects jogged at 70-90 % of their pre-determined peak heart rates. It was not clear how HR was monitored. Unique to this study was the inclusion of a weight-training program that took place two times per week. The 15-week exercise-training program resulted in significant increases in HDL-C and significant decreases in LDL-C. No change in TC occurred. The authors point out that further research was needed regarding the effects of ethnicity and the effects of exercise training on blood lipids and lipoproteins.

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CHAPTER – III

METHODOLOGY

III.1 – 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. The tests were conducted after year so as to assess the developments taking in their body composition. For obtaining the difference between growth they are 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. In growth, height, sitting height, weight, 6 skinfold measurements, elbow and knee diameter, biceps and calf girths is evaluated. The tests were administered individually under standard conditions applicable for specific tests with required caliberation.

III.2 – 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 and Final.

DEPENDENT VARIABLES:

GROWTH:

1. Height.
2. Sitting Height
3. Weight.
4. Subscapularis skinfold
5. Chest skinfold

6. Triceps skinfold
7. Abdomen Skinfold
8. Suprailliac skinfold
9. Thigh skinfold
10. Calf skinfold
11. Humerus bicondylar diameter
12. Femur bicondylar diameter
13. Biceps girth
14. Calf girth

DEFINITION OF THE GROWTH AND DEVELOPMENT FACTORS:

1. **Height:** Height is the total vertical length of an individual from the point vertex to the ground (Centimetres).

2. **Sitting Height:** It is the height of point vertex from the horizontal table top on which the subject sits with his/her legs hanging down while the thighs rest completely on the table top (Centimetres).

3. **Weight:** Weight is the complete mass of an individual standing on the weighing scale with optimum clothing (Kilograms).

4. **Subscapularis Skinfold**: It is the thickness of double layer of skin plus subcutaneous fat below the inferior angle of left scapula.

5. **Chest Skinfold**: It is the thickness of double layer of skin plus subcutaneous fat above the nipples on pectoralis major muscle.

6. **Triceps Skinfold**: It is the thickness of the double layer of skin plus subcutaneous fat on the posterior side of the upper arm over the triceps muscle, in the middle of upper-arm.

7. **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.

8. **Suprailliac Skinfold**: It is the thickness of double layer of skin plus subcutaneous fat over the iliac spine, on the left lateral side of the abdomen.

9. **Thigh Skinfold**: It is the thickness of the double layer of skin plus subcutaneous fat on the anterior side, at the middle of , thigh exactly at the level of thigh circumference measurement.

10. **Calf Skinfold**: It is thickness of the double layer of skin plus subcutaneous fat, on the medial side of calf, in line with the long axis of the leg, exactly at the level of calf circumference.

11. **Humerus Bicondylar Diameter (Elbow Width)**: It is the maximum straight distance across the outer most points on the two lateral condyles on the lower end of humerus.

12. **Femur Bicondylar Diameter (Knee Width)**: It is the maximum straight distance across the outermost points on the condyles at the lower end of the femur.

13. **Biceps Girth**: The circumference or girth of freely hanging upper-arm measured midway between the point acromiale and radial is known as upper-arm circumference/ girth.

14. **Calf Girth**: It is the maximal circumference of the lower leg over the calf muscle.

III.3 - 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:**

- Height
- Sitting Height
- Weight
- Subscapularis Skinfold
- Chest Skinfold

- Triceps Skinfold
- Abdomen Skinfold
- Suprailliac Skinfold
- Thigh Skinfold
- Calf Skinfold
- Humerus Bicondylar Diameter (Elbow Width)
- Femur Bicondylar Diameter (Knee Width)
- Biceps Girth
- Calf Girth

III.4 – 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 July2011 and the second test on the same subjects was organized from 02nd to 6th April 2012 for evaluating the natural growth. While organizing the tests the following things are observed strictly for objectivity, reliability and validity of the findings: (1) The sequence of tests. (2) The condition of the subject before undergoing / performing the test is normal and motivated. (3) No exertion in daily activities. (4) Proper and comfortable kit while performing the test. (5) Condition of the surface and other physical equipment required for test. (6) Sufficient time was allotted for equipment caliberation. (7) Obtained information of diet and recovery the day before from the subject. (8) Instructions regarding the specific tests are passed before the test.

The sequence of the tests was so organized as follows:

Day one- Height, Sitting Height, Weight, Elbow Width, Knee Width, Biceps Girth, Calf Girth

Day two- Triceps Skinfold, Chest Skinfold, Suprailliac Skinfold, Subscapularis Skinfold, Thigh Skinfold and Calf Skinfold

DAY ONE:

- **Height:** Height is the total vertical length of an individual from the point vertex to the ground (Centimetres).
- **Sitting Height:** It is the height of point vertex from the horizontal table top on which the subject sits with his/her legs hanging down while the thighs rest completely on the table top (Centimetres).
- **Weight:** Weight is the complete mass of an individual standing on the weighing scale with optimum clothing (Kilograms).
- **Humerus Bicondylar Diameter (Elbow Width)**: It is the maximum straight distance across the outer most points on the two lateral condyles on the lower end of humerus.
- **Femur Bicondylar Diameter (Knee Width)**: It is the maximum straight distance across the outermost points on the condyles at the lower end of the femur.
- **Biceps Girth**: The circumference or girth of freely hanging upper-arm measured midway between the point acromiale and radial is known as upper-arm circumference/ girth.
- **Calf Girth**: It is the maximal circumference of the lower leg over the calf muscle.

DAY TWO:

- **Subscapularis Skinfold**: It is the thickness of double layer of skin plus subcutaneous fat below the inferior angle of left scapula.
- **Chest Skinfold**: It is the thickness of double layer of skin plus subcutaneous fat above the nipples on pectoralis major muscle.

- **Triceps Skinfold**: It is the thickness of the double layer of skin plus subcutaneous fat on the posterior side of the upper arm over the triceps muscle, in the middle of upper-arm.

- **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.

- **Suprailliac Skinfold**: It is the thickness of double layer of skin plus subcutaneous fat over the iliac spine, on the left lateral side of the abdomen.

- **Thigh Skinfold**: It is the thickness of the double layer of skin plus subcutaneous fat on the anterior side, at the middle of , thigh exactly at the level of thigh circumference measurement.

- **Calf Skinfold**: It is thickness of the double layer of skin plus subcutaneous fat, on the medial side of calf, in line with the long axis of the leg, exactly at the level of calf circumference.

III. 5 - 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.

III.6 – 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.

The obtained values of the mean, standard deviation, t-Test, are given in the tables below followed by the graphical representation. The graphs and tables interpretation are evaluated sequentially in the growth along with the comparison of normal boys to deaf-dumb boys and normal girls to deaf-dumb girls.

CHAPTER – IV

RESULTS AND DISCUSSIONS

IV.1 - RESULTS:

Table No. IV.1: Mean of Height, Sitting Height, Weight, Scapula Skinfold, Chest Skinfold, Triceps Skinfold

	Height	Sitting Height	Weight	Scapula	Chest	Triceps
COMPLETE	134.97	68.17	28.05	6.7	2.71	8.08
NORMAL BOYS 8-14	135.82	66.9	30.11	5.46	6.11	8.05
NORMAL GIRLS 8-14	134.44	68.07	26.65	9.15	0	9.04
DEAF & DUMB BOYS 8-14	134.87	68.56	27.44	4.7	4.75	6.17
DEAF & DUMB GIRLS 8-14	134.74	69.14	27.98	7.48	0	9.06
NORMAL BOYS 08 YEARS	121.32	62.84	22	4.132	4.312	6.68
NORMAL BOYS 09 YEARS	126.2	61.2	27.2	6.508	6.864	8.936
NORMAL BOYS 10 YEARS	129.48	62.12	26.44	5.196	5.848	7.472
NORMAL BOYS 11 YEARS	133.44	64.96	27.08	5.332	6.424	8.092
NORMAL BOYS 12 YEARS	138.8	68.68	30.24	5.368	6.084	8.504
NORMAL BOYS 13 YEARS	148.2	73.64	35.48	6.196	7.18	8.768
NORMAL BOYS 14 YEARS	153.36	74.92	42.36	5.544	6.088	7.9
NORMAL GIRLS 08 YEARS	118.36	62.12	19.28	7.7	0	8.824
NORMAL GIRLS 09 YEARS	125.36	64.04	22.08	7.808	0	8.424
NORMAL GIRLS 10 YEARS	126.92	63.56	22.64	8.624	0	10.336
NORMAL GIRLS 11 YEARS	134.56	68	27.08	8.764	0	9.176
NORMAL GIRLS 12 YEARS	143.04	71.76	30.96	9.496	0	8.856
NORMAL GIRLS 13 YEARS	145.44	72.92	31	10.392	0	8.92
NORMAL GIRLS 14 YEARS	147.4	74.12	33.56	11.268	0	8.784
DEAF & DUMB BOYS 08 YEARS	121.6	61.92	20.52	4.516	5.484	6.836
DEAF & DUMB BOYS 09 YEARS	122.52	63.08	20.96	4.004	4.832	5.604
DEAF & DUMB BOYS 10 YEARS	130.76	68.44	23.6	4.052	3.704	5.488
DEAF & DUMB BOYS 11 YEARS	140.72	71.08	30.64	5.1	5.324	8.6
DEAF & DUMB BOYS 12 YEARS	134.04	68.96	27.2	4.46	3.912	4.42
DEAF & DUMB BOYS 13 YEARS	144	71.4	31.44	5.476	5.032	5.404
DEAF & DUMB BOYS 14 YEARS	150.48	75.08	37.76	5.324	4.996	6.88
DEAF & DUMB GIRLS 08 YEARS	123.64	64.28	21.44	5.444	0	7.008
DEAF & DUMB GIRLS 09 YEARS	123.68	63.76	20.6	6.52	0	8
DEAF & DUMB GIRLS 10 YEARS	127.76	65.8	23.28	6.488	0	8.344
DEAF & DUMB GIRLS 11 YEARS	137.56	69.64	27.04	6.632	0	10.2
DEAF & DUMB GIRLS 12 YEARS	142.2	72.68	32.8	6.556	0	9.02
DEAF & DUMB GIRLS 13 YEARS	143.08	73	33.96	9.276	0	8.972
DEAF & DUMB GIRLS 14 YEARS	145.32	74.88	36.8	11.5	0	11.936

Table No. IV.2: Mean of Abdomen Skinfold, Supra Illiac Skinfold, Thigh Skinfold, Humerus Diameter, Femur Diameter, Biceps Girth, and Calf Girth

	Abdomen	Super Illiac	Thigh	Calf	Humerus Diameter	Femur Diameter	Biceps Girth	Calf Girth
COMPLETE	9.63	9.09	11.55	8.34	5.08	7.27	16.48	22.96
NORMAL BOYS 8-14	6.81	8.53	11.35	9.39	5.21	7.48	17.08	23.75
NORMAL GIRLS 8-14	14.18	10.89	13.64	8.64	5.06	6.86	16.3	22.14
DEAF & DUMB BOYS 8-14	5.78	7.02	9.18	6.5	5.14	7.55	16.21	22.88
DEAF & DUMB GIRLS 8-14	11.76	9.91	12.04	8.82	4.9	7.19	16.34	23.08
NORMAL BOYS 08 YEARS	4.724	6.056	9.696	6.752	4.688	7.032	15.36	21.24
NORMAL BOYS 09 YEARS	6.644	6.556	12.524	10.092	4.996	7.084	16.64	21
NORMAL BOYS 10 YEARS	5.256	6.964	10.812	9.484	5.116	7.212	15.8	22
NORMAL BOYS 11 YEARS	8.08	11.124	12.896	8.544	4.888	7.468	16.64	23.72
NORMAL BOYS 12 YEARS	6.476	7.272	11.86	11.896	5.352	7.32	16.92	23.32
NORMAL BOYS 13 YEARS	8.388	11.884	11.22	9.376	5.628	8.136	18.12	26.44
NORMAL BOYS 14 YEARS	8.14	9.872	10.452	9.612	5.832	8.16	20.12	28.56
NORMAL GIRLS 08 YEARS	11.028	6.112	12.308	7.836	4.42	6.456	14.88	20.36
NORMAL GIRLS 09 YEARS	13.14	6.556	11.592	7.004	4.808	6.676	15.08	20.88
NORMAL GIRLS 10 YEARS	11.764	9.544	14.072	9.16	4.776	6.536	15	20.96
NORMAL GIRLS 11 YEARS	14.396	11.28	13.676	7.332	5.16	6.956	16.36	23.76
NORMAL GIRLS 12 YEARS	15.416	13.352	14.064	7.816	5.384	6.996	16.8	22.96
NORMAL GIRLS 13 YEARS	16.328	14.632	15.06	10.492	5.408	7.264	18	22.48
NORMAL GIRLS 14 YEARS	17.244	14.816	14.776	10.9	5.484	7.152	18	23.6
DEAF & DUMB BOYS 08 YEARS	5.828	8.352	8.776	5.668	4.616	7.092	15.32	20.64
DEAF & DUMB BOYS 09 YEARS	4.54	5.56	7.876	5.548	4.652	6.988	15.2	20.8
DEAF & DUMB BOYS 10 YEARS	5.24	6.376	8.748	6.524	4.916	7.532	15.28	22.36
DEAF & DUMB BOYS 11 YEARS	6.44	9.128	11.152	8.508	5.272	7.56	16.04	22.76
DEAF & DUMB BOYS 12 YEARS	4	4.404	8.648	6.124	5.452	7.652	16.04	23.56
DEAF & DUMB BOYS 13 YEARS	6.368	7.408	9.304	6.376	5.464	8.036	17	24.12
DEAF & DUMB BOYS 14 YEARS	8.06	7.952	9.756	6.756	5.708	8.012	18.64	25.92
DEAF & DUMB GIRLS 08 YEARS	9.76	8.432	9.54	6.988	4.644	6.988	15.4	21.88
DEAF & DUMB GIRLS 09 YEARS	8.708	9.084	12	7.124	4.52	6.72	15.4	21.16
DEAF & DUMB GIRLS 10 YEARS	10.928	8.884	12.656	8.16	4.568	6.884	15.4	21.56
DEAF & DUMB GIRLS 11 YEARS	11.496	6.888	11.332	10.636	4.952	7.348	16.72	23.72
DEAF & DUMB GIRLS 12 YEARS	12.576	10.272	12.616	8.972	4.98	7.572	16.96	24.16
DEAF & DUMB GIRLS 13 YEARS	13.808	12.296	12	9.456	5.108	7.336	16.88	24.4
DEAF & DUMB GIRLS 14 YEARS	15.072	13.576	14.18	10.408	5.544	7.488	17.64	24.72

Table No. IV.3: Standard Deviation of Height, Sitting Height, Weight, Scapula Skinfold, Chest Skinfold, Triceps Skinfold and Abdomen Skinfold

	Height	Sitting Height	Weight	Scapula Skinfold	Chest Skinfold	Triceps Skinfold	Abdomen Skinfold
COMPLETE	11.7	5.7	7.2	3.03	3.16	2.93	5.43
NORMAL BOYS 8-14	12.5	6.3	7.8	1.84	2.65	2.65	3.58
NORMAL GIRLS 8-14	11.8	5.4	6.2	3.28	0	2.80	5.82
DEAF & DUMB BOYS 8-14	12.3	6.0	7.3	1.25	1.61	2.21	2.70
DEAF & DUMB GIRLS 8-14	10.2	5.0	7.1	2.98	0	3.05	4.04
NORMAL BOYS 08 YEARS	5.0	2.8	2.5	0.61	1.00	1.86	1.86
NORMAL BOYS 09 YEARS	6.0	4.1	4.5	2.33	3.28	2.34	3.33
NORMAL BOYS 10 YEARS	5.9	3.0	3.5	1.06	1.97	2.00	2.06
NORMAL BOYS 11 YEARS	7.1	3.5	5.0	1.66	3.07	2.73	5.11
NORMAL BOYS 12 YEARS	5.4	3.3	3.4	1.27	1.98	2.36	2.61
NORMAL BOYS 13 YEARS	7.2	4.4	6.1	2.88	3.52	3.62	4.74
NORMAL BOYS 14 YEARS	7.6	3.7	6.7	1.20	2.10	2.84	2.29
NORMAL GIRLS 08 YEARS	5.1	2.4	2.0	2.78	0	1.91	3.76
NORMAL GIRLS 09 YEARS	6.1	2.7	4.3	2.70	0	2.64	6.73
NORMAL GIRLS 10 YEARS	5.1	2.2	3.0	2.30	0	2.65	4.14
NORMAL GIRLS 11 YEARS	5.0	2.7	3.8	2.34	0	2.31	4.69
NORMAL GIRLS 12 YEARS	7.0	3.8	3.4	2.88	0	3.40	5.27
NORMAL GIRLS 13 YEARS	3.9	2.7	3.1	4.22	0	3.47	7.71
NORMAL GIRLS 14 YEARS	6.1	3.9	5.0	3.91	0	2.79	5.13
DEAF & DUMB BOYS 08 YEARS	6.0	3.7	1.8	0.87	1.30	1.47	1.12
DEAF & DUMB BOYS 09 YEARS	10.4	5.0	4.0	0.58	1.67	1.46	1.79
DEAF & DUMB BOYS 10 YEARS	4.3	2.0	2.1	0.74	0.88	1.40	1.63
DEAF & DUMB BOYS 11 YEARS	6.9	3.7	6.1	0.87	0.97	2.08	1.76
DEAF & DUMB BOYS 12 YEARS	8.6	4.5	5.8	0.90	0.94	1.11	1.18
DEAF & DUMB BOYS 13 YEARS	5.7	4.2	3.6	1.47	1.69	1.63	2.45
DEAF & DUMB BOYS 14 YEARS	7.3	5.2	6.0	1.93	2.44	3.02	4.87
DEAF & DUMB GIRLS 08 YEARS	7.9	3.4	2.7	2.00	0	1.67	1.18
DEAF & DUMB GIRLS 09 YEARS	4.2	2.3	2	1.15	0	3.15	3.41
DEAF & DUMB GIRLS 10 YEARS	6.3	3	3.2	2.53	0	1.66	3.34
DEAF & DUMB GIRLS 11 YEARS	5.6	3.4	2.5	1.10	0	2.19	3.91
DEAF & DUMB GIRLS 12 YEARS	4.2	1.6	3.9	1.75	0	2.64	2.14
DEAF & DUMB GIRLS 13 YEARS	4.1	3.0	6.4	3.40	0	3.91	4.31
DEAF & DUMB GIRLS 14 YEARS	2.8	1.9	3.6	2.99	0	2.97	4.95

Table No. IV.4: Standard Deviation of Supra Illiac Skinfold, Thigh Skinfold, Calf Skinfold, Humerus Diameter, Femur Diameter, Biceps Girth and Calf Girth

	Supra Illac Skinfold	Thigh Skinfold	Calf Skinfold	Humerus Diameter	Femur Diameter	Biceps Girth	Calf Girth
COMPLETE	4.84	3.74	3.21	0.62	0.60	1.84	2.63
NORMAL BOYS 8-14	4.97	3.32	3.23	0.51	0.59	2.15	3.19
NORMAL GIRLS 8-14	5.84	4.10	3.47	0.47	0.53	1.96	2.33
DEAF & DUMB BOYS 8-14	2.98	2.84	2.31	0.53	0.56	1.70	2.59
DEAF & DUMB GIRLS 8-14	4.21	3.15	2.94	0.84	0.46	1.39	2.05
NORMAL BOYS 08 YEARS	2.83	1.53	1.64	0.32	0.22	0.86	1.3
NORMAL BOYS 09 YEARS	3.11	3.04	3.50	0.39	0.54	1.46	1.7
NORMAL BOYS 10 YEARS	2.69	2.34	2.44	0.31	0.30	1.58	1.52
NORMAL BOYS 11 YEARS	6.43	4.41	3.07	0.37	0.50	1.57	1.48
NORMAL BOYS 12 YEARS	3.76	3.83	3.50	0.30	0.41	1.35	1.40
NORMAL BOYS 13 YEARS	7.20	3.79	3.28	0.36	0.50	2.36	2.97
NORMAL BOYS 14 YEARS	3.38	2.46	2.64	0.34	0.26	1.56	2.10
NORMAL GIRLS 08 YEARS	2.50	3.99	2.45	0.27	0.30	1.05	1.75
NORMAL GIRLS 09 YEARS	4.00	2.84	2.65	0.41	0.28	1.46	1.69
NORMAL GIRLS 10 YEARS	4.15	3.49	2.88	0.26	0.32	1.38	1.42
NORMAL GIRLS 11 YEARS	5.16	5.34	2.38	0.24	0.37	1.28	2.16
NORMAL GIRLS 12 YEARS	4.53	3.62	4.35	0.23	0.55	1.70	2.24
NORMAL GIRLS 13 YEARS	6.82	5.41	3.71	0.29	0.62	1.91	2.23
NORMAL GIRLS 14 YEARS	5.66	2.19	3.56	0.31	0.57	1.65	2.14
DEAF & DUMB BOYS 08 YEARS	2.23	1.61	1.22	0.43	0.34	0.98	1.95
DEAF & DUMB BOYS 09 YEARS	1.95	2.04	1.41	0.39	0.43	1.22	1.93
DEAF & DUMB BOYS 10 YEARS	2.65	1.97	2.13	0.30	0.39	0.84	1.68
DEAF & DUMB BOYS 11 YEARS	2.98	3.07	1.61	0.43	0.49	1.69	2.24
DEAF & DUMB BOYS 12 YEARS	0.73	2.57	2.74	0.39	0.33	1.42	2.43
DEAF & DUMB BOYS 13 YEARS	3.02	3.13	2.05	0.27	0.50	0.81	1.36
DEAF & DUMB BOYS 14 YEARS	3.60	3.91	3.22	0.24	0.50	1.65	1.93
DEAF & DUMB GIRLS 08 YEARS	1.86	1.51	1.31	0.39	0.45	1.15	1.73
DEAF & DUMB GIRLS 09 YEARS	3.45	2.68	3.06	0.23	0.34	0.76	1.21
DEAF & DUMB GIRLS 10 YEARS	4.29	0.89	1.46	0.24	0.22	0.81	1.47
DEAF & DUMB GIRLS 11 YEARS	2.33	2.78	1.94	0.20	0.46	1.06	1.67
DEAF & DUMB GIRLS 12 YEARS	2.79	3.57	2.13	0.28	0.32	0.93	1.34
DEAF & DUMB GIRLS 13 YEARS	5.28	3.87	4.18	0.23	0.38	1.30	1.68
DEAF & DUMB GIRLS 14 YEARS	4.47	3.69	3.21	1.98	0.20	1.07	1.56

Table no. IV.5: T- Test Results comparison of body composition between normal and deaf-dumb children between 8 to 14 years

S.NO.	HEIGHT	SITTING HEIGHT	WEIGHT	SCAPULA SF	CHEST SF	TRICEP SF	ABDOMEN SF	SUPRAILLAC SF	THIGH SF	CALF SF	HUMERUS BD	FEMUR BD	BICEP MG	CALF MG
NB-DDB-8	0.85	0.33	0.02	0.07	0.0008	0.74	0.01	0.002	0.04	0.011	0.51	0.46	0.87	0.2
NB-DDB-9	0.13	0.15	0.56	0.456	0.008	0.239	0.007	0.18	0.754	0.244	0.03	0.49	0.04	0.7
NB-DDB-10	0.38	0.33	0.001	0.57	0.928	0.0001	0.97	0.44	0.001	0.36	0.02	0.002	0.15	0.4
NB-DDB-11	0.0006	0.35	0.03	0.52	0.09	0.46	0.13	0.16	0.11	0.95	0.016	0.51	0.20	0.08
NB-DDB-12	0.02	0.80	0.029	0.005	0.974	0.408	0.852	0.005	0.001	0.46	0.31	0.002	0.02	0.6
NB-DDB-13	0.02	0.07	0.006	0.27	0.008	0.0001	0.06	0.006	0.05	0.003	0.078	0.48	0.03	0.08
NB-DDB-14	0.18	0.90	0.014	0.63	0.09	0.22	0.94	0.05	0.45	0.001	0.15	0.20	0.021	0.29
NG-DDG-8	0.007	0.01	0.003	0.001	---	0.0008	0.11	0.0005	0.002	0.13	0.02	0.156	0.10	0.03
NG-DDG-9	0.26	0.70	0.13	0.03	---	0.608	0.005	0.02	0.60	0.88	0.003	0.62	0.33	0.50
NG-DDG-10	0.60	0.004	0.47	0.003	---	0.002	0.43	0.58	0.05	0.12	0.005	.051	0.21	0.15
NG-DDG-11	0.05	0.06	0.96	0.0001	---	0.115	0.02	0.0003	0.057	0.22	0.001	0.001	0.28	0.94
NG-DDG-12	0.61	0.27	0.084	0.78	---	0.85	0.01	0.005	0.16	0.23	0.162	0.45	0.68	0.026
NG-DDG-13	0.04	0.92	0.04	0.308	---	0.96	0.16	0.182	0.025	0.35	0.001	0.62	0.01	0.001
NG-DDG-14	0.13	0.39	0.012	0.814	----	0.003	0.13	0.394	0.49	0.61	0.881	0.008	0.36	0.04

Table 4.1 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the HEIGHT

Variables	**Groups**	**N**	**Mean**	**Standard Deviation**	**Mean Difference**	**Obtained Value 't'**	**Df**	**Table Value of 't'**	**Comments**
Height	NB-08	25	121.32	5.0	0.28	0.85	48	2.02	*Insignificant*
	DDB-08	25	121.60	6.0					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Boys of 08 years is 121.32 with standard deviation (5.0) and Deaf-dumb boys is 121.60 with standard deviation (6.0) and the obtained 't' value is 0.85 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.2 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NB-09	25	126.2	6.0	3.68	0.13	48	2.02	*Insignificant*
	DDB-09	25	122.52	10.4					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Boys of 09 years is 126.20 with standard deviation (6.0) and Deaf-dumb boys is 122.52 with standard deviation (10.4) and the obtained 't' value is 0.13 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.3 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NB-10	25	129.48	5.9	1.28	0.38	48	2.02	*Insignificant*
	DDB-10	25	130.76	4.3					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Boys of 10 years is 129.48 with standard deviation (5.9) and Deaf-dumb boys is 130.76 with standard deviation (4.3) and the obtained 't' value is 0.38 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.4 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NB-11	25	133.44	7.1	7.28	0.60	48	2.02	*Insignificant*
	DDB-11	25	140.72	6.9					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Boys of 11 years is 133.44 with standard deviation (7.1) and Deaf-dumb boys is 140.72 with standard deviation (6.9) and the obtained 't' value is 0.60 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.5 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NB-12	25	138.8	5.4	4.76	0.02	48	2.02	*Insignificant*
	DDB-12	25	134.04	8.6					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Boys of 12 years is 138.8 with standard deviation (5.4) and Deaf-dumb boys is 134.04 with standard deviation (8.6) and the obtained 't' value is 0.02 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.6 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NB-13	25	148.2	7.2	4.2	0.02	48	2.02	*Insignificant*
	DDB-13	25	144	5.7					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Boys of 13 years is 148.2 with standard deviation (7.2) and Deaf-dumb boys is 144 with standard deviation (5.7) and the obtained 't' value is 0.02 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.7 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NB-14	25	153.36	7.6	2.88	0.18	48	2.02	*Insignificant*
	DDB-14	25	150.48	7.3					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Boys of 14 years is 121.32 with standard deviation (5.0) and Deaf-dumb boys is 121.60 with standard deviation (6.0) and the obtained 't' value is 0.18 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.8: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NB-08	25	62.84	2.8	0.92	0.33	48	2.02	*Insignificant*
	DDB-08	25	61.92	3.7					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Boys of 08 years is 62.84 with standard deviation (2.8) and Deaf-dumb boys is 61.92 with standard deviation (3.7) and the obtained 't' value is 0.92 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.9: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NB-09	25	61.2	4.1	1.88	0.15	48	2.02	*Insignificant*
	DDB-09	25	63.08	5.0					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Boys of 09 years is 61.2 with standard deviation (4.1) and Deaf-dumb boys is 63.08 with standard deviation (5.0) and the obtained 't' value is 0.15 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.10 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NB-10	25	62.12	3.0	6.32	0.33	48	2.02	*Insignificant*
	DDB-10	25	68.44	2.0					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Boys of 10 years is 62.12 with standard deviation (3.0) and Deaf-dumb boys is 68.44 with standard deviation (2.0) and the obtained 't' value is 0.33 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.11: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NB-11	25	64.96	3.5	6.12	0.35	48	2.02	*Insignificant*
	DDB-11	25	71.08	3.7					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Boys of 11 years is 64.96 with standard deviation (3.5) and Deaf-dumb boys is 71.08 with standard deviation (3.7) and the obtained 't' value is 0.35 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.12: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NB-12	25	68.68	3.3	0.28	0.80	48	2.02	*Insignificant*
	DDB-12	25	68.96	4.5					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Boys of 12 years is 68.68 with standard deviation (3.3) and Deaf-dumb boys is 68.96 with standard deviation (4.5) and the obtained 't' value is 0.80 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.13 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NB-13	25	73.64	4.4	2.24	0.07	48	2.02	*Insignificant*
	DDB-13	25	71.4	4.2					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Boys of 13 years is 73.64 with standard deviation (4.4) and Deaf-dumb boys is 71.40 with standard deviation (4.2) and the obtained 't' value is 0.07 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.14: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NB-14	25	74.92	3.7	0.16	0.90	48	2.02	*Insignificant*
	DDB-14	25	75.08	5.2					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Boys of 14 years is 74.92 with standard deviation (3.7) and Deaf-dumb boys is 75.08 with standard deviation (5.2) and the obtained 't' value is 0.90 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.15: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NB-08	25	22	2.5	1.48	0.02	48	2.02	*Insignificant*
	DDB-08	25	20.52	1.8					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Boys of 08 years is 22 with standard deviation (2.5) and Deaf-dumb boys is 20.52 with standard deviation (1.8) and the obtained 't' value is 0.02 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.16: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NB-09	25	27.2	4.5	6.24	0.56	48	2.02	*Insignificant*
	DDB-09	25	20.96	4.0					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Boys of 09 years is 27.2 with standard deviation (4.5) and Deaf-dumb boys is 20.96 with standard deviation (4.0) and the obtained 't' value is 0.56 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.17: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NB-10	25	26.44	3.5	2.84	0.001	48	2.02	*Insignificant*
	DDB-10	25	23.6	2.1					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Boys of 10 years is 26.44 with standard deviation (3.5) and Deaf-dumb boys is 23.6 with standard deviation (2.1) and the obtained 't' value is 0.001 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.18: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NB-11	25	27.08	5.0	3.56	0.03	48	2.02	*Insignificant*
	DDB-11	25	30.64	6.1					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Boys of 11 years is 27.08 with standard deviation (5.0) and Deaf-dumb boys is 30.64 with standard deviation (6.1) and the obtained 't' value is 0.03 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.19: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NB-12	25	30.24	3.4	3.04	0.029	48	2.02	*Insignificant*
	DDB-12	25	27.2	5.8					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Boys of 12 years is 30.24 with standard deviation (3.4) and Deaf-dumb boys is 27.2 with standard deviation (5.8) and the obtained 't' value is 0.029 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.20: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NB-13	25	35.48	6.1	4.04	0.006	48	2.02	*Insignificant*
	DDB-13	25	31.44	3.6					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Boys of 13 years is 35.48 with standard deviation (6.1) and Deaf-dumb boys is 31.44 with standard deviation (3.6) and the obtained 't' value is 0.006 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.21: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NB-14	25	42.36	6.7	4.60	0.014	48	2.02	*Insignificant*
	DDB-14	25	37.76	6.0					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Boys of 14 years is 42.36 with standard deviation (6.7) and Deaf-dumb boys is 37.76 with standard deviation (6.0) and the obtained 't' value is 0.014 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.22: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NB-08	25	4.132	0.61	0.384	0.07	48	2.02	*Insignificant*
	DDB-08	25	4.516	0.87					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Boys of 08 years is 4.132 with standard deviation (0.61) and Deaf-dumb boys is 4.516 with standard deviation (0.87) and the obtained 't' value is 0.07 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.23: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NB-09	25	6.508	2.33	2.504	0.456	48	2.02	*Insignificant*
	DDB-09	25	4.004	0.58					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Boys of 09 years is 6.5.8 with standard deviation (2.33) and Deaf-dumb boys is 4.004 with standard deviation (0.58) and the obtained 't' value is 0.456 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.24: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NB-10	25	5.196	1.06	1.144	0.57	48	2.02	*Insignificant*
	DDB-10	25	4.052	0.74					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Boys of 10 years is 5.196 with standard deviation (1.06) and Deaf-dumb boys is 4.052 with standard deviation (0.74) and the obtained 't' value is 0.57 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.25: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NB-11	25	5.332	1.66	232	0.52	48	2.02	*Insignificant*
	DDB-11	25	5.1	0.87					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Boys of 11 years is 5.332 with standard deviation (1.66) and Deaf-dumb boys is 5.1 with standard deviation (0.87) and the obtained 't' value is 0.52 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.26: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NB-12	25	5.368	1.27	0.908	0.005	48	2.02	*Insignificant*
	DDB-12	25	4.46	0.90					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Boys of 12 years is 5.368 with standard deviation (1.27) and Deaf-dumb boys is 4.46 with standard deviation (0.90) and the obtained 't' value is 0.005 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.27: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NB-13	25	6.169	2.88	0.693	0.27	48	2.02	*Insignificant*
	DDB-13	25	5.476	1.47					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Boys of 13 years is 6.169 with standard deviation (2.88) and Deaf-dumb boys is 5.476 with standard deviation (1.47) and the obtained 't' value is 0.27 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.28: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NB-14	25	5.54	1.20	0.22	0.63	48	2.02	*Insignificant*
	DDB-14	25	5.32	1.93					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Boys of 14 years is 5.54 with standard deviation (1.20) and Deaf-dumb boys is 5.32 with standard deviation (1.93) and the obtained 't' value is 0.63 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.29: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the CHEST SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CHEST SKINFOLD	NB-08	25	4.312	1.002	1.172	0.008	48	2.02	*Insignificant*
	DDB-08	25	5.484	1.30					

* Significance at .05 Levels

The above table shows that the mean value of chest skinfold of Normal Boys of 08 years is 4.312 with standard deviation (1.002) and Deaf-dumb boys is 5.484 with standard deviation (1.30) and the obtained 't' value is 0.008 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.30: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the CHEST SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CHEST SKINFOLD	NB-09	25	6.864	3.2	2.032	0.008	48	2.02	*Insignificant*
	DDB-09	25	4.832	1.6					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Boys of 09 years is 6.864 with standard deviation (3.2) and Deaf-dumb boys is 4.832 with standard deviation (1.6) and the obtained 't' value is 0.008 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.31: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the CHEST SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CHEST SKINFOLD	NB-10	25	5.848	1.97	2.144	0.928	48	2.02	*Insignificant*
	DDB-10	25	3.704	0.889					

* Significance at .05 Levels

The above table shows that the mean value of chest skinfold of Normal Boys of 10 years is 5.848 with standard deviation (1.97) and Deaf-dumb boys is 3.704 with standard deviation (0.889) and the obtained 't' value is 0.928 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.32: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the CHEST SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CHEST SKINFOLD	NB-11	25	6.424	3.07	1.100	0.09	48	2.02	*Insignificant*
	DDB-11	25	5.324	0.97					

* Significance at .05 Levels

The above table shows that the mean value of chest skinfold of Normal Boys of 11 years is 6.424 with standard deviation (3.07) and Deaf-dumb boys is 5.324 with standard deviation (0.97) and the obtained 't' value is 0.09 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.33: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the CHEST SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CHEST SKINFOLD	NB-12	25	6.08	1.98	2.178	0.974	48	2.02	*Insignificant*
	DDB-12	25	3.912	0.94					

* Significance at .05 Levels

The above table shows that the mean value of chest skinfold of Normal Boys of 12 years is 6.08 with standard deviation (1.98) and Deaf-dumb boys is 3.921 with standard deviation (0.94) and the obtained 't' value is 0.974 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.34: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the CHEST SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CHEST SKINFOLD	NB-13	25	7.18	3.52	2.148	0.008	48	2.02	*Insignificant*
	DDB-13	25	5.032	1.69					

* Significance at .05 Levels

The above table shows that the mean value of chest skinfold of Normal Boys of 13 years is 7.18 with standard deviation (3.52) and Deaf-dumb boys is 5.032 with standard deviation (1.69) and the obtained 't' value is 0.008 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.35: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the CHEST SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CHEST SKINFOLD	NB-14	25	6.088	2.10	1.092	0.09	48	2.02	*Insignificant*
	DDB-14	25	4.996	2.44					

* Significance at .05 Levels

The above table shows that the mean value of chest skinfold of Normal Boys of 14 years is 6.088 with standard deviation (2.10) and Deaf-dumb boys is 4.996 with standard deviation (2.44) and the obtained 't' value is 0.09 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.36: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NB-08	25	6.68	1.86	0.036	0.74	48	2.02	*Insignificant*
	DDB-08	25	6.836	1.47					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Boys of 08 years is 6.68 with standard deviation (1.86) and Deaf-dumb boys is 6.836 with standard deviation (1.47) and the obtained 't' value is 0.74 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.37: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NB-09	25	8.936	2.34	3.332	0.239	48	2.02	*Insignificant*
	DDB-09	25	5.604	1.46					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Boys of 09 years is 8.936 with standard deviation (2.34) and Deaf-dumb boys is 5.604 with standard deviation (1.46) and the obtained 't' value is 0.239 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.38: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NB-10	25	7.47	2.008	1.99	0.0001	48	2.02	*Insignificant*
	DDB-10	25	5.48	1.402					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Boys of 10 years is 7.47 with standard deviation (2.008) and Deaf-dumb boys is 5.48 with standard deviation (5.48) and the obtained 't' value is 0.0001 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.39: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NB-11	25	8.092	2.73	0.508	0.46	48	2.02	*Insignificant*
	DDB-11	25	8.6	2.08					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Boys of 11 years is 8.092 with standard deviation (2.73) and Deaf-dumb boys is 8.6 with standard deviation (2.08) and the obtained 't' value is 0.46 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.40: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NB-12	25	8.504	2.36	4.084	0.408	48	2.02	*Insignificant*
	DDB-12	25	4.42	1.11					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Boys of 12 years is 8.504 with standard deviation (2.36) and Deaf-dumb boys is 4.42 with standard deviation (1.11) and the obtained 't' value is 0.408 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.41: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NB-13	25	8.768	3.62	3.364	0.0001	48	2.02	*Insignificant*
	DDB-13	25	5.404	1.63					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Boys of 13 years is 8.768 with standard deviation (3.62) and Deaf-dumb boys is 5.404 with standard deviation (1.63) and the obtained 't' value is 0.0001 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.42: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NB-14	25	7.9	2.84	1.020	0.22	48	2.02	*Insignificant*
	DDB-14	25	6.88	3.02					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Boys of 14 years is 7.9 with standard deviation (2.84) and Deaf-dumb boys is 6.88 with standard deviation (3.02) and the obtained 't' value is 0.22 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.43: 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	*Insignificant*
	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 4.44: 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 SKINFOLD	NB-09	25	6.644	3.33	2.104	0.007	48	2.02	*Insignificant*
	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 4.45: 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	*Insignificant*
	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 4.46: 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	*Insignificant*
	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 4.47: 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	*Insignificant*
	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 4.48: 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	*Insignificant*
	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 4.49: 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	*Insignificant*
	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

Table 4.50: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NB-08	25	6.056	2.83	2.296	0.002	48	2.02	*Insignificant*
	DDB-08	25	8.352	2.23					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Boys of 08 years is 6.056 with standard deviation (2.83) and Deaf-dumb boys is 8.352 with standard deviation (2.23) and the obtained 't' value is 0.002 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.51: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NB-09	25	6.556	3.11	0.96	0.18	48	2.02	*Insignificant*
	DDB-09	25	5.56	1.95					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Boys of 09 years is 6.556 with standard deviation (3.11) and Deaf-dumb boys is 5.56 with standard deviation (1.95) and the obtained 't' value is 0.18 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.52: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NB-10	25	6.96	2.69	0.59	0.44	48	2.02	*Insignificant*
	DDB-10	25	6.37	2.65					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Boys of 10 years is 6.96 with standard deviation (2.69) and Deaf-dumb boys is 6.37 with standard deviation (2.65) and the obtained 't' value is 0.44 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.53: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NB-11	25	11.124	6.43	1.996	0.16	48	2.02	*Insignificant*
	DDB-11	25	9.128	2.98					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Boys of 11 years is 11.124 with standard deviation (6.43) and Deaf-dumb boys is 9.128 with standard deviation (2.98) and the obtained 't' value is 0.16 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.54: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NB-12	25	7.27	3.76	3.23	0.005	48	2.02	*Insignificant*
	DDB-12	25	4.04	0.73					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Boys of 12 years is 7.27 with standard deviation (3.76) and Deaf-dumb boys is 4.04 with standard deviation (0.73) and the obtained 't' value is 0.005 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.55: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NB-13	25	11.88	7.20	4.48	0.006	48	2.02	*Insignificant*
	DDB-13	25	7.40	3.02					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Boys of 13 years is 11.88 with standard deviation (7.20) and Deaf-dumb boys is 7.40 with standard deviation (3.02) and the obtained 't' value is 0.006 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.56: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NB-14	25	9.87	3.38	1.92	0.05	48	2.02	*Insignificant*
	DDB-14	25	7.95	3.60					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Boys of 14 years is 9.87 with standard deviation (3.38) and Deaf-dumb boys is 7.95 with standard deviation (7.95) and the obtained 't' value is 0.05 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.57: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Commen
THIGH SKINFOLD	NB-08	25	9.696	1.53	0.920	0.04	48	2.02	*Insignific*
	DDB-08	25	8.776	1.61					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Boys of 08 years is 9.696 with standard deviation (1.53) and Deaf-dumb boys is 8.776 with standard deviation (1.61) and the obtained 't' value is 0.04 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.58: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NB-09	25	12.524	3.04	4.648	0.754	48	2.02	*Insignificant*
	DDB-09	25	7.876	2.04					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Boys of 09 years is 12.524 with standard deviation (3.04) and Deaf-dumb boys is 7.876 with standard deviation (2.04) and the obtained 't' value is 0.754 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.59: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NB-10	25	10.812	2.34	1.064	0.001	48	2.02	*Insignificant*
	DDB-10	25	8.748	1.97					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Boys of 10 years is 10.812 with standard deviation (2.34) and Deaf-dumb boys is 8.748 with standard deviation (1.97) and the obtained 't' value is 0.001 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.60: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NB-11	25	12.896	4.41	0.744	0.11	48	2.02	*Insignificant*
	DDB-11	25	11.152	3.07					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Boys of 11 years is 12.896 with standard deviation (4.41) and Deaf-dumb boys is 11.152 with standard deviation (3.07) and the obtained 't' value is 0.11 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.61: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NB-12	25	11.86	3.83	3.22	0.001	48	2.02	*Insignificant*
	DDB-12	25	8.648	2.57					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Boys of 12 years is 11.86 with standard deviation (3.83) and Deaf-dumb boys is 8.648 with standard deviation (2.57) and the obtained 't' value is 0.0001 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.62: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NB-13	25	11.22	3.79	1.92	0.05	48	2.02	*Insignificant*
	DDB-13	25	9.304	3.13					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Boys of 13 years is 11.22 with standard deviation (3.79) and Deaf-dumb boys is 9.304 with standard deviation (3.13) and the obtained 't' value is 0.05 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.63: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NB-14	25	10.452	2.46	0.696	0.45	48	2.02	*Insignificant*
	DDB-14	25	9.756	3.91					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Boys of 14 years is 10.452 with standard deviation (2.46) and Deaf-dumb boys is 9.756 with standard deviation (3.91) and the obtained 't' value is 0.45 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.64: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NB-08	25	6.752	1.64	0.84	0.011	48	2.02	*Insignificant*
	DDB-08	25	5.668	1.22					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Boys of 08 years is 6.752 with standard deviation (1.64) and Deaf-dumb boys is 5.668 with standard deviation (1.22) and the obtained 't' value is 0.11 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.65: Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NB-09	25	10.092	3.50	4.444	0.244	48	2.02	*Insignificant*
	DDB-09	25	5.548	1.41					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Boys of 09 years is 10.092 with standard deviation (3.50) and Deaf-dumb boys is 5.548 with standard deviation (1.41) and the obtained 't' value is 0.244 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.66 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NB-10	25	9.484	2.44	2.960	0.36	48	2.02	*Insignificant*
	DDB-10	25	6.524	2.13					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Boys of 10 years is 9.484 with standard deviation (2.44) and Deaf-dumb boys is 6.524 with standard deviation (2.13) and the obtained 't' value is 0.36 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.67 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NB-11	25	8.544	3.04	0.036	0.95	48	2.02	*Insignificant*
	DDB-11	25	8.508	1.61					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Boys of 11 years is 8.544 with standard deviation (3.04) and Deaf-dumb boys is 8.508 with standard deviation (1.61) and the obtained 't' value is 0.95 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.68 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NB-12	25	11.896	3.50	5.772	0.46	48	2.02	*Insignificant*
	DDB-12	25	6.124	2.747					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Boys of 12 years is 11.896 with standard deviation (3.50) and Deaf-dumb boys is 6.124 with standard deviation (2.747) and the obtained 't' value is 0.46 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.69 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NB-13	25	9.376	3.28	3.0	0.003	48	2.02	*Insignificant*
	DDB-13	25	6.376	2.05					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Boys of 13 years is 9.376 with standard deviation (3.28) and Deaf-dumb boys is 6.376 with standard deviation (2.05) and the obtained 't' value is 0.003 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.70 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NB-14	25	9.612	2.64	2.856	0.001	48	2.02	*Insignificant*
	DDB-14	25	6.756	3.22					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Boys of 14 years is 9.612 with standard deviation (2.64) and Deaf-dumb boys is 6.756 with standard deviation (3.22) and the obtained 't' value is 0.001 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.71 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NB-08	25	4.688	0.321	0.072	0.51	48	2.02	*Insignificant*
	DDB-08	25	4.616	0.439					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Boys of 08 years is 4.688 with standard deviation (0.321) and Deaf-dumb boys is 4.616 with standard deviation (0.439) and the obtained 't' value is 0.51 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.72 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NB-09	25	4.996	0.392	0.344	0.03	48	2.02	*Insignificant*
	DDB-09	25	4.652	0.393					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Boys of 09 years is 4.996 with standard deviation (0.392) and Deaf-dumb boys is 4.652 with standard deviation (0.393) and the obtained 't' value is 0.03 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.73 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NB-10	25	5.116	0.310	0.200	0.02	48	2.02	*Insignificant*
	DDB-10	25	4.916	0.364					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Boys of 10 years is 5.116 with standard deviation (0.310) and Deaf-dumb boys is 4.916 with standard deviation (0.364) and the obtained 't' value is 0.02 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.74 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NB-11	25	4.888	0.376	0.384	0.016	48	2.02	*Insignificant*
	DDB-11	25	5.272	0.434					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Boys of 11 years is 4.888 with standard deviation (0.376) and Deaf-dumb boys is 5.272 with standard deviation (0.434) and the obtained 't' value is 0.016 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.75 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NB-12	25	5.352	0.30	0.100	0.31	48	2.02	*Insignificant*
	DDB-12	25	5.452	0.39					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Boys of 12 years is 5.352 with standard deviation (0.30) and Deaf-dumb boys is 5.452 with standard deviation (0.39) and the obtained 't' value is 0.31 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.76 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NB-13	25	5.628	0.364	0.164	0.078	48	2.02	*Insignificant*
	DDB-13	25	5.464	0.275					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Boys of 13 years is 5.628 with standard deviation (0.364) and Deaf-dumb boys is 5.464 with standard deviation (0.275) and the obtained 't' value is 0.078 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.77 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NB-14	25	5.832	0.34	0.124	0.15	48	2.02	*Insignificant*
	DDB-14	25	5.708	0.24					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Boys of 14 years is 5.832 with standard deviation (0.34) and Deaf-dumb boys is 5.708 with standard deviation (0.24) and the obtained 't' value is 0.15 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.78 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NB-08	25	7.032	0.22	0.060	0.46	48	2.02	*Insignificant*
	DDB-08	25	7.092	0.34					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Boys of 08 years is 7.032 with standard deviation (0.22) and Deaf-dumb boys is 7.092 with standard deviation (0.34) and the obtained 't' value is 0.46 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.79 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NB-09	25	7.084	0.543	0.096	0.49	48	2.02	*Insignificant*
	DDB-09	25	6.988	0.438					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Boys of 09 years is 7.084 with standard deviation (0.543) and Deaf-dumb boys is 6.988 with standard deviation (0.438) and the obtained 't' value is 0.49 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.80 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NB-10	25	7.212	0.303	0.322	0.002	48	2.02	*Insignificant*
	DDB-10	25	7.532	0.390					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Boys of 10 years is 7.212 with standard deviation (0.303) and Deaf-dumb boys is 7.532 with standard deviation (0.390) and the obtained 't' value is 0.002 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.81 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NB-11	25	7.468	0.502	0.092	0.51	48	2.02	*Insignificant*
	DDB-11	25	7.56	0.494					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Boys of 11 years is 7.468 with standard deviation (0.502) and Deaf-dumb boys is 7.560 with standard deviation (0.494) and the obtained 't' value is 0.51 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.82 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NB-12	25	7.320	0.412	0.332	0.002	48	2.02	*Insignificant*
	DDB-12	25	7.652	0.334					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Boys of 12 years is 7.320 with standard deviation (0.412) and Deaf-dumb boys is 7.652 with standard deviation (0.334) and the obtained 't' value is 0.002 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.83 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NB-13	25	8.136	0.50	0.100	0.48	48	2.02	*Insignificant*
	DDB-13	25	8.036	0.50					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Boys of 13 years is 8.136 with standard deviation (0.50) and Deaf-dumb boys is 8.036 with standard deviation (0.50) and the obtained 't' value is 0.48 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.84 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NB-14	25	8.16	0.26	0.148	0.20	48	2.02	*Insignificant*
	DDB-14	25	8.012	0.50					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Boys of 14 years is 8.16 with standard deviation (0.26) and Deaf-dumb boys is 8.012 with standard deviation (0.50) and the obtained 't' value is 0.20 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.85 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NB-08	25	15.36	0.86	0.04	0.87	48	2.02	*Insignificant*
	DDB-08	25	15.32	0.98					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Boys of 08 years is 15.36 with standard deviation (0.86) and Deaf-dumb boys is 15.32 with standard deviation (0.98) and the obtained 't' value is 0.87 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.86 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NB-09	25	16.64	1.46	1.44	0.04	48	2.02	*Insignificant*
	DDB-09	25	15.20	1.22					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Boys of 09 years is 16.64 with standard deviation (1.46) and Deaf-dumb boys is 15.20 with standard deviation (1.22) and the obtained 't' value is 0.04 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.87 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NB-10	25	15.80	1.58	0.52	0.15	48	2.02	*Insignificant*
	DDB-10	25	15.28	0.84					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Boys of 10 years is 15.80 with standard deviation (1.58) and Deaf-dumb boys is 15.28 with standard deviation (0.84) and the obtained 't' value is 0.15 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.88 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NB-11	25	16.64	1.57	0.60	0.20	48	2.02	*Insignificant*
	DDB-11	25	16.04	1.69					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Boys of 11 years is 16.64 with standard deviation (1.57) and Deaf-dumb boys is 16.04 with standard deviation (1.69) and the obtained 't' value is 0.85 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.89 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NB-12	25	16.92	1.35	0.88	0.02	48	2.02	*Insignificant*
	DDB-12	25	16.04	1.42					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Boys of 12 years is 16.92 with standard deviation (1.35) and Deaf-dumb boys is 16.04 with standard deviation (1.42) and the obtained 't' value is 0.02 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.90 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NB-13	25	18.12	2.36	1.12	0.03	48	2.02	*Insignificant*
	DDB-13	25	17.0	0.81					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Boys of 13 years is 18.12 with standard deviation (2.36) and Deaf-dumb boys is 17.0 with standard deviation (0.81) and the obtained 't' value is 0.03 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.91 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NB-14	25	20.12	1.56	1.48	0.021	48	2.02	*Insignificant*
	DDB-14	25	18.64	1.65					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Boys of 14 years is 20.12 with standard deviation (1.56) and Deaf-dumb boys is 18.64 with standard deviation (1.65) and the obtained 't' value is 0.021 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.92 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 08 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NB-08	25	21.24	1.3	0.60	0.2	48	2.02	*Insignificant*
	DDB-08	25	20.64	1.95					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Boys of 08 years is 21.24 with standard deviation (1.3) and Deaf-dumb boys is 20.64 with standard deviation (1.95) and the obtained 't' value is 0.20 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.93 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 09 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NB-09	25	21	1.77	0.20	0.7	48	2.02	*Insignificant*
	DDB-09	25	20.8	1.93					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Boys of 09 years is 21 with standard deviation (1.77) and Deaf-dumb boys is 20.8 with standard deviation (1.93) and the obtained 't' value is 0.70 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.94 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 10 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NB-10	25	22	1.52	0.36	0.4	48	2.02	*Insignificant*
	DDB-10	25	22.36	1.68					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Boys of 10 years is 22 with standard deviation (1.52) and Deaf-dumb boys is 22.36 with standard deviation (1.68) and the obtained 't' value is 0.40 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.95 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 11 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NB-11	25	23.72	1.48	0.96	0.08	48	2.02	*Insignificant*
	DDB-11	25	22.76	2.24					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Boys of 11 years is 23.72 with standard deviation (1.48) and Deaf-dumb boys is 22.76 with standard deviation (2.24) and the obtained 't' value is 0.08 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.96 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 12 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NB-12	25	23.32	1.40	0.24	0.6	48	2.02	*Insignificant*
	DDB-12	25	23.56	2.43					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Boys of 12 years is 23.32 with standard deviation (1.40) and Deaf-dumb boys is 23.56 with standard deviation (2.43) and the obtained 't' value is 0.60 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.97 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 13 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NB-13	25	26.44	2.97	2.32	0.08	48	2.02	*Insignificant*
	DDB-13	25	24.12	1.36					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Boys of 13 years is 26.44 with standard deviation (2.97) and Deaf-dumb boys is 24.12 with standard deviation (1.36) and the obtained 't' value is 0.08 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.98 Showing the comparison of the mean scores and 't' value of the **Normal Boys and Deaf-dumb boys 14 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NB-14	25	28.56	2.10	2.64	0.29	48	2.02	*Insignificant*
	DDB-14	25	25.92	1.93					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Boys of 14 years is 28.56 with standard deviation (2.10) and Deaf-dumb boys is 25.92 with standard deviation (1.93) and the obtained 't' value is 0.29 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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Table 4.99 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
Height	NG-08	25	118.36	5.1	5.28	0.007	48	2.02	*Insignificant*
	DDG-08	25	123.64	7.9					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Girls of 08 years is 118.36 with standard deviation (5.1) and Deaf-dumb Girls is 123.64 with standard deviation (7.9) and the obtained 't' value is 0.007 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.100 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NG-09	25	125.36	6.1	1.68	0.26	48	2.02	*Insignificant*
	DDG-09	25	123.68	4.2					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Girls of 09 years is 125.36 with standard deviation (6.1) and Deaf-dumb Girls is 123.68 with standard deviation (4.2) and the obtained 't' value is 0.26 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.101 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NG-10	25	126.92	5.1	0.84	0.60	48	2.02	*Insignificant*
	DDG-10	25	127.76	6.3					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Girls of 10 years is 126.92 with standard deviation (5.1) and Deaf-dumb Girls is 127.76 with standard deviation (6.3) and the obtained 't' value is 0.60 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.102 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NG-11	25	134.56	5.0	3.00	0.05	48	2.02	*Insignificant*
	DDG-11	25	137.56	5.6					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Girls of 11 years is 134.56 with standard deviation (5.0) and Deaf-dumb Girls is 137.56 with standard deviation (5.6) and the obtained 't' value is 0.05 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.103 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NG-12	25	143.04	7.0	0.84	0.61	48	2.02	*Insignificant*
	DDG-12	25	142.2	4.2					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Girls of 12 years is 143.04 with standard deviation (7.0) and Deaf-dumb Girls is 142.2 with standard deviation (4.2) and the obtained 't' value is 0.61 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.104 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NG-13	25	145.44	3.9	2.36	0.04	48	2.02	*Insignificant*
	DDG-13	25	143.08	4.1					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Girls of 13 years is 145.44 with standard deviation (3.9) and Deaf-dumb Girls is 143.08 with standard deviation (4.1) and the obtained 't' value is 0.04 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.105 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HEIGHT	NG-14	25	147.4	6.1	2.18	0.13	48	2.02	*Insignificant*
	DDG-14	25	145.32	2.8					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Girls of 14 years is 147.4 with standard deviation (6.1) and Deaf-dumb Girls is 145.32 with standard deviation (2.8) and the obtained 't' value is 0.13 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.106 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NG-08	25	62.12	2.4	2.16	0.01	48	2.02	*Insignificant*
	DDG-08	25	64.28	3.4					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Girls of 08 years is 62.12 with standard deviation (2.4) and Deaf-dumb Girls is 64.28 with standard deviation (3.4) and the obtained 't' value is 0.01 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.107 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NG-09	25	64.04	2.7	0.28	0.70	48	2.02	*Insignificant*
	DDG-09	25	63.76	2.3					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Girls of 09 years is 64.04 with standard deviation (2.7) and Deaf-dumb Girls is 63.76 with standard deviation (2.3) and the obtained 't' value is 0.70 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.108 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NG-10	25	63.56	2.2	2.24	0.004	48	2.02	*Insignificant*
	DDG-10	25	65.80	3.0					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Girls of 10 years is 63.56 with standard deviation (2.2) and Deaf-dumb Girls is 65.80 with standard deviation (3.0) and the obtained 't' value is 0.004 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.109 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NG-11	25	68	2.7	1.64	0.06	48	2.02	*Insignificant*
	DDG-11	25	69.64	3.4					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Girls of 11 years is 68 with standard deviation (2.7) and Deaf-dumb Girls is 69.64 with standard deviation (3.4) and the obtained 't' value is 0.06 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.110 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NG-12	25	71.76	3.8	0.92	0.27	48	2.02	*Insignificant*
	DDG-12	25	72.68	1.6					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Girls of 12 years is 71.76 with standard deviation (3.8) and Deaf-dumb Girls is 72.68 with standard deviation (1.6) and the obtained 't' value is 0.27 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.111 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NG-13	25	72.92	2.7	0.08	0.92	48	2.02	*Insignificant*
	DDG-13	25	73	3.0					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Girls of 13 years is 72.92 with standard deviation (2.7) and Deaf-dumb Girls is 73 with standard deviation (3.0) and the obtained 't' value is 0.92 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.112 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the SITTING HEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SITTING HEIGHT	NG-14	25	74.12	3.9	0.76	0.39	48	2.02	*Insignificant*
	DDG-14	25	74.88	1.9					

* Significance at .05 Levels

The above table shows that the mean value of sitting height of Normal Girls of 14 years is 74.12 with standard deviation (3.9) and Deaf-dumb Girls is 74.88 with standard deviation (1.9) and the obtained 't' value is 0.39 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.113 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NG-08	25	19.28	2.0	2.16	0.003	48	2.02	*Insignificant*
	DDG-08	25	21.44	2.7					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Girls of 08 years is 19.28 with standard deviation (2.0) and Deaf-dumb Girls is 21.44 with standard deviation (2.7) and the obtained 't' value is 0.003 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.114 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NG-09	25	22.08	4.3	1.48	0.13	48	2.02	*Insignificant*
	DDG-09	25	20.6	2.0					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Girls of 09 years is 22.08 with standard deviation (4.3) and Deaf-dumb Girls is 20.60 with standard deviation (2.0) and the obtained 't' value is 0.13 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.115 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NG-10	25	22.64	3.0	1.04	0.47	48	2.02	*Insignificant*
	DDG-10	25	23.68	3.2					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Girls of 10 years is 22.64 with standard deviation (3.0) and Deaf-dumb Girls is 23.68 with standard deviation (3.2) and the obtained 't' value is 0.47 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.116 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NG-11	25	27.08	3.8	0.04	0.96	48	2.02	*Insignificant*
	DDG-11	25	27.04	2.5					

* Significance at .05 Levels

The above table shows that the mean value of height of Normal Girls of 11 years is 27.08 with standard deviation (3.8) and Deaf-dumb Girls is 27.04 with standard deviation (2.5) and the obtained 't' value is 0.96 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.117 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NG-12	25	30.96	3.4	1.84	0.084	48	2.02	*Insignificant*
	DDG-12	25	32.80	3.9					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Girls of 12 years is 30.96 with standard deviation (3.4) and Deaf-dumb Girls is 32.80 with standard deviation (3.9) and the obtained 't' value is 0.084 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.118 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NG-13	25	31.0	3.1	2.86	0.04	48	2.02	*Insignificant*
	DDG-13	25	33.96	6.4					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Girls of 13 years is 31.0 with standard deviation (3.1) and Deaf-dumb Girls is 33.96 with standard deviation (6.4) and the obtained 't' value is 0.04 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.119 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the WEIGHT

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
WEIGHT	NG-14	25	33.56	5.0	3.34	0.012	48	2.02	*Insignificant*
	DDG-14	25	36.80	3.6					

* Significance at .05 Levels

The above table shows that the mean value of weight of Normal Girls of 14 years is 33.56 with standard deviation (5.0) and Deaf-dumb Girls is 36.80 with standard deviation (3.6) and the obtained 't' value is 0.012 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.120 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NG-08	25	7.7	2.7	2.26	0.001	48	2.02	*Insignificant*
	DDG-08	25	5.44	2.0					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Girls of 08 years is 7.7 with standard deviation (2.7) and Deaf-dumb Girls is 5.44 with standard deviation (2.0) and the obtained 't' value is 0.001 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.121 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NG-09	25	7.808	2.7	0.288	0.03	48	2.02	*Insignificant*
	DDG-09	25	6.52	1.15					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Girls of 09 years is 7.808 with standard deviation (2.7) and Deaf-dumb Girls is 6.52 with standard deviation (1.15) and the obtained 't' value is 0.03 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.122 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NG-10	25	8.624	2.30	1.136	0.003	48	2.02	*Insignificant*
	DDG-10	25	6.488	2.53					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Girls of 10 years is 8.624 with standard deviation (2.30) and Deaf-dumb Girls is 6.488 with standard deviation (2.53) and the obtained 't' value is 0.003 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.123 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NG-11	25	8.764	2.34	2.132	0.0001	48	2.02	*Insignificant*
	DDG-11	25	6.632	1.10					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Girls of 11 years is 8.764 with standard deviation (2.34) and Deaf-dumb Girls is 6.632 with standard deviation (1.10) and the obtained 't' value is 0.0001 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.124 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NG-12	25	9.496	2.88	2.944	0.78	48	2.02	*Insignificant*
	DDG-12	25	6.552	1.75					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Girls of 12 years is 9.496 with standard deviation (2.88) and Deaf-dumb Girls is 6.552 with standard deviation (1.75) and the obtained 't' value is 0.78 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.125 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NG-13	25	10.392	4.22	1.116	0.308	48	2.02	*Insignificant*
	DDG-13	25	9.276	3.40					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Girls of 13 years is 10.392 with standard deviation (4.22) and Deaf-dumb Girls is 9.276 with standard deviation (3.40) and the obtained 't' value is 0.308 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.126 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the SCAPULA SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SCAPULA SKINFOLD	NG-14	25	11.268	3.91	0.232	0.814	48	2.02	*Insignificant*
	DDG-14	25	11.500	2.99					

* Significance at .05 Levels

The above table shows that the mean value of scapula skinfold of Normal Girls of 14 years is 11.268 with standard deviation (3.91) and Deaf-dumb Girls is 11.50 with standard deviation (2.99) and the obtained 't' value is 0.814 with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.127 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NG-08	25	8.824	1.91	1.816	0.0008	48	2.02	*Insignificant*
	DDG-08	25	7.008	1.67					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Girls of 08 years is 8.824 with standard deviation (1.91) and Deaf-dumb Girls is 7.008 with standard deviation (1.67) and the obtained 't' value is 0.0008 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.128 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NG-09	25	8.424	2.64	0.424	0.608	48	2.02	*Insignificant*
	DDG-09	25	8.000	3.15					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Girls of 09 years is 8.424 with standard deviation (2.64) and Deaf-dumb Girls is 8.00 with standard deviation (3.15) and the obtained 't' value is 0.6.8 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.129 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NG-10	25	10.336	2.65	1.992	0.002	48	2.02	*Insignificant*
	DDG-10	25	8.344	1.66					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Girls of 10 years is 10.336 with standard deviation (2.65) and Deaf-dumb Girls is 8.344 with standard deviation (1.66) and the obtained 't' value is 0.002 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.130 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NG-11	25	9.176	2.31	1.024	0.115	48	2.02	*Insignificant*
	DDG-11	25	10.2	2.19					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Girls of 11 years is 9.176 with standard deviation (2.31) and Deaf-dumb Girls is 10.2 with standard deviation (2.19) and the obtained 't' value is 0.115 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.131 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NG-12	25	8.856	3.40	0.164	0.85	48	2.02	*Insignificant*
	DDG-12	25	9.02	2.64					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Girls of 12 years is 8.856 with standard deviation (3.40) and Deaf-dumb Girls is 9.02 with standard deviation (2.64) and the obtained 't' value is 0.85 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.132 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NG-13	25	8.92	3.47	0.052	0.96	48	2.02	*Insignificant*
	DDG-13	25	8.972	3.91					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Girls of 13 years is 8.92 with standard deviation (3.47) and Deaf-dumb Girls is 8.972 with standard deviation (3.91) and the obtained 't' value is 0.052 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.133 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the TRICEPS SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
TRICEPS SKINFOLD	NG-14	25	8.784	2.79	3.152	0.003	48	2.02	*Insignificant*
	DDG-14	25	11.936	2.97					

* Significance at .05 Levels

The above table shows that the mean value of triceps skinfold of Normal Girls of 14 years is 8.784 with standard deviation (2.79) and Deaf-dumb Girls is 11.936 with standard deviation (2.97) and the obtained 't' value is 0.003 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.134 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 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	NG-08	25	11.028	3.76	1.268	0.11	48	2.02	*Insignificant*
	DDG-08	25	9.76	1.18					

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Girls of 08 years is 11.028 with standard deviation (3.76) and Deaf-dumb Girls is 9.76 with standard deviation (1.18) and the obtained 't' value is 0.11 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.135 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the ABDOMEN SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
ABDOMEN SKINFOLD	NG-09	25	13.14	6.73	4.432	0.005	48	2.02	*Insignificant*
	DDG-09	25	8.708	3.41					

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Girls of 09 years is 13.14 with standard deviation (6.73) and Deaf-dumb Girls is 8.708 with standard deviation (3.41) and the obtained 't' value is 0.005 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.136 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 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	NG-10	25	11.764	4.14	0.836	0.43	48	2.02	*Insignificant*
	DDG-10	25	10.928	3.34					

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Girls of 10 years is 11.764 with standard deviation (4.14) and Deaf-dumb Girls is 10.928 with standard deviation (3.34) and the obtained 't' value is 0.43 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.137 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 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	NG-11	25	14.396	4.69	2.900	0.02	48	2.02	*Insignificant*
	DDG-11	25	11.496	3.91					

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Girls of 11 years is 14.396 with standard deviation (4.69) and Deaf-dumb Girls is 11.496 with standard deviation (3.91) and the obtained 't' value is 0.02 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.138 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 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	NG-12	25	15.416	5.27	2.840	0.01	48	2.02	*Insignificant*
	DDG-12	25	12.576	2.14					

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Girls of 12 years is 15.416 with standard deviation (5.27) and Deaf-dumb Girls is 12.576 with standard deviation (2.14) 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 4.139 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 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	NG-13	25	16.328	7.71	2.520	0.16	48	2.02	*Insignificant*
	DDG-13	25	13.808	4.31					

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Girls of 13 years is 16.328 with standard deviation (7.71) and Deaf-dumb Girls is 13.808 with standard deviation (4.31) and the obtained 't' value is 0.16 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.140 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 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	NG-14	25	17.244	5.13	1.172	0.13	48	2.02	*Insignificant*
	DDG-14	25	15.072	4.95					

* Significance at .05 Levels

The above table shows that the mean value of abdomen skinfold of Normal Girls of 14 years is 17.244 with standard deviation (5.13) and Deaf-dumb Girls is 15.072 with standard deviation (4.95) 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 4.141 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NG-08	25	6.112	2.50	2.320	0.0005	48	2.02	*Insignificant*
	DDG-08	25	8.432	1.86					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Girls of 08 years is 6.112 with standard deviation (2.50) and Deaf-dumb Girls is 8.432 with standard deviation (1.86) and the obtained 't' value is 0.0005 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.142 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NG-09	25	6.556	4.0	2.528	0.02	48	2.02	*Insignificant*
	DDG-09	25	9.084	3.45					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Girls of 09 years is 6.556 with standard deviation (4.0) and Deaf-dumb Girls is 9.084 with standard deviation (3.45) and the obtained 't' value is 0.02 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.143 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NG-10	25	9.544	4.15	0.660	0.58	48	2.02	*Insignificant*
	DDG-10	25	8.884	4.29					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Girls of 10 years is 9.544 with standard deviation (4.15) and Deaf-dumb Girls is 8.884 with standard deviation (4.29) and the obtained 't' value is 0.58 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.144 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NG-11	25	11.28	5.16	4.400	0.0003	48	2.02	*Insignificant*
	DDG-11	25	6.888	2.33					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Girls of 11 years is 11.28 with standard deviation (5.16) and Deaf-dumb Girls is 6.888 with standard deviation (2.33) and the obtained 't' value is 0.0003 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.145 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NG-12	25	13.352	4.53	3.080	0.005	48	2.02	*Insignificant*
	DDG-12	25	10.272	2.79					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Girls of 12 years is 13.352 with standard deviation (4.53) and Deaf-dumb Girls is 10.272 with standard deviation (2.79) and the obtained 't' value is 0.005 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.146 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NG-13	25	14.632	6.82	2.336	0.182	48	2.02	*Insignificant*
	DDG-13	25	12.296	5.28					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Girls of 13 years is 14.632 with standard deviation (6.82) and Deaf-dumb Girls is 12.296 with standard deviation (5.28) and the obtained 't' value is 0.182 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.147 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the SUPRAILLIAC SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
SUPRAILLIAC SKINFOLD	NG-14	25	14.816	5.66	1.240	0.394	48	2.02	*Insignificant*
	DDG-14	25	13.576	4.47					

* Significance at .05 Levels

The above table shows that the mean value of Supraillac Skinfold of Normal Girls of 14 years is 14.816 with standard deviation (5.66) and Deaf-dumb Girls is 13.576 with standard deviation (4.47) and the obtained 't' value is 0.394 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.148 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NG-08	25	12.308	3.99	2.768	0.002	48	2.02	*Insignificant*
	DDG-08	25	9.54	1.51					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Girls of 08 years is 12.308 with standard deviation (3.99) and Deaf-dumb Girls is 9.54 with standard deviation (1.51) and the obtained 't' value is 0.002 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.149 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NG-09	25	11.592	2.84	0.408	0.60	48	2.02	*Insignificant*
	DDG-09	25	12.00	2.68					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Girls of 09 years is 11.592 with standard deviation (2.84) and Deaf-dumb Girls is 12.00 with standard deviation (2.68) and the obtained 't' value is 0.60 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.150 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NG-10	25	14.072	3.49	1.416	0.05	48	2.02	*Insignificant*
	DDG-10	25	12.656	0.893					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Girls of 10 years is 14.072 with standard deviation (3.49) and Deaf-dumb Girls is 12.656 with standard deviation (0.893) and the obtained 't' value is 0.05 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.151 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NG-11	25	13.676	5.34	2.344	0.057	48	2.02	*Insignificant*
	DDG-11	25	11.332	2.78					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Girls of 11 years is 13.676 with standard deviation (5.34) and Deaf-dumb Girls is 11.332 with standard deviation (2.78) and the obtained 't' value is 0.057 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.152 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NG-12	25	14.064	3.62	1.448	0.16	48	2.02	*Insignificant*
	DDG-12	25	12.616	3.57					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Girls of 12 years is 14.064 with standard deviation (3.62) and Deaf-dumb Girls is 12.616 with standard deviation (3.57) and the obtained 't' value is 0.16 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.153 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NG-13	25	15.06	5.41	2.56	0.025	48	2.02	*Insignificant*
	DDG-13	25	12.0	3.87					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Girls of 13 years is 15.06 with standard deviation (5.41) and Deaf-dumb Girls is 12.0 with standard deviation (3.87) and the obtained 't' value is 0.025 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.154 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the THIGH SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
THIGH SKINFOLD	NG-14	25	14.776	2.19	0.596	0.49	48	2.02	*Insignificant*
	DDG-14	25	14.18	3.69					

* Significance at .05 Levels

The above table shows that the mean value of Thigh Skinfold of Normal Girls of 14 years is 14.776 with standard deviation (2.19) and Deaf-dumb Girls is 14.18 with standard deviation (3.69) and the obtained 't' value is 0.49 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.155 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NG-08	25	7.836	2.45	0.848	0.13	48	2.02	*Insignificant*
	DDG-08	25	6.988	1.31					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Girls of 08 years is 7.836 with standard deviation (2.45) and Deaf-dumb Girls is 6.988 with standard deviation (1.31) 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 4.156 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NG-09	25	7.004	2.65	0.120	0.88	48	2.02	*Insignificant*
	DDG-09	25	7.124	3.06					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Girls of 09 years is 7.004 with standard deviation (2.65) and Deaf-dumb Girls is 7.124 with standard deviation (3.06) and the obtained 't' value is 0.88 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.157 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NG-10	25	9.16	2.88	1.00	0.12	48	2.02	*Insignificant*
	DDG-10	25	8.16	1.46					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Girls of 10 years is 9.16 with standard deviation (2.88) and Deaf-dumb Girls is 8.16 with standard deviation (1.46) and the obtained 't' value is 0.12 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.158 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NG-11	25	7.332	2.38	3.304	0.22	48	2.02	*Insignificant*
	DDG-11	25	10.636	1.94					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Girls of 11 years is 7.332 with standard deviation (2.38) and Deaf-dumb Girls is 10.636 with standard deviation (1.94) and the obtained 't' value is 0.22 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.159 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NG-12	25	7.816	4.35	1.152	0.23	48	2.02	*Insignificant*
	DDG-12	25	8.972	2.13					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Girls of 12 years is 7.816 with standard deviation (4.35) and Deaf-dumb Girls is 8.972 with standard deviation (2.13) and the obtained 't' value is 0.23 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.160 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NG-13	25	10.492	3.71	1.036	0.35	48	2.02	*Insignificant*
	DDG-13	25	9.456	4.18					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Girls of 13 years is 10.492 with standard deviation (3.71) and Deaf-dumb Girls is 9.456 with standard deviation (4.18) and the obtained 't' value is 0.35 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.161 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the CALF SKINFOLD

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF SKINFOLD	NG-14	25	10.9	3.56	0.492	0.61	48	2.02	*Insignificant*
	DDG-14	25	10.408	3.21					

* Significance at .05 Levels

The above table shows that the mean value of Calf Skinfold of Normal Girls of 14 years is 10.9 with standard deviation (3.56) and Deaf-dumb Girls is 10.408 with standard deviation (3.21) and the obtained 't' value is 0.61 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.162 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NG-08	25	4.42	0.27	0.22	0.02	48	2.02	*Insignificant*
	DDG-08	25	4.64	0.39					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Girls of 08 years is 4.42 with standard deviation (0.27) and Deaf-dumb Girls is 4.64 with standard deviation (0.39) and the obtained 't' value is 0.02 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.163 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NG-09	25	4.808	0.41	0.288	0.003	48	2.02	*Insignificant*
	DDG-09	25	4.52	0.23					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Girls of 09 years is 4.808 with standard deviation (0.41) and Deaf-dumb Girls is 4.52 with standard deviation (0.23) and the obtained 't' value is 0.003 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.164 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NG-10	25	4.776	0.266	0.208	0.005	48	2.02	*Insignificant*
	DDG-10	25	4.568	0.24					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Girls of 10 years is 4.776 with standard deviation (0.266) and Deaf-dumb Girls is 4.568 with standard deviation (0.24) and the obtained 't' value is 0.005 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.165 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NG-11	25	5.16	0.241	0.208	0.001	48	2.02	*Insignificant*
	DDG-11	25	4.952	0.20					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Girls of 11 years is 5.16 with standard deviation (0.241) and Deaf-dumb Girls is 4.952 with standard deviation (0.20) and the obtained 't' value is 0.001 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.166 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NG-12	25	5.384	0.23	0.404	0.162	48	2.02	*Insignificant*
	DDG-12	25	4.98	0.281					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Girls of 12 years is 5.384 with standard deviation (0.23) and Deaf-dumb Girls is 4.98 with standard deviation (0.281) and the obtained 't' value is 0.162 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.167 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NG-13	25	5.408	0.29	0.300	0.001	48	2.02	*Insignificant*
	DDG-13	25	5.108	0.23					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Girls of 13 years is 5.408 with standard deviation (0.29) and Deaf-dumb Girls is 5.108 with standard deviation (0.23) and the obtained 't' value is 0.001 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.168 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the HUMERUS BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
HUMERUS BREADTH	NG-14	25	5.484	0.31	0.060	0.881	48	2.02	*Insignificant*
	DDG-14	25	5.544	1.98					

* Significance at .05 Levels

The above table shows that the mean value of Humerus Skinfold of Normal Girls of 14 years is 5.484 with standard deviation (0.31) and Deaf-dumb Girls is 5.544 with standard deviation (1.98) and the obtained 't' value is 0.881 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.169 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NG-08	25	6.456	0.30	0.532	0.156	48	2.02	*Insignificant*
	DDG-08	25	6.988	0.45					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Girls of 08 years is 6.456 with standard deviation (0.30) and Deaf-dumb Girls is 6.988 with standard deviation (0.45) and the obtained 't' value is 0.156 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.170 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NG-09	25	6.676	0.28	0.044	0.62	48	2.02	*Insignificant*
	DDG-09	25	6.72	0.34					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Girls of 09 years is 6.676 with standard deviation (0.28) and Deaf-dumb Girls is 6.72 with standard deviation (0.34) and the obtained 't' value is 0.62 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.171 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NG-10	25	6.536	0.32	0.348	0.051	48	2.02	*Insignificant*
	DDG-10	25	6.884	0.22					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Girls of 10 years is 6.536 with standard deviation (0.32) and Deaf-dumb Girls is 6.884 with standard deviation (0.22) and the obtained 't' value is 0.051 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.172 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NG-11	25	6.956	0.377	0.392	0.001	48	2.02	*Insignificant*
	DDG-11	25	7.348	0.462					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Girls of 11 years is 6.956 with standard deviation (0.377) and Deaf-dumb Girls is 7.348 with standard deviation (0.462) and the obtained 't' value is 0.001 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.173 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NG-12	25	6.996	0.551	0.576	0.45	48	2.02	*Insignificant*
	DDG-12	25	7.572	0.328					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Girls of 12 years is 6.996 with standard deviation (0.551) and Deaf-dumb Girls is 7.572 with standard deviation (0.328) and the obtained 't' value is 0.45 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.174 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NG-13	25	7.264	0.622	0.072	0.62	48	2.02	*Insignificant*
	DDG-13	25	7.336	0.381					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Girls of 13 years is 7.264 with standard deviation (0.622) and Deaf-dumb Girls is 7.336 with standard deviation (0.381) and the obtained 't' value is 0.62 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.175 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the FEMUR BREADTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
FEMUR BREADTH	NG-14	25	7.152	0.575	0.336	0.008	48	2.02	*Insignificant*
	DDG-14	25	7.488	0.20					

* Significance at .05 Levels

The above table shows that the mean value of Femur Skinfold of Normal Girls of 14 years is 7.512 with standard deviation (0.575) and Deaf-dumb Girls is 7.488 with standard deviation (0.20) and the obtained 't' value is 0.008 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.176 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NG-08	25	14.88	1.05	0.52	0.10	48	2.02	*Insignificant*
	DDG-08	25	15.4	1.15					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Girls of 08 years is 14.88 with standard deviation (1.05) and Deaf-dumb Girls is 15.4 with standard deviation (1.15) and the obtained 't' value is 0.10 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.177 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NG-09	25	15.08	1.46	0.32	0.33	48	2.02	*Insignificant*
	DDG-09	25	15.4	0.763					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Girls of 09 years is 15.08 with standard deviation (1.46) and Deaf-dumb Girls is 15.40 with standard deviation (0.763) and the obtained 't' value is 0.33 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.178 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NG-10	25	15	1.38	0.40	0.21	48	2.02	*Insignificant*
	DDG-10	25	15.4	0.81					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Girls of 10 years is 15 with standard deviation (1.38) and Deaf-dumb Girls is 15.40 with standard deviation (0.81) and the obtained 't' value is 0.21 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.179 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NG-11	25	16.36	1.28	0.36	0.28	48	2.02	*Insignificant*
	DDG-11	25	16.72	1.06					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Girls of 11 years is 16.36 with standard deviation (1.28) and Deaf-dumb Girls is 16.72 with standard deviation (1.06) and the obtained 't' value is 0.28 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.180 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NG-12	25	16.8	1.70	0.16	0.68	48	2.02	*Insignificant*
	DDG-12	25	16.96	0.93					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Girls of 12 years is 16.80 with standard deviation (1.70) and Deaf-dumb Girls is 16.96 with standard deviation (0.93) and the obtained 't' value is 0.68 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.181 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NG-13	25	18	1.91	1.12	0.01	48	2.02	*Insignificant*
	DDG-13	25	16.88	1.30					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Girls of 13 years is 18 with standard deviation (1.91) and Deaf-dumb Girls is 16.88 with standard deviation (1.30) 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 4.182 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the BICEPS MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
BICEPS MUSCLE GIRTH	NG-14	25	18	1.65	0.36	0.36	48	2.02	*Insignificant*
	DDG-14	25	17.64	1.07					

* Significance at .05 Levels

The above table shows that the mean value of Biceps Muscle Girth of Normal Girls of 14 years is 18 with standard deviation (1.65) and Deaf-dumb Girls is 17.64 with standard deviation (1.07) and the obtained 't' value is 0.36 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

*Table 4.183 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 08 years** for the CALF MUSCLE GIRTH*

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NG-08	25	20.36	1.75	0.52	0.03	48	2.02	*Insignificant*
	DDG-08	25	21.88	1.73					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Girls of 08 years is 20.36 with standard deviation (1.75) and Deaf-dumb Girls is 21.88 with standard deviation (1.73) and the obtained 't' value is 0.03 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.184 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 09 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NG-09	25	20.88	1.69	0.28	0.50	48	2.02	*Insignificant*
	DDG-09	25	21.16	1.21					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Girls of 09 years is 20.88 with standard deviation (1.69) and Deaf-dumb Girls is 21.16 with standard deviation (1.21) and the obtained 't' value is 0.28 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.185 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 10 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NG-10	25	20.96	1.42	0.60	0.15	48	2.02	*Insignificant*
	DDG-10	25	21.56	1.47					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Girls of 10 years is 20.96 with standard deviation (1.42) and Deaf-dumb Girls is 21.56 with standard deviation (1.47) and the obtained 't' value is 0.15 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.186 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 11 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NG-11	25	23.76	2.16	0.04	0.94	48	2.02	*Insignificant*
	DDG-11	25	23.72	1.67					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Girls of 11 years is 23.76 with standard deviation (2.16) and Deaf-dumb Girls is 23.72 with standard deviation (1.67) 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

Table 4.187 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 12 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NG-12	25	22.96	2.24	1.20	0.026	48	2.02	*Insignificant*
	DDG-12	25	24.16	1.34					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Girls of 12 years is 22.96 with standard deviation (2.24) and Deaf-dumb Girls is 24.16 with standard deviation (1.34) and the obtained 't' value is 0.026 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.188 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 13 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NG-13	25	22.48	2.23	1.92	0.001	48	2.02	*Insignificant*
	DDG-13	25	24.4	1.68					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Girls of 13 years is 22.48 with standard deviation (2.23) and Deaf-dumb Girls is 24.4 with standard deviation (1.68) and the obtained 't' value is 0.001 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

Table 4.189 Showing the comparison of the mean scores and 't' value of the **Normal Girls and Deaf-dumb Girls 14 years** for the CALF MUSCLE GIRTH

Variables	Groups	N	Mean	Standard Deviation	Mean Difference	Obtained Value 't'	Df	Table Value of 't'	Comments
CALF MUSCLE GIRTH	NG-14	25	23.6	2.14	1.12	0.04	48	2.02	*Insignificant*
	DDG-14	25	24.72	1.56					

* Significance at .05 Levels

The above table shows that the mean value of Calf Muscle Girth of Normal Girls of 14 years is 23.6 with standard deviation (2.14) and Deaf-dumb Girls is 24.72 with standard deviation (1.56) and the obtained 't' value is 0.04 at 48 degree of freedom with the table 't' value is 2.02 at .05 level of significance found to be insignificant

IV.2: DISCUSSION:

The changes in body composition from the ages of 08 to 14 years reveals that, although children of this age range do no change as rapidly as children from birth to 6 years of age, there is invariably a regular improvement, with the body compositions curves usually assuming a rough linear relationship to age. A variety of complex changes are observed during pre-pubertal and pubertal within this age range. At the same time, their needs for nutrients may remain high and thus their basic developments in body structure changes as a result of pre-pubertal and pubertal age. A number of structural changes are evidenced during these years.

A gradual increase in height and weight is observed in both boys and girls (normal and deaf-dumb) form 10^{th} year to 12^{th} year. The height and weight spurt of boys is found in the 14^{th} year. The proportionate growth in weight with respect to height is observed in both sexes and variables. The difference of developmental changes in height and weight growth when compared between normal boys with deaf-dumb boys is found insignificant when tested for significance by 't' tests at .05 levels.

Similar changes are observed according to the age in various skin fold measurements viz. triceps, chest, abdomen, suprailliac, subscapularies, thigh and calf also in humerus and knee diameter and biceps and calf girth. No particular difference

is observed within the normal and deaf-dumb boys and girls which carries significance. Hence it is proved from the above statistical analysis that there is no significant difference in body composition profiles are observed among normal and deaf-dumb children between 8 to 14 years

CHAPTER – V

V.1 – SUMMARY:

Present study is an inspiration to do something for the physically challenged. The rationale behind the formation of hypothesis is that the blind have the capability of good listening and reproducing sharp alteration in either vocal or music in the similar way a deaf-dumb without any other physical ailment can do better in sports with specific body composition. It is always noticed that the physically challenged society have feeling of inferiority out of which an insecurity builds in their minds. To overcome the inferiority they dream high and try to adopt remarkable feats. The confidence level grows as society starts recognizing and appreciating it.

The need of these children is proper guidance, nurturing and exposure of optimum things at right time and age and the affection, understanding about their feelings. To excel in sports one is expected to have all the innate physical, physiological, psychological, sociological qualities not in normal, but in higher qualities. The idea of considering deaf-dumb subjects is that they possess all the qualities required to excel in sports except capability of listening which is of least importance for some specific sports.

Growth and development in any creature on earth is inevitable and is a lifelong process. In this study specific qualities in growth are considered which are pre-pubertal, pubertal and partly post-pubertal, where the physiological and psychological changes are observed tremendously. The comparison is made to show that the so called physically challenged (deaf-dumb) children are no way inferior to their normal counterpart. The special quality of attention and concentration can be used positively for enhancing sports performance.

The subjects were randomly selected from various schools. The body composition profiles of the normal and deaf-dumb children between 8 to 14 years were compared. The raw scores were then statistically analyzed and compared for interpretation. It was noticed that there is no significant difference in normal and deaf-dumb (boys).

Few physical developments are observed as under which may be helpful in sports and physical activities:

Few similar studies were conducted at various geographical areas. Few difficulties on ground and with management of schools were faced by the researcher during the study. Based on the result of this study, a training methodology can be established for normal as well as deaf-dumb. The results of the study can be implemented for the alterations of psychological mind set like pessimism, inferiority, reactionary of deaf-dumb towards facing the complexities, reconstructing pessimism and developing confidence. The details of the purpose, objectives, significance, hypothesis, limitation, delimitations, required definitions, methodology, analysis, interpretation, conclusion, recommendations and suggestions are detailed logically.

In this research several facets of the body composition of children from 08 to 14 years are covered. Problems and procedures of testing are discussed. The inter-relationships between body composition profiles are explored, including a review of the findings of some factorial studies carried out within recent years. The manner in which body composition improve as children grow older is surveyed, including comparisons of the body composition profiles within normal and deaf-dumb children between 8 to 14 years.

V.2 - CONCLUSION:

The study of the scores elicited in tasks through which the body composition of children between the ages 08 and 14 years have been assessed led to the following generalization:

Various body composition such as height, sitting height, weight, scapula skinfold, triceps skinfold, chest skinfold, abdomen skinfold, suprailliac skinfold, thigh skinfold, calf skinfold, humerus diameter, femur diameter, biceps girth and calf girth are measured among normal and deaf-dumb children between 8 to 14 years and found all the comparisons with no significant difference in the selected samples. Similar studies were also reviewed and quoted in respect and in relation to body composition and development of motor developments among these children.

Physical maturation factor generalised:

- Pressure stress on the growth plates will stimulate bone growth in thickness and thus enhance sturdy skeletal development (Malina, 1948b)
- However, putting excess pressure or traction on a growing bone, especially on the growth plate, may cause bone growth deformation (Haywood, 1993)
- Children aged 10-12 years should be developing their muscular endurance.
- During the first part of the stage, training should be more general and varied, whereas in the latter part of it, training should become more specific and focused on different areas of the body (Fortmann, 1993)
- Note that local muscular endurance training should not be totally ignored during childhood, particularly in the reinforcement of muscular weaknesses, and in the maintenance of posture (Portmann, 1993)
- Girls begin their adolescent growth spurt when they are about 9 years old (plus or minus a year) which lasts for 2 to 3 years (Dworetzky, 1990; Portmann, 1993)
- In growth spurts, the bones grow faster than the muscle, tendons, and ligaments around them, thus making the sportsmen tighter and more susceptible to tissure strains and pulls (Caine and Lindner, 1985)
- Training appears not to accelerate or decelerate skeletal maturation(Cerney, 1970; Kotulan, Reznickova, and Placheta, 1980; Novotny, 1981)
- The growth of the brain size is very slow.
- The size of the skull remains nearly the same until approximately the end of the stage (10 years of age), where the head broadens and lengthens (Gallahue, 1987)
- The body begins to lengthen out.
- It gains 5.1 to 7.6 centimeters (2 to 3 inches) and 1.4 to 2.7 kilograms (3 to 6 pounds) annually (Gallahue, 1987)
- Larger muscle groups are more developed than smaller ones.
- Children aged 6-9 years prefer activities involving the whole body (Gallahue, 1987; Tihanyi, 1982)

- The Schema of the body reaches maturity at 11-12 years of age, which means those both gross motor control and fine motor control and practically fully established (Rigal, poletti, and Portmann, 1981).
- Therefore, children are perfecting an increasing number of motor skills (Haywood, 1993)
- Between 10-14 years of age, adolescents experience another increase in speed and they can integrate the factors that determine it (Portmann, 1993)
- On average, a girl's muscle mass increases until the age of 13 (Malina, 1978)
- As muscle growth increases, there is a corresponding increase in strength (Dworetzky, 1990)
- Main increase in strength occurs during a few months following or even just before PHV (Bar-Or, 1988)
- The cardio-respiratory system continues its development.
- A six-year-old will on average, have a heartbeat of 105 beats / minute at rest.
- Girls will average 95 beats/ minute
- Under exertion, the heartbeat can reach a value of 210-215 beats/ minute (Portmann, 1993)
- VO_2 max increases until post-puberty (Cunningham, Paterson, Blimkie, and Donner, 1984; Hughson, 1986)
- Highly trained children have an anaerobic threshold value ranging at 75-85% of their VO_2 max (Portmann, 1993)
- Training at lower levels of the anaerobic threshold, which allows aerobic endurance training, does not set any problems for children (Portmann, 1993)
- Pre-pubescent children are not well equipped to withstand lactic acid and thus have a low ability to sustain high intensity sub-maximal exercise (Bar-Or, 1983)
- Because they have proportionally essential muscle mass than adults (30% versus 45%) young children have lower capacity to produce anaerobic energy compared to the same mass of the adult muscle, 9Sharp, 1997, personal communication)

- A child's basal metabolic rate can reach 20 to 30 times that of an adult's.
- As a result, the high level child-athlete needs to intake a substantial amount of proteins on a daily basis, as well as complex carbohydrates for energy metabolism (Portmann, 1993; Sharp, 1997, personal communication)
- Individuals of this age group are slightly more vulnerable to soft tissue and growth plate (Epiphyseal and apophyseal) injuries to increased strength / power in tractioned muscles and repeated loading by rapid bone growth (Caine and Linder, 1985; Hughson, 1986)
- Hard floor surfaces are a cause of shin problems (Sanders, 1990)
- On the average, girls reach their peak high velocity (PHV) at 11.5 to 12.0 years (Haywood, 1993). The velocity is approximately 8 cm/year (Beunen and Malina, 1988)
- Peak weight velocity follows PHV in Girls by 3.5 to 10.5 months
- Sometimes the growth of various segment lengths and breadths, reach peak velocity before the girl reaches PHV, sometime after, but all reach their peak before CR at peak weight velocity (Beunen and Malina, 1988)
- Thus, body parts are growing at different rates and proportions are changing (Dworetzky, 1990; Malina, 1984; Malina and Bouchard, 1991)
- This may give the adolescent a disproportional appearance (Dworetzky, 1990) and results in feelings of awakwardness when performing certain skills (Malina and Bouchars, 1991; Tihanyi, 1982)
- The awakwardness or lag in performance presumably involves problems with agility balance, and coordination (Malina and Bouchard, 1991; Portmann, 1993). Parasitic movements may appear.
- The age at which girls reach PHV is unaffected by training (Mirwald and Bailey, 1986)
- Regardless of the exact chronological age, a girl begins her growth spurt; menarche typically follows the PHV within 11 to 12 months.
- The national average age of menarche for females is 12.5 years (Rogol, 1988)
- The average age of menarche in gymnasts is 15.3 years (Wells and Plowman, 1988)

- Primary amenorrhea may occur after 16 years of age, however, these values may have changed more recently (Leglise, 1996)

  BOYS:
- Between the ages f 11-12 years, significant muscle growth takes place in boys.
- This muscle development is shortly followed by strength gains in boys.
- Approximately 30% of the weight of the average 12 years old boy is made up of muscle tissue (Carron and Bailey, 1974; Tihonyi, 1982)
- Boys increase their strength by about 65% during puberty (Dworetzky, 1990)
- Individuals of this age group are slightly more vulnerable to soft tissue and growth plate (Epiphyseal and apophyseal) injuries due to increased strength/ power in traction muscle, and repated loading by rapid bone growth (Caine and Linaner, 1985; Hughson, 1986)
- Most children experience beginning of growth spurt which will last for 2 to 3 years.
- In growth spurts, the bones grow faster than the muscles, tendons, and ligaments around the, thus making the muscles tighter and more susceptible to tissue strains and pulls (Caine and Lindner, 1985)
- Early physical maturation among boys can enhance athletic ability which often leads to increased status among peers, members of the opposite sex and adults (Siegel, 1982)
- On the other hand, late male matures sometimes fear that they may never develop further or grow taller (Siegel, 1982)
- Children who grow slowly actually grow over a longer period of time, therefore usually end up to be taller than early maturing children (Malina and Bouchard, 1991)
- Fusion of growth plates occurs earlier in early matures.
- Conversely late matures have open growth plates for a longer time and thus are at risk to growth plate injuries for a longer time.
- Between 11-13 years of age, the anaerobic lactic system improves considerably, although it is still far from being close to that of an adult’s

- During the early pubertal stage, it is still important not to involve young adolescents in training situations that provoke high levels of lactic acid (maximal repetitive loads) for reasons that have been mentioned in previous stages (Portmann, 1993)
- The aerobic endurance capacity of the athlete continues to improve gradually during this stage (Hughson, 1986) partly due to increased haemoglobin (Dworetzky, 1990)
- There is a reduction in joint flexibility during rapid growth since muscle tissue lengthens in response to increases in bone length.
- This may contribute to conditions favourable to overuse injury (Caine and Lindener, 1985)

- During this stage, PHV peak height velocity (PHV) will be achieved.
- The growth in height tapers off at approximately at age of 14 with notable increases in height ending around age 16 (Beunen and Malina, 1988)
- All boys will achieve PHV during this maturation period regardless of their chronological age.
- The year before, during and the year after PHV, linear growth is rapid (Malina and Bouchard,1991;Tihanyi, 1982)
- The end of this stage is characterized by the optimal time for muscle hypertrophy (Carron and Bailey, 1974; Haywood 1993)
- Over 70% of boys reach peak strength development velocity between 0.5-1.5 years after PHV (Malina and Bouchard, 1991)
- During puberty, the capacity for strength, increases rapidly with a male's sexual maturation (Portmann, 1993)
- Early maturing boys are stronger at all ages than normal or slow maturing boys (Malina and Bouchard, 1991)
- Early maturing boys may reach PHV before or by the age of 13 years and therefore experience acceleration in strength by about 14 years of age (within one year)
- By contrast, slow maturing boys will have an age delayed PHV well past 15 years of age.

- For these boys strength acceleration will also be delayed beyond 16 years of age.
- Peak velocity for leg length occurs earlier than PHV (approximately 60% of height increases). Whereas peak velocity for sitting height or trunk length, skeleton breadths and circumferences of the trunk, and upper extremities occurs after that for stature.
- Therefore, there is rapid growth of the lower extremities in the early part of the adolescent spurt (Malina and Bouchars, 1991)
- In the arm muscle, peak velocity occurs about 3 to 4 months after PHV
- Peak gain the muscle tissue of the calf occurs at PHV
- Gains in fat tissue on the arm begin to decline about 1 year before PHV reach their lowest point coincident with PHV, and then rise systematically after PHV
- Fat on the calf begins to decrease during the year before PHV, and the loss (negative velocity) continues for about 6 months after PHV.
- The velocities for fat lead to remain negative for almost 3 years after PHV (Malina and Bouchard, 1991)
- The adolescent weight spurt includes principally gains in stature (skeletal tissue) and muscle mass
- Fat mass is relatively stable at this time.
- Early- maturing children tend to have greater average body weights and greater weight for stature than average and late maturing children, and tend therefore to be more mesomorphic
- Late maturing boys tend to have relatively narrow hips and relatively broad shoulders, tend to be longer – legged, have a more linear physique and are more ectomorphically inclined (Caine and Lindner, 1985; Malina and Bouchard, 1991)
- During the growth spurt period, damage can occur at the apophysis, where the muscle insertion pulls off fragments of the bone (Cane and Lindner, 1985; Haywood 1993; Hjghson, 1986)
- The articulation surfaces of the wrist bones (carpal bones) are still shaping and fragile
- Following the growth spurt, growth continues slowly

- As a result, the awkwardness which some researchers have reported that was characteristic during early adolescence gradually corrects itself.
- The cardio-respiratory system approaches, and in some cases reaches, maturity (respiratory volume, vital capacity, maximum breathing capacity and aerobic capacity are increased) (Tinanyi, 1992)
- The adolescent spurt in VO2 max begins, on the average, at about 13 years of age and reaches a peak at about 14 years of age (Malina and Bouchard, 1991)
- The anaerobic lactic system is rapidly developing following the male's sexual maturation. It is during puberty that anaerobic training begins to be most effective, although production of energy through the aerobic system is still more favorable (Portmann, 1993)
- An individual flexibility decreases without training even during childhood and adolescence (Haywood, 1993)

Girls:

- During this stage, PHV will be achieved
- The growth in height tapers off at approximately age 14, with notable increases in height ending around age 16 (Beunen and Malina 1988)
- All girls will achieve PHV during this maturation period regardless of their chronological age.
- The year before, during and the year after PHV, linear growth is rapid (Malina and Bouchard, 1991; Tihanyai, 1982)
- Main increase in strength occurs during a few months following or even just before PHV (Bar-Or, 1988)
- Between 12 and 15 years of age, muscle strength only reaches 60% of the adult strength (Portmann, 1993)
- The other extreme concerning diet in this age group is the danger of anorexia nervous and other related diseases (Cook 1984)
- Menstrual periods or the lack of menses causes problems for the adolescent girls.

- During the growth spurt period, damage can occur at the Apophysis – muscle insertion pulls off fragments of the bone (Caine and Linder, 1985; Haywood, 1993; Hughson, 1986)
- The articulation surfaces of the wrist bones (carpal bones) are still shaping and are fragile.
- Following the growth spurt, growth continues slowly.
- As a result, the awkwardness which some researchers have reported, that was characteristic during early adolescence gradually corrects itself.
- The cardio-respiratory system approaches, and in some cases reaches, maturity (respiratory volume, vital capacity, maximum breathing capacity and aerobic capacity are increased) (Tihanyi, 1982)
- VO2 max appears to reach a ceiling at about 14 years of age, showing little or no increase after this point (Bar-Or, 1983)
- The anaerobic lactic system is rapidly developing. It is during puberty that anaerobic training begins to be most effective, although production of energy through the aerobic system is still more favourable (Portmann 1993)
- An individual's flexibility decreases without training, even during childhood and adolescence (Haywood, 1993)
- Moreover, there is a greater loss of flexibility during growth spurt as a result of increased muscle – tendon tightness around the joints (Caine and Linder, 1985)
- This decreased flexibility causes most of the spinal problems in adolescence (Sanders, 1990)

V.3 - SUGGESTIONS:

The following suggestions are projected in the light of body composition profiles which may be useful in the development of sports activities within normal and deaf-dumb children between 8 to 14 years:

1. Increased emphasis should be placed as research that attempts to delineate just what components of which program change what kinds of children in what ways. Incorporation of the motor development exercises will definitely enhance the mental ability controlled by emotionality. E.g. it has been suggested that failure to

fixate on the printed page may stem from emotional stress. Thus, balance-beam walking or trampoline jumping (‘motor stresses’) while watching a point on a wall may habituate the child to fixate under stress, an improvement that may, in turn, positively transfer to the classroom.

2. The effects of motor activities leading to learning within populations of boys and girls should also be studied.
3. The intellectual functions of children with various levels of arousal, using divergent learning strategies and different IQ groups, should be studies as a function of various kinds of perceptual-motor training.
4. A well-designed testing program, accompanied by a comprehensive program to cover a wide variety of problems, is likely to elicit positive changes in children. However, changes are more likely if the children are relatively young and if their problems are not great. Changes are also more likely in measures of fitness and the like than in motor control.
5. Further it cannot be assumed that changes in test scores constitute some kind of subtle rearrangement; improvement may be due to the child’s discovering and employing more efficient strategies when executing a skill. More and more literature is appearing suggesting further research, organizing helpful remedial techniques and evaluation programs and offering other general and specific background information to those contemplating a program for children whose movement abilities are less than adequate.
6. Consideration of the samples from cities may establish: (1) Fit children should be afforded frequent and vigorous opportunities during the school day to exercise their movement capacities and thus enable them to bring full attention and intellectual energy to academic work. (2) So called academic work, for some children, should be integrated with movement activities.
7. Numerous measurement problems have plagued scholar attempting to evaluate the motor abilities of children. Young children are extremely variable in the manner in which they decide to perform given skills, as they often have not developed efficient work methods. Thus a researcher may construct what he or she believes to be a consistent testing instrument and then find that the performance of children exposed to this testing instrument is extremely unreliable. The scores collected one day from a given group of children may be dissimilar to the scores collected on a second day on the same tests by the same children.

8. The problem of locating valid norms is also difficult groups of children of the same age tested by two different researchers in the same event, such as standing broad jump, will often obtain highly dissimilar average scores. At the same time, some of the work that has been done fails delineates testing procedures exactly. It is well known that if either instructions or conditions are varied slightly, children will often modify their performances to marked degrees. It is sometimes not clearly specified whether the children on whom the norms were based were tested individually or in groups.
9. It is suggested that the potentially strong children in motor abilities should be encouraged to participate in specific sports accordingly.
10. Few motor abilities development and activity oriented programs will enhance the supply of oxygen to the brain resulting in the increase in number of brain cells allowing the student to concentrate and enhance in schooling activity.
11. In the near future research in motor development will begin to focus even more on early perceptual as well as cognitive and emotional factors that will be predictive of superior motor performance later in life. Batteries composed of tests of physiological makeup, as well as of perceptual and visual activities, together with measures of muscular strength and motor accuracy, may be useful in this context. Additional factors could also be assessed, such as those evaluating various anthropometric parameters as well as surveys of parental attitudes about sport.
12. One of the more pressing needs is to better understand several aspects of motor learning in infants, children and youth. Despite numerous assertions attesting to the manner in which various skills may be taught to children, it remains unclear just how much may be formally taught to a child, and how much he or she acquires through imitative process. Various individual differences in learning strategies- differences that may vary from age to age and from sex to sex – have not been thoroughly looked at by scholars. Knowledge of this kind when translated into practical terms should help provide more meaningful services not only to the average child, but to children who may be either awkward or motorically ‘gifted’.
13. On reviewing the research literature dealing with the various aspects of the motor development of children, one cannot help and notice that a great many more people are anxious to write about children’s motor development. After reviewing the material that follows, some readers may be encouraged to formulate and carry

out their own investigations into this interesting area of inquiry by confirming or rejecting the speculations through the collection of ‘hard’ data.

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APPENDIX-I

"A Comparative Study of Body Composition Profiles among Normal and Deaf-Dumb Children between 8 to 14 Years"

FULL NAME:
NAME AND ADDRESS OF THE SCHOOL:
DATE OF BIRTH AND AGE:
MALE ( ); FEMALE ( ).
DEAF AND DUMB/ DIFFERENTLY ABLE ( ); NORMAL ( ).
VEGETARIAN ( ); MIX ( ).
SPORTSMAN ( ); NON-SPORTSMAN ( ).
PHYSICALLY MATURED ( ); PHYSICALLY IMMATURED ( ).
HEIGHT:
SITTING HEIGHT:
WEIGHT:
SCAPULA SKIN FOLD (1):
CHEST SKIN FOLD (1):
TRICEPS SKIN FOLD (1):
ABDOMEN SKIN FOLD(1):
SUPRAILLIAC SKIN FOLD (1):
THIGH SKIN FOLD (1):
CALF SKIN FOLD(1):
HUMERUS BONE DIAMETER(1):
FEMUR BONE DIAMETER (1):
BICEPS MUSCLE GIRTH(1):
CALF MUSCLE GIRTH(1):
_____ (**Dr. Shatrunjay M. Kote)** Principal Investigator _____ **(Principal/ Headmaster)** Signature and Stamp