

CHAPTER - I

INTRODUCTION

Physical Activity is an integral aspect of human life. Our daily life is sustained and enriched when we are physically active and adopt active healthful life styles that will continue throughout the life span. The emphasis on fitness, wellness and health promotion through active living is highly sought now a days.

Physical Activity is for everybody. Exercise is a key factor in maintaining and improving overall health. In 1996, the Surgeon General of the United States reported that "significant health benefits can be obtained with a moderate amount of physical activity, preferably daily." These benefits are even more important in a disability, since people with disabilities have a tendency to live less active lifestyles. Yet, it is just as important for our body to get exercise. Physical activity and exercise programs of all sorts are indoor and outdoor, sports or recreational, solitary or team. It doesn't matter what we choose, so long as we choose to get a moderate amount of physical activity each day.

A regular physical activity programme will improve fitness and give the student confidence to move through space without instructions. It can also develop motor skills needed for daily living and mobility.

1.1. Adapted Physical Education

Adapted Physical Education is an attitude, a way of teaching in both mainstream and segregated environment, that is reflected in the beliefs and practices of teachers who adjust learning experience to meet individual needs and assure optional success in physical and motor functioning. Adapted Physical Education is defined as a comprehensive service delivery system designed to identify and ameliorate problems within the psychomotor domain. Services include assessment, individualized educational

programming (IEP), developmental or prescriptive teaching, counselling, coordination of related resources / services, and advocacy so as to provide optimal physical education experiences for all children and youth.

A number of different names are also given to the special educational provisions made in the physical education curriculum for those unable to profit from the offerings made to the student body. Among the terms used are corrective, developmental, and Adapted Physical Education. The basic intent of all the programs is the emphasis and approach of the special program. The basic intent of all the programs is the same; the development of total well-being with specific emphasis upon the improvement of posture and general physical condition through motor activity. Corrective Physical Education is a program that emphasizes the change or improvement in function or structure by means of selected exercises. Developmental physical education stresses the development of motor ability and physical fitness in those who are below the desired level. Adapted physical education programs, are those which have the same objectives as the regular physical education program, but in which adjustments are made in the regular offerings to meet the needs and abilities of exceptional students. It should be explained here that adapted has also been widely used as a general term for all the programs directed toward students with deficiencies and disabilities.

1.2. Disability

Disability is a condition or function judged to be significantly impaired relative to the usual standard of an individual or group. The term is used to refer to individual functioning, including physical impairment, sensory impairment, cognitive impairment, intellectual impairment, mental illness, and various types of chronic diseases.

Disability is conceptualized as being a multidimensional experience for the person involved. There may be effects on organs or body parts and there may be effects on a person's participation in areas of life. Correspondingly, three dimensions of disability are recognized : body structure and function (and impairment thereof), activity (and activity restrictions) and participation (and participation restrictions). The classification also

recognizes the role of physical and social environmental factors in affecting disability outcomes.

People with intellectual disabilities are those who develop at a below average rate and experience difficulty in learning and social adjustment. The regulations for the Individuals with Disabilities Education Act (IDEA) provide the following technical definition for intellectual disabilities:

Medical Model of Disability: It is the traditional view that:

- Disability is caused by mental or physical impairment
- The individual is 'impaired' or the individual has a problem
- The focus of the medical profession is to 'cure' or 'alleviate' the effects of impairments
- Disabled people need to be treated, changed, improved and made more 'normal' to fit in with society

1.2.1. Types of Disabilities

- Intellectual Disabilities
- Deafness or Other Hearing Impairment
- Speech or Language Impairment
- Blindness or Other Visual Impairment
- Serious Emotional Impairment
- Orthopaedic Impairment
- Traumatic Brain Injury
- A Learning Disability
- Deaf Blindness or Multiple Disabilities.
- Autism

1.2.1.1. Intellectual Disabilities

Intellectual disability means significantly sub average general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period that adversely affects a child's educational performance.

1.2.1.2. Deafness or Other Hearing Impairment

Hearing impairment or deafness refers to conditions in which individuals are fully or partially unable to detect or perceive atleast some frequencies of sound which can typically be heard by members of their species.

1.2.1.3. Speech or Language Impairment

Speech and language disorders refer to problems in communication and related areas such as oral-motor function--sucking, swallowing, drinking, eating. These delays and disorders range from simple sound substitutions to the inability to understand or use language or use the oral-motor mechanism for functional speech and feeding.

1.2.1.4. Blindness or Other Visual Impairment

Visual impairment (or vision impairment) is vision loss (of a person) to such a degree as to qualify as an additional support need through a significant limitation of visual capability resulting from either disease, trauma, or congenital or degenerative conditions that cannot be corrected by conventional means, such as refractive correction, medication, or surgery.

1.2.1.5. Serious Emotional Impairment

Emotional impairment causes behavioral problems that interfere with any kind of an experience. Behavioral problems associated with emotional impairment are different from those associated with social maladjustment, cognitive and sensory factors, and health issues.

1.2.1.6. Orthopaedic Impairment

Orthopaedic impairment is defined as diseases or disorders that are related to the bones, joints, and/or muscles. Orthopaedic impairment adversely affects a child's educational performance. The term includes impairments caused by congenital anomaly (e.g., clubfoot, absence of some member, etc.), impairments caused by disease (e.g., poliomyelitis, bone tuberculosis, etc.), and impairments from other causes (e.g., cerebral palsy, amputations, and fractures or burns that cause contractures).

1.2.1.7. Traumatic Brain Injury

Traumatic brain injury (TBI, also called intracranial injury) occurs when an external force traumatically injures the brain. TBI can be classified based on severity, mechanism (closed or penetrating head injury), or other features (e.g. occurring in a specific location or over a widespread area). Head injury usually refers to TBI, but is a broader category because it can involve damage to structures other than the brain, such as the scalp and skull.

1.2.1.8. Learning Disability

Learning disability (sometimes called a learning disorder or learning difficulty), is a classification including several disorders in which a person has difficulty learning in a typical manner, usually caused by an unknown factor or factors. The unknown factor is the disorder that affects the brain's ability to receive and process information. This disorder can make it problematic for a person to learn as quickly or in the same way as someone who is not affected by a learning disability. Learning disability is not indicative of intelligence level. Rather, people with a learning disability have trouble performing specific types of skills or completing tasks if left to figure things out by themselves or if taught in conventional ways.

1.2.1.9. Deaf Blindness or Multiple Disabilities

Multiple disabilities with deafness includes deaf blindness, autism, cerebral palsy, and mental retardation. Multiple Disabilities mean concomitant [simultaneous] impairments (such as mental retardation-blindness, mental retardation-orthopedic impairment, etc.), the combination of which causes such severe educational needs that they cannot be accommodated in a special education program solely for one of the impairments.

1.2.1.10. Autism

Autism is a disorder of neural development characterized by impaired social interaction and communication, and by restricted and repetitive behavior. These signs all begin before a child is three years old. Autism affects information processing in the brain by altering how nerve cells and their synapses connect and organize; how this occurs is not well understood.

Autism is known as a 'spectrum disorder,' The severity of this symptom ranges from a mild learning and social disability to a severe impairment, with multiple problems and highly unusual behavior. The disorder may occur alone, or with accompanying problems such as mental retardation or seizures. Autism is not a rare disorder, being the third most common developmental disorder, more common than Down's Syndrome. Typically, about 20 in a population of 10,000 people will be autistic or have autistic symptoms. About 80% of those affected by autism are boys. Autism is found throughout the world, in families of all economic, social, and racial backgrounds. Doctors, politicians, and rickshaw drivers alike all have autistic children.

1.3. Causes of autism

Previously thought to be psycho sociological but recent findings clearly indicate that autism is possibly caused by:

- Brain abnormality, before, during or after birth
- Untreated PKU (Phenyl Ketonuna), Rubella, stomach diseases
- Chemical exposures during pregnancy
- Biochemical imbalances and
- Genetic factors

1.4. Autism and Children

A child with high functioning autism may have a normal or high I.Q., be able to attend a regular school and hold a job later in life. However, this person may have difficulty expressing himself and may not know how to mix with other people. Moderately and more seriously affected children with autism will vary tremendously. Some autistic children do not ever develop speech, while others may develop speech but still have difficulty using language to communicate. Often, there is an unusual speech pattern, such as echoing whatever is said to them, repeating a word over and over, reversing "you" and "I" when asking for something, and speaking only to express needs, rather than emotions.

A child with autism looks just like any other child, but has distinctive behavior patterns. A child who is autistic may enjoy rocking or spinning either himself or other objects, and may be happy to repeat the same activity for a long period of time. At other times, the child may move very quickly from one activity to another, and may appear to be hyperactive. Many autistic children have sensitivity to certain sounds or touch, and at other times, may appear not to hear anything at all. Autistic children may have very limited pretend play; they may not play appropriately with toys or may prefer to play with objects which are not toys. Autistic children may be able to do some thing, like singing songs or recite rhymes very well, but may not be able to do things requiring social skills very well.

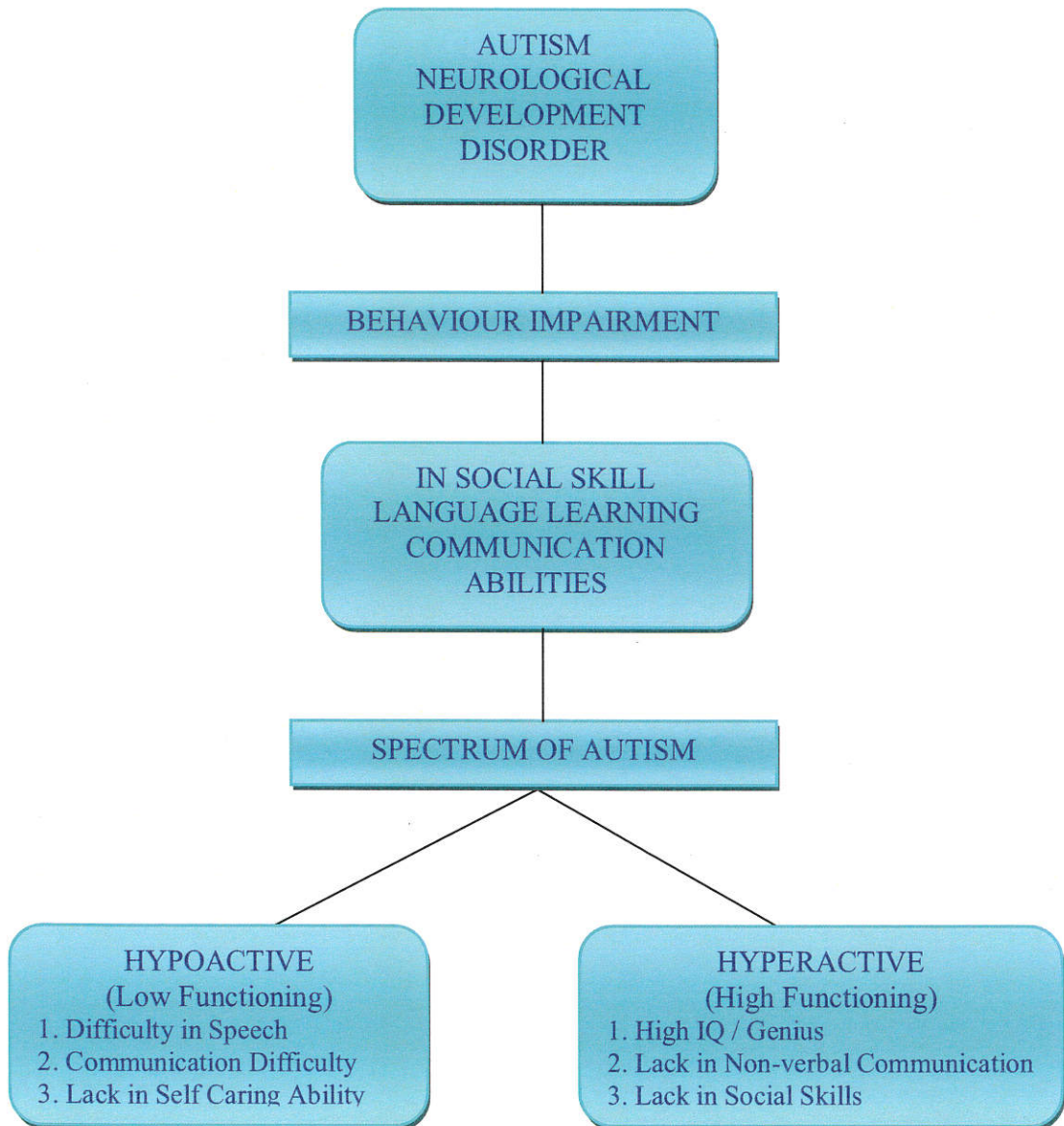


Fig I: Flow Chart Depicting Autism

1.5. Characteristics of Autism

Autism is a neurological development disorder that triggers a series of behavioral maladies such as impairment in social skills, impairment in language learning and communication abilities. Autism affected children normally avoid eye contacts with adults including their parents and would like to retract to solitude. They dislike or are indifferent to affectionate gestures such as touching and hugging. The spectrum of autism is of two kinds namely low functioning and high functioning autism. In a low functioning category, the afflicted person will have difficulty in speech and communication and they also will lack in self-caring abilities. In the case of high functioning autism, the affected person will have high IQ and is regarded as genius some times, but they lack in understanding non-verbal communication and social skills. (www.autism-india.org)

1.6. Other Characteristics (Jayachandran 1999)

- Problem in motor control (tiptoe walking, flapping limbs and odd posture)
- Abnormal response to sensory experience, either indifferent or over-reactive.
- Inappropriate emotional reactions, laughing, crying for no apparent reason.
- Problems in self-help skills, weak concentration, easily distractible
- Prone to convulsions, some of the affected persons.
- Exhibit confusion over which is left hand and which is right hand.
- Have no fear of realistic dangers, heights, fire and so on .

1.7. Hyperactive - Autism

Hyperactivity can have a medical reason. However, most children with Autism are restless because of an impairment of their imaginative and social skills. They cannot play with their toys and other children meaningfully and find it very difficult to occupy themselves. Often they eat a lot to keep themselves occupied. Hyperactivity can be reduced as the children are taught new skills and ways to keep themselves occupied.

1.8. Hypoactive - Autism

Hypoactive (meaning under active) child moves slow, walks slow, has a hard time and to keep them up is a little tough. A child who is under active deals every thing slowly. It takes 10 min to get from the porch to the van. They stop and look at everything and just move very slow. This gets worse at stores or malls. They move so slow like they are drunk. We have four steps leading down from our front door. If we don't help them at all, it takes them at least 5 minutes to get down the steps. He will stop on each step and space out. I usually just pick them up and carry them to the van, or put them in the stroller or cart or whatever. We have very little patience when it comes to them moving slowly.

1.9. Social Development

Social deficits distinguish autism and the related Autism Spectrum Disorders (ASD) from other developmental disorders. People with autism have social impairments and often lack the intuition about others that many people take for granted. Noted autistic Temple Grandin described her inability to understand the social communication of neuro typical, or people with normal neural development, as leaving her feeling like an anthropologist on Mars.

Unusual social development becomes apparent early in childhood. Autistic infants show less attention to social stimuli, smile and look at others less often, and respond less to their own name. Autistic toddlers differ more strikingly from social norms; for example, they have less eye contact and turn taking, and are more likely to communicate by manipulating another person. Three to five years old autistic children are less likely to exhibit social understanding, approach others spontaneously, imitate and respond to emotions, communicate nonverbally, and take turns with others. However, they do form attachments to their primary caregivers. Most autistic children display moderately less attachment security than non-autistic children, although this difference disappears in children with higher mental development or less severe ASD. Older children and adults with ASD perform worse on tests of face and emotion recognition.

Contrary to common beliefs, autistic children do not prefer being alone. Making and maintaining friendship often proves to be difficult for those with autism. For them, the quality of friendship, not the number of friends, predicts how lonely they feel. Functional friendship, such as those resulting in invitations to parties, may affect their quality of life more deeply.

There are many anecdotal reports, but few systematic studies, of aggression and violence in individuals with ASD. The limited data suggest that, in children with mental retardation, autism is associated with aggression, destruction of property, and tantrums. A 2007 study interviewed parents of 67 children with ASD and reported that about two-third of the children had periods of severe tantrums and about one-third had a history of aggression, with tantrums significantly more common than in anon-autistic children with language discharged from hospital with a diagnosis of ASD, those who committed violent crimes were significantly more likely to have other psychopathological conditions such as psychosis.

1.10. Communication

About a third to a half of individuals with autism do not develop enough natural speech to meet their daily communication needs. Differences in communication may be present from the first year of life, and may include delayed onset of babbling, unusual gestures, diminished responsiveness, and vocal patterns that are not synchronized with the caregiver. In the second and third years, autistic children have less frequent and less diverse babbling, consonants, words, and word combinations; their gestures are less often integrated with words. Autistic children are less likely to make requests or share experiences, and are more likely to simply repeat others' words (echolalia) or reverse pronoun. Joint attention seems to be necessary for functional speech, and deficits in joint attention seem to distinguish infants with ASD: for example, they may look at a pointing hand instead of the pointed-at object, and they consistently fail to point at objects in order to comment on or share an experience. Autistic children may have difficulty with imaginative play and with developing symbols into language.

In a pair of studies, high-function autistic children aged 8-15 performed equally well, and adults better than individually matched controls at basic language tasks involving vocabulary and spelling. Both autistic groups performed worse than controls at complex language tasks such as figurative language, comprehension and inference. As people are often sized up initially from their basic language skills, these studies suggest that people speaking to autistic individuals are more likely to overestimate what their audience comprehends.

1.11. Repetitive Behavior

Autistic individuals display many forms of repetitive or restricted behavior. The Repetitive Behavior Scale-Revised (RBS-R) is categorized as follows.

- Stereotype is repetitive movement, such as hand flapping, making sounds, head rolling, or body rocking.
- Compulsive behavior is intended and appears to follow rules, such as arranging objects in stacks or lines.
- Sameness is resistance to change; for example, insisting that the furniture not be moved or refusing to be interrupted.
- Ritualistic behavior involves an unvarying pattern of daily activities such as an unchanging menu or a dressing ritual. This is closely associated with sameness and an independent validation has suggested combining the two factors.
- Restricted behavior is limited in focus, interest, or activity, such as preoccupation with a single television program, toy, or game.
- Self-injury includes movements that injure or can injure the person, such as eye poking, skin picking, hand biting, and head banging

No single repetitive behavior seems to be specific to autism, but only autism appears to have an elevated pattern of occurrence and severity of these behaviors.

1.12. Other Symptoms of Autism

Autistic individuals may have symptoms that are independent of the diagnosis, but that can effect the individual or the family. An estimated 0.5% to 10% of individual with ASD show unusual abilities, ranging from splinter skills such as the memorization of trivia to the extraordinarily rare talents of prodigious autistic savants. Many individuals with ASD show superior skills in perception and attention, relative to the general population. Sensory abnormalities are found in over 90% of those with autism, and are considered core features by some, although there is no good evidence that sensory symptoms differentiate autism from other development disorders. Differences are greater for under-responsivity (for example, walking into things) than for over-responsivity (for example, distress from loud noises) or for sensation seeking (for example, rhythmic movements). An estimated 60%- 80% of autistic people have motor signs that include poor muscle tone, poor motor planning, and toe walking ASD is not associated with severe motor disturbances.

Unusual eating behavior occurs in about three-quarters of children with ASD, to the extent that it was formerly a diagnostic indicator. Selectivity is the most common problem, although eating rituals and food refusal also occur: this does not appear to result in malnutrition. Although some children with autism also have gastrointestinal (GI) symptoms, there is a lack of published rigorous data to support the theory that autistic children have more or different GI symptoms than usual: studies report conflicting results, and the relationship between GI problems and ASD is unclear.

At some point in childhood, about two-thirds of individuals with ASD are affected by sleep problems; these most commonly include symptoms of insomnia such as difficulty in falling asleep, frequent nocturnal awakenings, and early morning awakenings. Sleep problems are associated with difficult behaviors and family stress, and are often a focus of clinical attention over and above the primary ASD diagnosis.

Parents of children with ASD have higher level of stress. Siblings of children with ASD report greater admiration of and less conflict with the affected sibling than

siblings of unaffected children or those with Down syndrome; siblings of individuals with ASD have greater risk of negative well being and poorer sibling relationship as adults.

1.13. Classification of Autism

Autism is one of the five pervasive development disorders (PDD), which are characterized by widespread abnormalities of social interactions and communication, and severely restricted interests and high repetitive behavior. These symptoms do not imply sickness, fragility, or emotional disturbance of the five PDD forms, Asperger syndrome is closest to autism in signs and likely causes; Rett syndrome and childhood disintegrative disorder share several signs with autism, but may have unrelated causes; PDD not otherwise specified (PDD-NOS; also called a typical; autism) is diagnosed when the criteria are not met for a more specific disorder. Unlike with autism, people with Asperger syndrome have no substantial delay in language development. The terminology of autism can be bewildering, with autism, Asperger syndrome and PDD-NOS often called the autism spectrum disorders (ASD) or sometimes the autistic disorders, whereas autism itself is often called autistic disorder, childhood autism or infantile autism. In this article, autism refers to the classic autistic disorder; in clinical practice, though autism, ASD, and PDD are often used interchangeably. ASD, in turn, is a subset of the broader autism phenotype, which describes individuals who may not have ASD but do have autistic-like traits, such as avoiding eye contact.

The manifestations of autism cover a wide spectrum, ranging from individuals with severe impairments—who may be silent, mentally disabled, and locked into hand flapping and rocking—to high functioning individuals who may have active but distinctly odd social approaches, narrowly focused interests, and verbose, pedantic communication, because the behavior spectrum is arbitrary. Sometimes the syndrome is divided into low-medium-or high- functioning autism (LFA, MFA, and HFA), based on IQ thresholds, or on how much support the individual requires in daily life; these subdivisions are not standardized and are controversial. Autism can also be divided into syndromal and nonsyndromal autism; the syndromal autism is associated with severe or profound mental retardation or a congenital syndrome with physical symptoms, such as tuberous sclerosis.

Although individuals with Asperger syndrome tend to perform better cognitively than those with autism, the extent of the overlap between Asperger syndrome, HFA, and non-syndrome autism is unclear.

Some studies have reported diagnoses of autism in children due to a loss of language or social skills, as opposed to a failure to make progress, typically from 15 to 30 months of age. The validity of this distinction remains controversial; it is possible that regressive autism is a specific subtype, or that there is a continuum of behaviors between autism with and without regression.

Research into causes has been hampered by the inability to identify biologically meaningful sub-populations and by the traditional boundaries between the disciplines of psychiatry, psychology, neurology and pediatrics. Newer technologies such as MRI can help identify biologically relevant phenotypes (observable traits) that can be viewed on brain scans, to help further neurogenetic studies of autism. It has been proposed to classify autism using genetics as well as behavior, with the name Type 1 autism denoting rare autism cases that test positive for a mutation in CNTANP2 gene.

1.14. Physical Fitness and Autistic Children

The term intellectual disability covers the same population of individuals whose conditions were diagnosed previously with mental retardation in definition, classification, and systems of support. Example of syndromes and conditions associated with intellectual disability include, but are not limited to, attention deficit/hyperactivity disorder (ADHD), autistic syndrome disorder, Down syndrome, fragile X syndrome, and klinefelter syndrome. Historically, there were limited studies that actually measured the physical activity patterns of youth with intellectual disability. Consequently, physical activity patterns of youth with intellectual disability were linked to or were based on their physical fitness status. It has been consistently reported that youth with intellectual disability have lower levels of cardiovascular fitness and muscular strength as well as high level of adiposity (i.e., body mass index (BMI) in comparison to their peers without intellectual disability. Therefore, it was assumed that youth without intellectual disability

had lower physical activity patterns than youth without intellectual disability. However, to assume a direct relationship between physical fitness (usually cardiovascular fitness) and physical activity in youth is variable and that 80% -90% of the variance in physical fitness is not accounted for by physical activity. Indeed, it has been reported that no difference in physical activity level exists between children with intellectual disability with low fitness when compared with children with high level of fitness in similar school settings(i.e., physical education class and recess). Physical activity and physical fitness (e.g., cardiovascular fitness) should therefore be viewed as independent health indicators. Given that physical activity in and of itself is an important health behavior for all youth, attempts should be made to evaluate physical activity behavior patterns of youth with intellectual disability.

1.15. Autism as a Neuro Developmental Disorder

Autism is defined as neurodevelopmental disorder usually diagnosed in early childhood that is characterized by impairment in reciprocal communication and speech, repetitive behaviors, and social withdrawal. Although both genetic and environmental factors are thought to be involved, none have been reproducibly identified. The metabolic phenotype of an individual reflects the influence of endogenous and exogenous factors on genotype. As such, it provided a window through which the interactive impact of genes and environment may be viewed and relevant susceptibility factors identified. Although abnormal methionine metabolism has been associated with other neurologic disorders, these pathways and related polymorphisms have not been evaluated in autistic children. Plasma levels of metabolites in methionine transmethylation and transsulfuration pathways were measured in 80 autistic and 73 control children. In addition, common polymorphic variants known to modulate these metabolic pathways were evaluated in 360 autistic children and 205 controls. The metabolic results indicated that plasma methionine and the ratio of S-adenosylmethionine (SAM) to S-adenosylhomocysteine (SAH), an indicator of methylation capacity, were significantly decreased in the autistic children relative to age-matched controls. In addition, plasma levels of cysteine, glutathione, and the ratio of reduced to oxidized glutathione, an indication of antioxidant capacity and redox homeostasis, were significantly decreased.

Differences in allele frequency and /or significant gene-gene interactions were found for relevant genes encoding the reduced folate carrier (RFC 80G>A), transcobalamin II (TCN2 776G >c), catechol-O-methyltransferase (COMT 472G>A), methylenetetrahydrofolate reductase (MTHFR 677C > T and 1298A> C), and glutathione- s transferase (GST M1). Thus it was suggested that an increased vulnerability to oxidative stress (endogenous or environmental) may contribute to the development and clinical manifestations of autism. (Jill James et al 2004).

In the light of the above findings autism itself is defined as neurodevelopmental disorder which was due to increased vulnerability to oxidative stress that contributes to the development of autism. Every physical activity provided to the autistic children must contribute to decrease oxidative stress of these children. Several researches have found that yoga asana are comparably better than physical activities in oxidative stress.. (Jill James et al.2004)

There are number of individualized methods to a child's therapeutic needs and delivered in public school special education settings solely needed for educational as well as psychiatric reasons. Practical delivery of service is especially lacking for those thousands of severely emotionally disturbed school children with major Axis I psychiatric disorders. Often conspicuous to parents and teachers are those children with Pervasive Developmental Disorders(PDD) marked by low intelligence, negativism, opposition to learning, avoidance of relationship with teachers and peers. PDD interferes greatly with the children's receptivity to school procedures and grasp of educational opportunities. If available, treatments for such children would best be given early, as a secondary preventive or public health measure. Early help could hypothetically prevent or reduce the severity of such interferences with acquiring fundamental cognitive and educational tools. Assignment to mental health services which allow the child to be educated could optimally be done by the school when children are screened as they enter public educational systems. Most preferable would be methods which can be delivered in the children's own real-life classroom spaces, without disrupting the ecology of the children's lives and schooling.

Thus, the autistic children are to be treated psychologically to improve their intelligent quotient, cognitive abilities, mental health, and behavior. Researches have proved that yoga asanas have contributed significantly for the development of cognitive abilities, mental health and behaviours than physical activities at all age levels. Autism is a developmental disorder that typically appears in the first three years of life. This disorder makes it difficult for children to communicate verbally and non-verbally, to socially interact with others and to relate to the outside world. Many children with autism, however, also exhibit remarkable abilities in the areas of art, music and math. Autism used to be a rare disorder, occurring in about one in 1500 children. Since the late 1980's, however, the autism rate has risen sharply in the U.S. and other countries. CDC's new numbers for the autism rate are one in 100.

For decades, most psychiatrists considered autism to be a psychological disorder. It is now generally acknowledged that autism is caused by biological factors, but there is little agreement over which factors are most important, and exactly how they cause autism. Unlike other disorders, autism is defined not by its cause, but by its symptoms, which may include purposeless, repetitive behaviors such as hand-flapping, rocking or opening and closing doors. Language skills develop slowly or not at all, the meaning of words is often ignored and gestures are used instead of words. Some individuals with autism may exhibit aggressive or self-injurious behavior and resistance to change in routine. Others may seem to lack common sense, throw tantrums for no apparent reason or obsess over an idea, object or person. Children with autism may also experience sensitivities to sights, sounds, touch, odors and flavors, and have strong reactions to them.

Although autism is defined by a certain set of behaviors, children and adults may exhibit many different combinations of these behaviors, to any degree of severity. Two children, both with the same diagnosis, may act very differently and have varying aptitudes.

1.16. Physical Activity

Physical activity is an integral aspect of human life. Our daily lives are sustained and enriched when we are physically active and adopt active healthful life styles that will continue throughout the life span. The emphasis on fitness, wellness and health promotion through active living is highly sought now days.

Physical activity is bodily movement of any type and may include recreational, fitness and sport activities such as jumping rope, playing soccer, lifting weights, as well as daily activities such as walking to the store, taking the stairs or raking the leaves. Similar health benefits to those received during a physical education class are possible during physical activity bouts when the participant is active at an intensity that increases heart rate and produces heavier than normal breathing.

Physical activity in the context of the study includes calisthenic exercise, Suryanamaskar and minor games.

1.16.1. Calisthenics Exercises

Calisthenics are a form of organized exercises consisting of a variety of simple movements performed without weights or equipment that are intended to increase body strength and flexibility using the weight of one's own body for resistance. They are usually conducted in concert with stretches.

Calisthenics or free body exercises are performed with varying degrees of intensity and rhythm, which may or may not be done with light handheld apparatus such as rings and wands. The exercises employ such motions as bending, stretching, twisting, swinging, kicking, and jumping, as well as such specialized movements as push-ups, sit-ups, and chin-ups.

1.16.2. Benefits of Calisthenic Exercises

The Calisthenic exercise is one of the most available means of developing coordination, reaction time and balance. The Calisthenics exercises must be performed in an exact manner and in full range of motion. In most cases, ten or more repetitions are performed for each exercise and repeated in sets of two or three.

Calisthenics promote strength, endurance, flexibility, and coordination and augment the body's general well-being by placing controllable, regular demands upon the cardiovascular system. The exercises can function as physique builders or serve as warm-ups for more-strenuous sports or exertions.

Calisthenic exercises are the all time favourite means of developing physical condition. Exercises serve nicely as a warm up routine for other activities to follow and it generally provides an outlet for the need for something vigorous especially when a particular lesson requires the pupils to observe and listen more than usual.

Calisthenics is performed for the purpose of attaining four recognised objectives. While these are variously conceived and variously stated by specialists in this field they may be, for our present purpose, briefly stated as follows.

1. The development and maintenance of body health.
2. The development and maintenance of good body mechanics.
3. The development and maintenance of body suppleness.
4. The development and maintenance of body control.

1.16.3. Suryanamaskar

Suryanamaskar is a unique system that combines rigorous physical activity with mental exercises and astrological healing. One round of Suryanamaskar is much better than a week of workout at a gym. The Sun or Lord Sun as our scriptures put it, is central to the existence of this universe. Even in Astrology, the Sun is pivotal. Praying to the Lord Sun helps overcome most of the weaknesses that are generated by a bad horoscope.

1.16.4. Benefits of Suryanamaskar

The benefits of Suryanamaskar are enormous. It revitalises the body and mind. Disorders of the eye, nervous system, digestive system and lungs disappear within a month of regular Suryanamaskar. The exercise also helps one attain longevity and casts a healthy glow on the face of the practitioner.

1.16.5. Minor Games

The investigator has chosen minor games which included the basic motor activities. Since the subject under treatment are children, the investigator felt that they may feel stale and bored-up if the same types of exercises were given on all the day of a week. The investigator strongly felt that if the activities are in the form of minor games, they will be happy to participate with the competitive spirit without feeling fatigue.

1.17. Yoga for Autistic Children

The first step in teaching Yoga to a student with autism is to establish a strong bond with the child. To do this, the Yoga teacher will need to enter the world that the child lives in -- to meet the child on his or her own level. Only then will the teacher be able to gain the child's complete confidence. Massage, music, dance, rhymes and stories are some of the different techniques that the teacher can use to connect with the child.

As a student and a teacher gradually develop a foundation of mutual trust and friendship, the Yoga teacher can introduce some of the Yoga poses (asanas) and breathing exercises (pranayama) that will help to bring the child with autism out of his or her shell and into the world of social interaction. After the student becomes familiar with these introductory poses, the Yoga teacher may progressively add more asanas to the routine, as well as deep relaxation. The combination of asanas, pranayama and deep relaxation will strengthen the child's nervous system, increase overall health and facilitate the development of body awareness and concentration. By establishing optimal physiological and psychological integrity, Yoga therapy helps children with autism gain

new motor, communication and social skills. The end result is an overall improvement in their quality of life.

1.18. Human Psychomotor Skills

Human psychomotor skills are organized patterns of muscular activities guided by changing signals from the environment. Driving a car, drilling a tooth, throwing a ball, typing, operating a lathe, and playing a tromboline are behavioral examples. Also called sensory motor and perceptual motor skills, they are studied as special topics in the experimental psychology of human learning and performance. In research concerning Psychomotor skills, particular attention is given to the learning of coordinated activity of the arms, hands, fingers and feet. The role of verbal processes is not emphasized.(Oxendline 1975).

1.19. Rationale for the Selection of the Study

The investigator of the study, a professional teacher in physical education, is working at YMCA College of physical Education, Chennai, India since 1991. Within the campus of this pioneering physical education college, YMCA project special school for differentially abled children is functioning with a social service motive. The investigator is teaching 'Adapted physical Education' as a theory paper for UG and PG courses in the college and has done many service projects for differentially abled children. His observation of a few cases of Autistic children, their activities and behaviour inspired him to take up an interdisciplinary study by which a programme of physical activities and yoga could be designed to benefit them. Besides, the investigator through literature survey understood that such studies on Autistic children in India are rare and the study would help in serving the differentially abled children of this category to the best extent possible.

Further to state that the discussion on the level of physical fitness of autistic children proved that their physical fitness that involved the muscular endurance, namely speed, abdominal strength, shoulder power and cardiovascular endurance are to

be studied in relation to the physical activities imparted to these children. Hence the investigator was enthused to find out the influence of physical activities and yoga on physical fitness , physiological and psychological variables among autistic children.

1.20. Statement of the Problem

The purpose of the study was to find out the Influence of Physical Activities and Yoga on Selected Physical Fitness, Physiological and Psychological Variables Among Autistic Children.

The purpose of the study was also to find out the influence of physical activity and yoga on Autistic Hyper active and Hypoactive group of children separately for the purpose of understanding the difference between them.

1.21. Hypotheses

The investigator of the study formulated the following hypotheses

1. Physical activities and yogic practices would not significantly influence physical fitness variables such as speed, flexibility and arm explosive power among Hypo active Autistic Children.
2. Physical activities and yogic practices would not significantly influence physical fitness variables such as speed, flexibility and arm explosive power among Hyper Active Autistic Children.
3. Physical Activities and Yogic Practices would not significantly influence physiological variables such as Resting Pulse Rate, Exercise Heart Rate, Arterial Blood Pressure and Vital Capacity among Hypo active Autistic Children.
4. Physical Activities and Yogic Practices would not significantly influence physiological variables such as Resting Pulse Rate, Exercise Heart Rate, Arterial Blood Pressure and Vital Capacity among Hyper active Autistic Children.

5. Physical Activities and Yogic Practices would not significantly influence Performance Intelligence as psychosocial variables among Hypo active Autistic Children.
6. Physical Activities and Yogic Practices would not significantly influence Performance Intelligence as a psychological variable among Hyper active Autistic Children.

1.22. Significance of the Study

1. The findings of this study would throw light on the physical fitness, physiological status and psychological level of the autistic children.
2. The results would be helpful to the parents of the autistic children to encourage them to be involved in physical activities and yogic practices for their speedy recovery.
3. The results of the study may be useful for the teachers in Special Education to use physical activities and yogic practices in an effective way to improve the physical fitness components of autistic children.
4. The study would help teachers, parents and others to know the influence of physical exercises and yogic practices on selected physical, physiological and psychological variables of autistic children.
5. The study would make a significant input for future studies to design and develop modules of instruction to autistic children.
6. The study would help the school teachers, parents, administrators, and physical education teachers to make individualized approach on autistic children to be involved in interested physical and yogic exercises.

1.23. Delimitations

This study was delimited in the following aspects.

1. Autistic children studying in YMCA College Special School and Pathway School for special children, Chennai only were selected as subjects for the study.
2. Only fifty male autistic children were selected for the study out of which twenty five were hypo active and twenty five hyper active.
3. The age of the subjects ranged from six to twelve years.

1.24. Limitations

1. Autistic Children selected for the study were divided into two groups of 25 each as Hyper active and Hypo active groups only on the basis of medical report.
2. As the study was conducted on differentially abled children, due to lack of concentration and hyper active behaviour of the subjects, the investigator utilized the entire academic session 2008-2009 for engineering the treatment using the independent variables and conducting the tests to collect data.
3. Factors like heredity, family background and children's regular programme outside the school were not taken into consideration while interpreting the results.
4. The investigator searched through books, journals and research theses available in the YMCA College of Physical Education , Connemara Central Library and Special Schools Library in Chennai only to collect relevant literature besides internet browsing.

1.25. Definition of Terms

Autism

Autism is defined by the Autism Society of America (ASA) as a complex developmental disability that typically appears during the first three years of life and is the result of a neurological disorder that affects the normal functioning of the brain, impacting development in the areas of social interaction and communication skills. Both children and adults with autism typically show difficulties in verbal and non-verbal communication, social interactions, and leisure or play activities. (www.google.co.in).

Hypoactive

Having too little of something such as hypo activity which refers to not being very active. (kildall.apana.org.au)

Hyperactive

Higher than normal level of activity. An organ can be described as hyperactive if it is more active than usual. Behavior can also be hyperactive (www.emedicinehealth.com)

Physical activity

Physical activity in terms of health and fitness are well known ,including reduced risk of major health problems and improvement in cardio respiratory function, muscular strength and endurance, flexibility and reduction of fat (Howley and Franks,1997)

Yoga

Yoga bestows inner strength , sharpens one's intellect, teaches him to control his emotions and brings a rare concentration and efficiency into his actions and work , making one do the right thing in the right way at the right time.

Yoga in the context of the study means selected asanas practiced by the subject.

Physical Fitness

Physical fitness is the ability to carry out daily tasks with alertness and vigor, without undue fatigue, and with ample energy to engage in leisure pursuits and meet emergency situations. (Clark).

Speed

Speed is the capacity of the individual to perform successive movement of the same pattern at a fast rate.(Barrow and McGee, 1973).

Speed is the maximum rate at which a person is able to move his/her body. In physical terms, speed is the distance moved per second. In physical performance terms it refers to the speed of coordinated joint actions and whole-body movement. .(Barrow and McGee, 1973).

Flexibility

Range of movement in a joint or sequence of joints.(Johnson & Nelson 1975)
Flexibility in the context of the study is flexibility of the hip joint.

Explosive Power

The ability to expend energy in one explosive act or in a series of strong, sudden movement as in jumping, projecting some object as far as possible. (Michael kent, 1994).

Resting Heart Rate

The number of heart beats in one minute (bpm) when a person is at complete rest. A person's resting heart rate decreases as they become more fit. (www.topendsports.com)

Exercise Heart Rate

The heart rate which one should attain during exercise in order to maximise cardiovascular benefits. It is pegged at 60-80% of a person's maximum heart rate. (www.myheart.org.sg)

Diastolic Blood Pressure

The minimal blood pressure which occurs during the relaxation phase of the cycle is called the diastolic blood pressure. (Howell and Howell, 1983).

Systolic Blood Pressure

The maximum blood pressure exerted during the contraction of cardiac cycle is called systolic blood pressure. (Howell and Howell 1983).

Vital Capacity

Maximum amount of air forced to be expired after a maximum inspiration. (Shaver1982).

Intelligence

Intelligence is a general capacity of an individual consciously to adjust his thinking to new requirements. It is general mental adaptability to new problems and conditions of life. (Stern).

Intelligence in the context of the study is 'Performance Intelligence' measured for autistic children.