Assessment of Nutritional Status, Stress Level and Quality of Life of Special Children

Salam Laxmi

(12PFD016)

Thesis Submitted to

Avinashilingam Institute for Home Science and Higher Education for Women

Coimbatore – 641043

In Partial Fulfilment of the Requirement for the

Degree of Master of Science in Food Service Management and Dietetics

MARCH, 2014

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Signature of the Head of the Department

31.3.14

Signature of the Supervisor

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INTRODUCTION

INTRODUCTION

"Every human being is the author of his own health or disease."

Buddha

Health is important as our body can be able to function well and increases the chances of a longer life when we are healthy. It is central to the concept of quality of life, also helps in the achievement of personal ambition and motivates people to move on (Park, 2013).

Health is related to the life-style pattern of the people. Ideal health will however, always remains a mirage, because everything in our life is subject to change. It may be described as a potentiality that is the ability of an individual to function better not for the present but also for the future in the face of changing conditions of life (www.preservearticles.com).

According to United Nation convention on the Rights of persons with Disabilities (2013) define disability as those who have long term physical, mental, intellectual and sensory impairments, which, together with various barriers may hinder their full and effective participation in society on an equal basis with others.

The Global Burden of Disease (GBD) uses the term disability to refer to loss of health, where health is conceptualized in terms of functioning capacity in a set of health domains such as mobility, cognition, hearing and vision .Disability can also be define as any restriction or lack of ability to perform in a manner or within the range considered normal for a human being (WHO, 2006).

The disability is the presence of weakness or certain health conditions that hinder the normal growth of a person or his ability to learn. This leads to weakness or inability to accomplish the expected functions or jobs compared to his other colleagues (www.rhas.org.jo, 2010).

Disability is caused by disorders or abnormalities in chromosomes, developmental disorders that affect brain formation, malnutrition of the mother, infections and diseases of the pregnant mother, dry labor and difficult birth during delivery, child malnutrition, accidents and traumas (Kumar *et al.*, 2008).

Hearing disability is caused by hereditary especially the neurosensory type, some medicines, smoking, alcohol, pregnancy complications (hypertension and diabetes), malnutrition or incompatible Rh-factor during pregnancy, lack of oxygen,

trauma or delivery injuries during delivery, meningitis, ear infection, mumps, fever, measles, severe injuries, accidents, after delivery (www.rhas.org.jo, 2010).

Malnutrition is a major cause of disability in India as well as a contributory factor in other ailments that increase susceptibility to disabling conditions (National Human Rights Commission, 2005).

Vitamin A deficiency like blindness, Vitamin B complex deficiency – beriberi (inflammation or degeneration of the nerves, digestive system and heart), pellagra (central nervous system and gastro-intestinal disorders, skin inflammation) and anemia ,Vitamin D deficiency – rickets (soft and deformed bones) , Iodine deficiency – slow growth, learning difficulties, intellectual disabilities and goiter ,Iron deficiency – anemia, which impedes learning and activity, and is a significant cause of maternal mortality ,Calcium deficiency – osteoporosis (fragile bones) are the common micro nutrient deficiencies that affect disability (NSSO, 2002).

Malnutrition cans potentially prone a disabled child to further morbidities thus imposing further suffering to the affected child and his/her family (Neyestani *et al.,* 2010).

Yeo (2001) described that the relationship of chronic poverty with disability and impairment is dependent upon the disabled individual's experience of discrimination from birth (or from time of disablement) which leads to lack of resources, lower expectations, poor health and poor education. In turn, the chronic poverty conditions enhance the risk of illness, injury and impairment, and thus disability.

Thomas (2005) viewed that the poverty is the biggest cause of disability in India because disabled persons are more likely to suffer from malnutrition, live in crowded and unsanitary conditions (increasing risk of infectious disease) have limited access to medical care, be poorly educated, not immunize their children, lack adequate care during pregnancy and birth and have multiple pregnancies.

According to National Sample Survey Organization (2002) the onset of mental disabilities is concentrated in childhood and the 20-30 age-groups, resulting in the lowest average age of onset. In contrast, visual disabilities are more associated with ageing. While hearing disabilities exhibit a more pronounced dual peak, they are also, on average, subject to later average onset. Both locomotors and speech disabilities are more concentrated in younger ages also, with the highest onset in the early years of

life in both cases, and a more noticeable second wave of onset for speech disabilities around age 60.

According to National Dissemination Center for Children with Disability (2000) defines intellectual disability as a term used when a person has certain limitations in mental functioning and in skills such as communicating, taking care of him or herself, and social skills. These limitations will cause a child to learn and develop more slowly than a typical child.

A hearing impairment that is so severe that the child is impaired in processing linguistic information through hearing, with or without amplification, which adversely affects educational performance (Overton, 2001).

Disability in India, Conference Paper highlighted that visual disability or Blindness refers to a person's inability to see either fully or partially. A visually disabled person is known to be suffering from visual impairment. Low Vision or Poor Eye Sight: A person with low vision or poor eyesight is one who continues to have the problem even after going through medically approved corrective measures. This person with poor eyesight is still in a position to continue his tasks with appropriate assisted devices (Chaudhuri, 2006).

Physical handicapped is defined as the loss of or failure to develop a specific bodily function or functions, whether of movement, sensation, coordination, or speech, but excluding mental impairments or disabilities (Collins English Dictionary, 2003).

Hazmi (2003) opined that Mental retardation is a disorder characterized by low scores on tests of mental ability, limited ability in aspects of daily living and significantly below –average social and communication skills.

According to American Association on Mental Retardation, it is defined as "significantly sub average intellectual functioning existing concurrently with related limitations in two or more of the following applicable adaptive skill areas communication, self-care, home living, social skills, community use, self direction, health and safety, functional academics, leisure and work," with such limitations manifested "before age 18" (Bhagya and Ramakrishna, 2013).

Goldenson (2000) stated that Physical disability is the general term applied to a group of disabling symptoms that means the inability to physically move effectively or the severe physical impairment of control over voluntary muscles because of

paralysis, deformity, loss or other impairments as a result from birth defects, disease, genetics or accidents.

According to Noel (2010) there are many types of physical handicaps that people can acquire. Disability such as blindness, deafness or injuries that can lead to paralysis or amputations and some physical handicaps are not always a hindrance to someone's everyday lifestyle.

The most common physical disabilities are cerebral palsy, amputation and spinal cord injury. Deafness and blindness are also considered physical disabilities, though ones physical mobility and movement may or may not be affected, they are considered physical impairments (Goldenson, 2000).

"Any restriction or lack of abilities to perform an activity in the manner or within the range considered normal for human being". It excludes illness /injury of recent origin (morbidity) resulting into temporary loss of ability to see, hear, speak or move (National Sample Survey Organization, 2002).

(Colin *et al.,* 2000) highlighted that hearing impairment is the most frequent sensory deficit in human populations, affecting more than 250 million people in the world. Consequences of hearing impairment include inability to interpret speech sounds, often producing a reduced ability to communicate, delay in language acquisition, economic and educational disadvantage, social isolation and stigmatization.

Srivastava and Khan (2008) expresses that the number of people with disabilities is increasing due to population growth, ageing, emergence of chronic diseases and medical advances that preserve and prolong life, creating overwhelming demands for health and rehabilitation services.

Stress is unavoidable and can occur in all facets of life. At some level, stress can be seen as a natural part of development and of adaptation to a changing environment. Stress that is prolonged and managed poorly can result in negative physical, mental, and cognitive outcomes for children and youth. It results from the tension between an individual's reaction to difficulties or challenges and his or her ability to handle and resolve the stressful situation (Mary, 2010).

Stress is a way that our body responds to the demands made upon us by the environment, our relationships and our perceptions and interpretations of those

demands. Stress can become distress when we are unable to cope or when we believe that we do not have the ability to meet the challenge (Paul, 2007).

Stress can come from an unstructured classroom, unclear or unreasonable expectations, or fear of failure .It can also be occur through a lack of family routines, over-scheduling, prolonged or serious illness, poor nutrition, change in the family situation, financial problems, family strife or abuse, or unclear or unreasonable expectations (Par mar *et al*., 2011).

Symptoms of Stress includes irritability or unusual emotionality or volatility, sleep difficulty or nightmares ,inability to concentrate, drop in grades or other functioning, toileting or eating concerns ,headaches or stomach aches, unexplained fears or increased anxiety (that also can take the form of clinging),drug or alcohol experimentation (National Association of School Psychologists ,2012).

Inadequate dietary intake causes malnutrition associated with poor physical and mental development, especially in children (Rajai, 2001).

The number of children with developmental disabilities (autism, attention deficit hyperactivity disorder, and other developmental delays) has increased, requiring more health and education services. Additional study of the influence of risk-factor shifts, changes in acceptance, and benefits of early services is needed (Pediatrics, 2011).

NEED OF THE STUDY

Adequate nutrition is a fundamental prerequisite for good physical health, motor, cognitive and social development. Malnutrition children can become adult with lower physical and intellectual abilities, lower level of productivity and higher levels of chronic illness and disability .In India malnutrition and poverty is the biggest cause of disability. Disabled children are more likely to suffer from malnutrition due to lack of adequate care during pregnancy and birth even when the children are not taking adequate nutrients. They may be having some form of stress and even the quality of life may be different from normal people.

Hence the study “assessment of nutritional status, stress level and quality of life of special children” was framed and carried out with the following objectives

Primary objectives: To

- assess the socioeconomic status, anthropometric, clinical, dietary pattern and life style pattern of special children.
- analyses the stress level and quality of life of selected subjects.

Secondary objectives: To

- impart nutrition education to the selected subjects.
- provide stress management strategies.

REVIEW OF LITERATURE

II. REVIEW OF LITERATURE

The review of literature pertaining to the research, of **"Assessment of Nutritional Status, Stress Level and Quality of Life of Special Children"** were discussed in the following heads

A. Prevalence of disabled children
B. Nutritional status of the disabled children
C. Causes and Symptoms of disabled children
D. Stress level of parents of disabled children
E. Prevention of disabled children

A. PREVALENCE OF DISABLED CHILDREN

Globally, 93 million children have moderate or severe disability and 10% of the world's population experiences some form of disability or impairment. Children with disabilities are thought to have a substantially greater risk of being victims of violence than are their non-disabled peers (Hughes *et al.,* 2012; WHO Action plan, 2011).

According to Mont (2007) , disability rate in the different countries of the world are 19.4 % in United State ,20 % in Australia and 2.3% in Mexico (2000),18.5%,3.5% and 2.1% in Canada ,Uganda and India respectively (2001) and 13.1% in Zambia (2006).

Over one billion people or 15% of the world's population live with some form of disability, and of these, between 110 and 190 million have significant difficulties in functioning, according to the World Report on Disability. The estimated number of children with disabilities between 0 and 18 years ranged between 93 million and 150 million, depending on the source (WHO, 2011).

According to Disability Discrimination Act (DDA) 7.3% of UK children were reported as disabled and boys were having a higher rate of difficulties with Physical coordination; memory, concentration and learning; communication than girls (Spencer, 2010).

There are over 10 million disabled adults above 16 years in the UK, which includes limiting long standing illnesses. This is equivalent to 24% of the adult population. There were 770,000 disabled children under the age of 16 in the UK. This equates to 1 in 20 children .Rates of disability are highest within deprived and poorer areas and areas with a legacy of heavy industry, especially coal mining (Disability in the United Kingdom, 2011).

Out of 53.9 million school-aged children aged 5 to 17 years in the U.S. civilian non institutionalized population, about 2.8 million (5.2 percent) were reported to have a disability in 2010 (U S Census Bureau, 2010).

In South-east Asia, the prevalence of disability ranges from 1.5 – 21.3% of the total population, depending on definition and severity of disability (Mont, 2007).

According to 2001 and 2002 survey data, Bangladesh had the highest prevalence rates of 5.6% compared with a 1.5% rate in Timor-Leste. Thailand had a prevalence rate of 2.9%, 21.3% in Indonesia for disability in 2007 compared with a rate of 1.6 % in Sri Lanka and Nepal in 2001.

Shabayek (2006) done a study in Alexandria city, to evaluate the nutritional status of children in which a sample of 278 disabled children, 171 were males and107 were females ,aged 6 to 24 years, were participated and found that mental retardation represent the highest proportion of subjects followed by Down's syndrome and autism. Down syndrome groups at all ages are shorter than the other groups, while disabled males are taller than females at all ages.

Srivastava and Khan (2008) opined that the number of people with disabilities is increasing due to population growth, ageing, emergence of chronic diseases and medical advances that preserve and prolong life, creating overwhelming demands for health and rehabilitation services.

Patel *et al.,*(2009) using NSSO 2002 data, observed that loco motor disabilities are the most prevalent type of disabilities affecting of all ages in India. Mental disabilities are the highest in the working age population, whereas visual and hearing disabilities are the highest in the age.

A report from Disability in the United Kingdom (2011) shows that 156,300 people were registered as partially sighted people. Of those people registered as blind with an additional disability, 4% have a mental health condition, 8% have a learning disability, 60% have a physical disability and 27% have a hearing impairment. Of those people registered as partially sighted with an additional disability, 4% have a

mental health condition, 4% have a learning disability, 61% have a physical disability and 30% have a hearing impairment.

Ray (2003) found that male had higher speech disability than females. Out of 100,000 males in the rural areas 242 had speech disability while the corresponding number in the urban areas was 221. On the other hand, 176 and 151 females per 100,000 females had speech disability in rural and urban India, respectively. Most of the states also show a similar pattern. The prevalence rate of speech disability was highest in the state of Kerala (335) followed by Himachal Pradesh (281), Andhra Pradesh (259) and Tamil Nadu (353). Some of the Union territories like Pondicherry and Goa also have very high prevalence rate of speech disability.

According to National Health Survey (2010) 20,000 children between 0-15 years of age were found moderately to severely deaf and approximately 12,000 children between this age range were born deaf. Approximately 28% of people who are hearing impaired are between 16-60 years of age, and 72% are over 60. And 56,400 people were registered as deaf, 156,500 people were registered as difficulty in hearing.

Ray (2003) mentions that the number of persons with hearing disability per 100,000 persons was presented for each sex separately for rural and urban sectors of all-India. The prevalence rate was higher in rural India (310) as compared to that in urban India (236) for males as well as females. Hearing disability was marginally higher among males (319) than among females (301) in rural India while in urban India it was nearly of the same order (234 to 238).

Hearing impairment is the most frequent sensory deficit in human populations, affecting more than 250 million people in the world (Colin *et al*., 2000).

According to WHO 2005, 278 million people have hearing impairment. The prevalence of deafness in Southeast Asia ranges from 4.6% to 8.8%. In India, 63 million people (6.3%) suffer from significant auditory loss. Nationwide disability surveys have estimated hearing loss to be the second most common cause of disability (Garg *et al.,* 2009).

There are over 3.1 million persons with hearing impairment afflicted with moderate or above severity in both the ears, as per 58th round of National Sample Survey Organization (2002).

The Census of India (2001) reports that 1.62 million persons have hearing loss. The World Health Organization (2001) has proposed International Classification

of Functioning, disability and Health as framework to identify persons with activity limitation and participation restriction due to certain body structures, functions and environmental factors. However, 1/1000 live birth is a child with hearing impairment. Over 25,000 children are born deaf every year in India. Of this 40% is due to maternal rubella and another 40% is due to Genetic Mutations (Jung, 2011).

Pleis *et al.*, (2007) in his study found that the prevalence of hearing loss among a sample of US adolescents aged 12 to 19 years was greater in 2005-2006 compared with 1988-1994.Hearing loss is a common sensory disorder, affecting tens of millions of individuals of all ages in The United states.

Gulati (2012) highlighted that the children in low-income families are more malnourished than those in high-income families. This is a serious problem when inadequate protein is consumed because 56% of poor Indian consumed mostly the cereals product rather than the pulses or protein rich food which provides protein in our body.

Prevalence of iron deficiency anaemia was higher among males (41.5%) than females (37.1%) of total mentally disabled children. However, for the age group 6-11 years, anemia was more prevalent in females (27.6) than males (23.9) handicapped children. While, for the age group 11-14 years, the prevalence was higher in males (51.6) than females (42.6) (Abdullah *et al*., 2007).

B. NUTRITIONAL STATUS OF CHILDREN

Neyestani *et al.,* (2010) conducted the study on the Iranian children with physical disability there the mean energy intake was more than 90% of the amount required, mean calcium and iron intakes were 75.8% and 58.7% of the corresponding required amounts but the intakes of protein, calcium and riboflavin were significantly lower in girls than in boys and 40% of disabled girls and boys were underweight. Comparison with anthropometric data from other studies showed that low weight was more prevalent in disabled than in non-disabled children.

Sanchez (2000) found that the children with cerebral palsy showed a higher risk of presenting under nutrition than children with other disabilities, which was three times higher in females. In contrast, children with spina bifida, particularly males, were more likely to be overweight or obese especially after the age of 6 and even more after 11. Patients with muscular dystrophy showed a significantly lower risk of low weight or under nutrition than patients with other disabilities. Low

weight and obesity affect a large number of these patients due to their disability, age and sex in Mexico.

Shabayek *et al*., (2004) discussed that in Alexandria, the incidence of obesity was higher among Down's syndrome and mentally retarded females and among autistic males (19.8%, 16.1% of males versus 15.8%, 6.7% of females with mental retardation and autism were underweight). Hemoglobin levels below the cut-off levels issued by WHO were found higher among autistic and mentally retarded females.

In Nigeria Mid Upper Arm Circumference were found higher for the children with disabilities due to polio .Disabled children with neurological impairments and consequent feeding difficulties are nutritionally at risk, but others are no worse off than their non-disabled peers in this area (Tompsett *et al*., 2010).

Maddah *et al*., (2010) found that malnutrition (low weight and stunting) is quite prevalent among Iranian children with motor disabilities and it is more prevalent in girls than in boys. It seems that poor food composition is a more important contributing factor than total low calorie intake.

According to a United Nations study about 73 per cent children in India were malnourished including underweight (45.9 %) and stunted (25.7%) as reported by Hedge (2007). Overweight and obesity rate is higher in visually impaired children of Spain than children without visual handicaps (Montero, 2005).

Suvarn (2007) observed that more than 50 per cent of Indian school children suffer from sub clinical under nutrition as indicated by low birth weight for age and 65 per cent fall in group which indicates long duration malnutrition.

Nutrition Foundation of India (2009) highlighted that micronutrient deficiencies can be seen not only in undernourished children but also among overnourished children because consumption of vegetables and micronutrient-rich food stuffs are quite low in children. Obesity as well as anaemia or other micronutrient deficiencies have adverse effects on physical performance. And the prevalence of under-nutrition was higher in low income group children as compared to high income group children. The prevalence of over-nutrition was higher in high income group children.

National Nutrition Monitoring Bureau (2005) surveys show that a majority of Indian children subsist on a monotonous diet consisting mainly of cereals with some small amounts of pulses and vegetables. The intake of the entire range of macro and micronutrients is lower than Recommended Dietary Allowances.

Malnutrition is caused by inadequate dietary intake associated with poor physical and mental development especially in children. Reduced physical activity, inadequate high quality protein and other nutrients of disabled children could be the major cause of chronic malnutrition (Rajai, 2001).

In the study done by Pai (2001) found that stunting was a larger problem than wasting of children living in Dharavi , Mumbai and 71% of the total population were identified as being moderate-severely malnourished , 66% were identified as being moderate-severely stunted and 21% were identified as being moderate-severely wasted.

Researchers have found out that low weight was more prevalent in disabled than in non-disabled children, both disabled boys and girls had significantly shorter statures than their non-disabled. The most prevalent cause of motor disability was neurological problems (mostly poliomyelitis, head and spinal injuries) (79%) followed by musculoskeletal disorders (muscular dystrophies, congenital problems) (21%). About 29% of the disabled children in Tehran and Meshed and some 74% of the children in Rasht were able to walk. Swallowing problems were observed in 25.8%, 20.5% and 8.2% of the disabled children in Tehran, Rasht and Meshed, respectively (Neyestani, 2010).

Malnutrition and disability are both major global health problems. There are estimated one billion people worldwide livings with a disability of which some 93 million are children aged under 14 years (WHO, 2011).

Children with cerebral palsy (CP) showed a higher risk of presenting low weight or under nutrition when compared to children with other disabilities. It was significantly higher in children under the age of 6 than in older children. Moreover, risk of low weight or under nutrition was three times higher in females than in males (Walker *et al.*, 2013).

C. CAUSES AND SYMPTOMS OF DISABLED

Tuzun *et al*., (2013) found that, girls with disabilities may present more often as underweight compared to boys with disability in Turkey.

The most common causes of impairment and disability include chronic diseases such as diabetes, cardiovascular disease and cancer; injuries such as those due to road traffic crashes, conflicts, falls, landmines, mental impairments, birth

defects, malnutrition, HIV/AIDS and other communicable diseases. Premature babies are more likely to have a disability because their organs are not completely developed (Thomas, 2008).

Disabilities is caused by hereditary factors like disorders or abnormalities in chromosomes, developmental disorders that affect brain formation, environmental factors like malnutrition of the mother, infections and diseases of the pregnant mother. Dry labor, difficult in birth during delivery, diseases that affect children especially those causing fever like, child malnutrition, accidents and traumas after delivery (Periodical Health Newsletter issued by the Royal Health Awareness Society, 2010).

According to Article 40 of the World Programme of Action (WPA), disability is caused by consideration factors like wars, civil conflicts, poverty, overcrowding and unhygienic living conditions; constraints of resources, geographical distance and physical and social barriers, industrial, agricultural, and transportation-related accidents, natural disasters, stress and psycho-social problems (National Human Rights Commission, 2005).

The Sarva Shiksha Abhiyan programme reports high incidences of disabilities in children (post-polio paralysis, cerebral palsy) attributed to reduced coverage of immunization programmes and poor access to medical services (Sarva Shiksha Abhiyan, 2005).

Royal Health Awareness Society (2010) mentions that hearing disability is caused by hereditary, medicines, smoking, alcohol, pregnancy complications (hypertension and diabetes), malnutrition, lack of oxygen, trauma or delivery injuries during pregnancy, after delivery: such as meningitis, ear infection, mumps, fever, measles, severe injuries, accidents, lack of oxygen, exposure to radiation or some medicines .

Malnourished children can become adults with lower physical and intellectual abilities, lower levels of productivity and high levels of chronic illness and disability (UNICEF, 2000).

Black *et al* .,(2008) studied that malnutrition in pregnant women, infants and children leading to developmental delays and physical, sensory and intellectual

disabilities is well-documented in maternal and child health as well as disability-specific literature.

Maternal malnutrition can affect the development of the foetus, cause intrauterine growth delays and increase the risk of the infant developing impairments. For example, low maternal folate levels are associated with increased risk of the child being born with a neural tube defect (Blencowe *et al.,* 2010*).*

Victora *et al*., (2008) viewed that vitamin D deficiency in pregnant women can result in inadequate calcium supply to the foetus for bone development, potentially leaving the child prone to rickets or with sub-standard bone mineralization.

Anaemia in the mother is associated with low birth weight and traumatic delivery and can affect a child's cognitive development. 42% of pregnant women in low and middle income countries and half of children in pre-school is considered one of the leading causes of disability worldwide as well as increasing the risk of maternal mortality (Walker *et al*., 2011 ;Mac-Gregor *et al.,*2007) .

Black *et al* .,(2013) has studied that maternal obesity can also lead to adverse birth complications such as increased risk of infection and trauma during delivery which may increase the likelihood of the infant developing a disability. Maternal overweight at conception can also lead to the child being overweight and developing chronic diseases in later life.

Low vitamin B12 in breast milk of the mother can lead to developmental delay and neurocognitive impairment. Children who are not breast fed during infancy are more likely to have positive findings when screened for disability at age 2-4. Infants and young children who are underweight and stunted as a result of malnutrition are also more likely to screen positive for disability (Gottlieb *et al.*, 2009).

Maulik and Darmstadt (2007) observed that micronutrient deficiencies, including lack of iodine, iron and vitamin A, and malnutrition related to lack of protein and energy, are considered risk factors for physical, sensory and cognitive impairment.

Iodine deficiency may affect the motor development of young children under age four, and less consistently their cognitive development, with effects on very young children being irreparable (Victora *et al.,* 2008).

Post-natally, a child lacking in macro-nutrients or with sub-optimal nutrition will be more susceptible to infections such as cerebral malaria, or meningitis both of

which have high risk of leaving the affected child with permanent neurological damage and disability (Katona and Apte, 2008)

According to WHO (2012), children with anaemia before age 2 may suffer irreversible delays even if iron is replete at a later age. Malnourished children, such as those with anaemia or rickets, often score lower on language, personal, motor and social development scores compared to expected scores in children of the same age who are not malnourished, in part because the child lacks the ability to engage his parents and caregivers and to interact with the surrounding environment.

Children with disabilities who do not receive enough food or enough nutritious food are susceptible to acquiring secondary conditions (such as stunting or wasting) as a result of micronutrient deficiencies, or in extreme cases may die as a result of severe acute malnutrition (Abdallah *et al.,* 2007)

Werner (2009) emphasized that the difficulties associated with chewing or swallowing food, and feeding difficulties, increasing with the severity of the disability. This may result in poorer health and development outcomes, leading to a perpetuating cycle of suboptimal nutrition, disability and worsening health status.

Victora *et al*., (2008) has studied that malnutrition can also cause structural damage to the brain and affect motor and exploratory skills as well as future cognitive development and schooling.

Recent studies have found that children with disabilities admitted and treated for malnutrition are more than two times more likely to die than non-disabled children due to delayed presentation at the health or nutrition facility; suboptimal care (i.e. not focused on specific needs of disabled children); more severe malnutrition at admission; and lack of follow-up post-discharge from the nutritional treatment facility. Underlying factors such as infections or neglected health care needs of a child with a disability, in particular those with severe impairments may exacerbate issues related to malnutrition and therefore also play a role in leading to higher risk of death (Kerac *et al*., 2012).

Haen and Thompson, (2003) mentioned that lack of food required for growth and development may cause under-nutrition, which refers to a condition resulting from either micronutrient or macronutrient deficiencies, or from both.

Under-nutrition is a condition caused by a lack of food of good nutritional value combined with interaction from infections. Micronutrient deficiency is caused

by poverty, food insecurity, lack of knowledge, and lack of distribution of adequate resources (Nagati *et al.,* 2003).

Faber and Wenhold (2007) states that the three most prevalent micronutrient deficiencies include Iodine Deficiency Disease, Iron Deficiency Anaemia and Vitamin A Deficiency may cause disability.

According to the WHO, World Food Program (WFP) and UNICEF (2007) estimated two billion people across the globe are deficient in key minerals and vitamins.

Malnutrition can cause or contribute directly to disability and disabled children itself can also leads to subsequent malnutrition. This has intergenerational and life-course implications. Poor maternal nutrition can lead to permanent childhood impairments; early life malnutrition can affect health and disability in later life. Though infants and children are especially vulnerable when compared with older children and adults. A malnourished child (whether disabled or not) is at increased risk of developing further debilitating disease, delayed development, and disability or compounded by further disability (WHO, 2012).

According to the disability manual by National Human Rights Commission various indirect causes of disability include malnutrition which is the major cause of disability in India as well as a contributory factor in other ailments that increase susceptibility to disabling conditions. It is estimated that currently 515 million Asians are chronically undernourished, accounting for about two thirds of the world's hungry people (National Human Rights Commission, 2005).

Thomas (2005) studied that the common micronutrient deficiencies that affect disability include Vitamin A deficiency ,Vitamin B complex deficiency ,Vitamin D deficiency ,Iodine deficiency ,Iron deficiency ,Calcium deficiency .He also found that poverty is the biggest cause of disability in India because disabled person are more likely to suffer from malnutrition ,live in crowded and unsanitary conditions ,not immunize their children, lack of adequate care during pregnancy and birth and have multiple pregnancies .

Derrer (2013) studied that the most common causes of intellectual disability are genetic condition which include Down syndrome, problems during pregnancy that can interfere with fetal brain development include alcohol or drug use, malnutrition certain infections, problems during childbirth, illness and infection. And the most common signs of intellectual disability are rolling over, sitting up, crawling, or

walking late, talking late or having trouble with talking, slow to master things like potty training, dressing, and feeding himself or herself, difficulty remembering things, inability to connect actions with consequences, behaviour problems such as explosive tantrums, difficulty with problem-solving or logical thinking.

According to Golden son *et al.,*(2000), physical disabled is cause by birth defects, birth injury, burn injury, brain injury, musculoskeletal disorders, neurological disorders ,movement disorders ,accidents, disease, genetic, short Stature, age etc.

Causes of physically handicapped include skeletal impairments like limitation in movement of joints (either mechanical or due to pain), small limbs, missing limbs, or abnormal trunk size and some major causes of these impairments include arthritis, cerebral Palsy (CP), spinal cord injury, head injury (cerebral trauma), stroke (Cerebral Vascular Accident - CVA), Loss of limbs or digits (Amputation or Congenital) (Kenpro, 2010).

Werner (2009) opined that feeding practices also need to concern as family members may treat a child with disability as an infant, continuing to give a liquid only diet, believing that the child will not be able to take solid foods. This can lead to severe malnutrition and in extreme cases, death.

Children with severe motor disabilities, such as Cerebral Palsy (CP), have many risk factors for osteoporosis. Since vitamin D is essential for normal skeletal development, mineralization, and growth and for maintenance of skeletal health throughout life. They also have feeding problems and suboptimal calcium, vitamin D and other nutrient intakes because of oral-motor difficulties, dysphagia, vomiting, and constipation (Sullivan *et al.,* 2000).

Severe motor disabilities may cause bone loss (Fitzpatrick, 2004). Low bone mass and Bone Mineral Density (BMD) have been observed in a significant proportion of children with Cerebral Palsy (CP) (Henderson *et al.,* 2002).

D.STRESS LEVEL OF PARENTS OF DISABLED CHILDREN

Parents, carers and service providers may also lack knowledge about how to feed their child effectively or how to teach their child to feed themselves. This is especially important for children with conditions such as cerebral palsy who may need special seating or positioning to control muscle spasms or for children with Down's syndrome who are at increased risk of choking and developing pneumonia. Difficult

meal times can lead to increased stress levels for both the caregiver and child, which can result in insufficient food intake (Adams *et al*., 2012).

Stress levels of parents whose children have Developmental Disabilities (DD) are significantly higher than those of parents with typically developing children (Ritzema and Sladeczek *et al*., 2011).

Peterson and Mathieson (2000) mentioned that parents of children with special needs can face uncommon emotional stress, and as a result, frequently experience fear, confusion, stigma, and isolation.

Grohzol (2009) emphasized that raising a child with a disability can cause more daily stress and long-range health problems than parenting a child without disabilities. Parents of children with disabilities had a greater number of stressors and a higher number of days during which they had at least one stressor. They reported having at least one stressor on 50 percent of the study days compared with 40 percent among the other parents. Parents of children with disabilities also reported experiencing a greater number of physical health problems.

Parents of children with Stress in parents of children with development disability has repeatedly been found to be higher than stress in parents of typically developing children (Sladeczek and Miodrag, 2009).

Lack of proper education and illiteracy amongst caregivers, parents and children contribute to the growing malnutrition epidemic. Children are not equipped to make suitable food choices and are dependent on caregivers and parents .Studies have been done to assist in assessing nutritional status, very little has been done on nutrition education as a strategy to improve the quality of life and address malnutrition (UNICEF, 2005).

E. PREVENTION OF DISABLED CHILDREN

Prevention of disabilities is one of the major areas of UNICEF policy. Vaccines and improved nutrition, such as an adequate intake of vitamin A and iodine, not only prevent death and disability but provide a foundation for future learning (UNICEF,1999).

According to Thomas (2008) healthy lifestyle includes nutrition and exercise, as well as staying away from alcohol and drugs during pregnancy can prevent the cause of disability. Policies and Guidelines in India for the protection of the rights of disabled people is covered by four acts in India .They are Mental Health Act 1987 ,

Rehabilitation Council of India Act 1992 , Persons with Disabilities Act 1995 and The National Trust Act 1999.

Early detection and early intervention measures can prevent approximately 70% of the childhood disability caused by vaccine preventable diseases such as polio, malnutrition and micronutrient deficiencies, according to WHO . The good news is that between 80% and 90% of the world's children have been reached by the World Summit for Children quantifiable health and nutrition goals for the year 2000. As a result, fewer children would become disabled from polio or due to vitamin A and iodine deficiencies. In addition, access to basic preventive services is a basic human right of all children guaranteed by the Convention on the Rights of the Child (UNICEF, 1999).

In The New york Times (2014) mentions that disability can be decreased by giving prenatal screening for genetic defects and genetic counselling for families at risk for known inherited disorders. Government nutrition programs are available to poor children in the first and most critical years of life to reduce retardation associated with malnutrition. Environmental programs are also taken up to reduce toxin-associated retardation like exposure to lead, mercury, and other toxins. Increased public awareness of the risks of alcohol and drugs during pregnancy can help reduce the incidence of retardation.

According to Meyer (2008), vaccination is another very important prevention. It prevents diseases for happening. Using vaccination means that diseases may not spread around in schools or community. Some disabilities may be prevented by simple shot or a pill. For example, Polio has been eradicated in the entire Western world. This is because all children are required to get a Polio vaccine .Because most of the people are vaccinated the polio virus cannot spread.

Prevention of health conditions associated with disability is a development issue. Attention to environmental factors including nutrition, preventable diseases, safe water and sanitation, safety on roads and in workplaces can greatly reduce the incidence of health conditions leading to disability(Caulfield *et al*., 2006).

National Association of School Psychologists (2012) highlighted that stress can be prevented by positive problem solving , coping skills ,close , supportive relationships at home and school, with peers and adults, permission and ability to learn from mistakes ,developing competencies (academic, social, extracurricular and

life skills) , positive discipline, ability to express feelings ,feeling physically and emotionally safe and good nutrition ,exercise. etc.

Adequate nutrition and exercise are essential for health, fitness and optimal physical performance. The composition and quantity of food consumed can affect body weight, physical performance, and recovery from exercise. Hence, optimal dietary intake is considered to be one of the critical determinants of physical performance (Manore, 2004).

Werner (2009) mentions that children with disabilities may need additional nutrients to cope with the health problems associated with their disability. For example a child with a physical disability may be prone to pressure sores due to immobility that can become seriously infected. He or she needs a high quality diet for prompt healing and to control infections.

The Royal Health Awareness Society (2010) concerned with the 3 levels of the prevention of disabilities program which includes:-

a) Primary prevention which aims at preventing the occurrence of the causative factor in the cases where the prevention is possible. Pre marriage testing, advising women not to have babies in a very early age (16–20) or between the ages (35 – 40), explaining the importance of family planning, vaccinating girls before getting married or getting pregnant.
b) Secondary prevention which aims at preventing the development of the causative factor till it reaches the stage of functional impairment includes doing the required medical tests, diagnosis and providing medical measurements for all diseases and injuries.
c) Tertiary prevention which aims at preventing the possible complications of disability so it will not develop to handicap. This is achieved through guidance, rehabilitation, special education and adjusting the behaviours.

METHODOLOGY

III. METHODOLOGY

Methodology is generally a guideline for solving a problem, with specific components such as phases, tasks, methods, techniques and tools (Irny and Rose, 2005).

A research design is the specification of methods and procedures for acquiring the information needed. It is the over-all operational pattern or framework of the project that stipulates what information is to be collected from which source by what procedures (Ross, 2010).

Methodology pertaining to the present study on "Assessment of Nutritional Status, Stress level and Quality of life of Special children in Selected School in Coimbatore district" is presented under the following headings:

A. Selection of the area
B. Selection of the sample
C. Selection of the tool
D. Collection of data
E. Assessment of nutritional status ,stress level and quality of life of the special Children
F. Imparting nutrition education
G. Analysis of the data
H. Tools used for analysis

A. SELECTION OF THE AREA

The area chosen for the study was urban areas of Coimbatore district. This area was chosen due to the easy availability and approachability of schools for special children. Another influencing factor was that the higher authorities of the schools and parents of the special children were willing to cooperate and permit to conduct the study.

The list of schools selected for the study is listed below.

1. Bharathi Rehabilitation centre
2. Infant Jesus convent society for Education and Training Hearing Impaired
3. Indian Red Cross Society for Speech and Hearing Impaired
4. Women's Voluntary Services Special School

B.SELECTION OF THE SAMPLE

The type of sampling in which the sample selection depends on the definite purpose is called "Purposive Sampling" (Medhi, 2006).

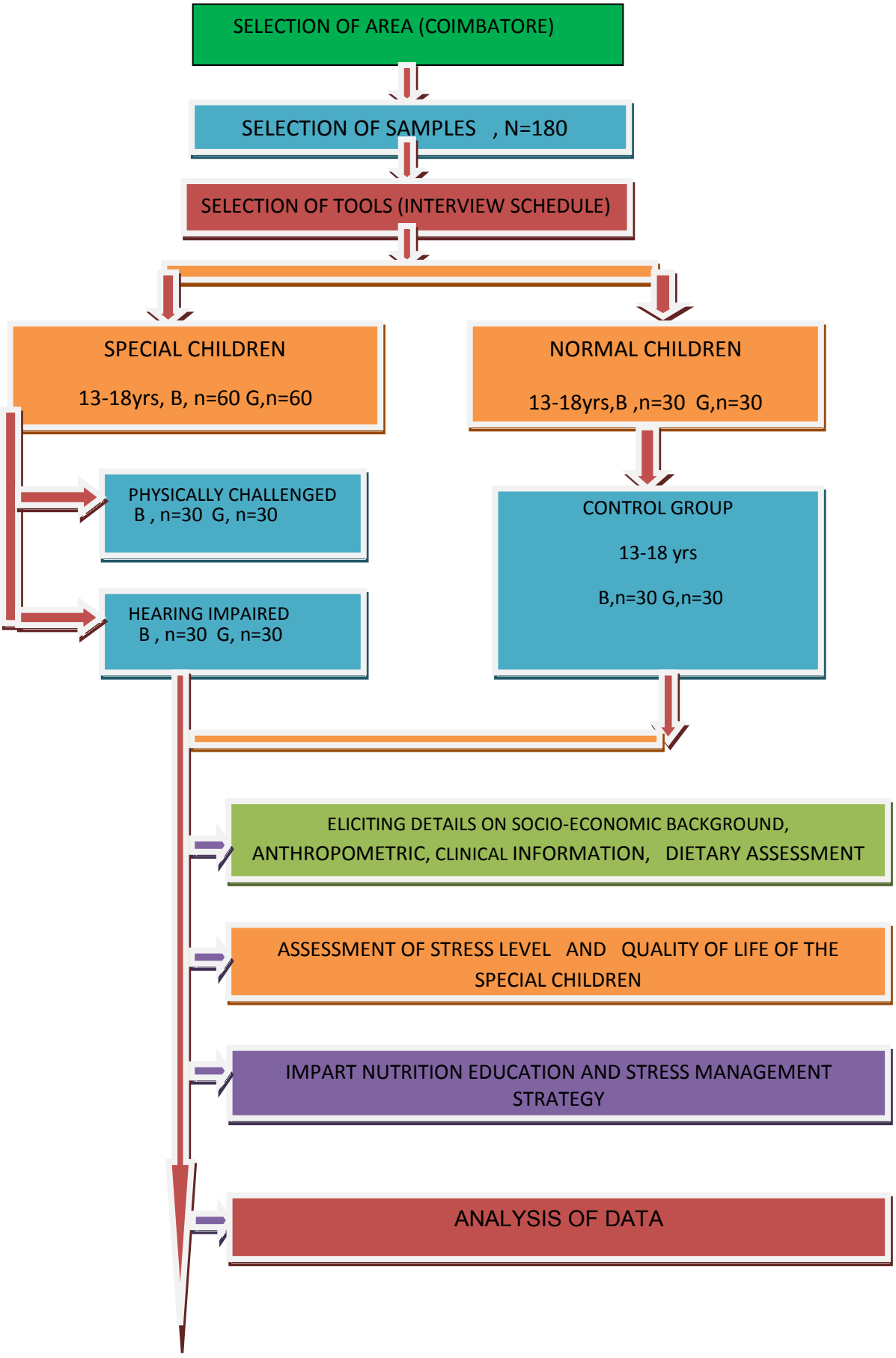
A total of 180 children between the age group of 13 to 18 years were selected purposively for the study. 180 children were divided into three groups consisting of physically handicapped (girls, N=30; boys, N =30), hearing impaired children (girls=30; boys, N=30) and normal children (girls, N=30; boys, N =30).

An interview schedule was administered so as to find out the socio economic, anthropometric, clinical, dietary pattern and life style of the selected special children and also a schedule on stress level and quality of life were also developed to find out the stress and quality of life of the selected special children. A sub sample of 20 percent was selected to find out the nutrient intake.

Simple random sampling is a sampling method in which every sample has an equal probability to being selected. This involves selection of cases which we judge as the most appropriate ones for the given study (Defusco *et al.*, 2011).

Sample is the process of selecting units from a population to get the result in a study. And the selection of a part of a group with a view to obtaining information about the whole is called sampling (Kothari, 2009).

RESEARCH DESIGN



C.SELECTION OF THE TOOL

The tool selected for the study was an interview schedule which was designed by the investigator. Interview is the best and the easiest way to collect the information from the subject (Sharma, 2003).

A structured interview schedule was formulated by the investigator to elicit information regarding the socio-economic status, anthropometric measurement, clinical evaluation, dietary pattern, life style pattern. The formulated interview schedule is shown in Appendix 1.

Obtaining Ethical clearance of the study:

The application form explaining the design and protocols used in the research study was subjected to the Institutional Human Ethics Committee of Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. The Ethical clearance was obtained, the Approval number is AUW/IHEC-13-14/FHP-13.

D. COLLECTION OF THE DATA

Before collection of data consent form was given to the parents for taking permission to conduct the survey from their special children.

The necessary permission was also obtained from the authorities of schools where the study was planned. Nature of the study was explained, possible efforts were made to establish rapport with the teachers, parents and students. By using the interview schedule, data on socio economic, anthropometric, clinical, dietary pattern, life style and health problems faced were gathered from all the students selected. Also the data regarding the stress level and quality of life such as performance at school, difficulty in sleeping, feeling lonely, feeling sad or depressed, psychological support, parent relation, social acceptance of the selected special children was also collected using interview schedule. It is displayed in Plate 1.

E. ASSESSMENT OF NUTRITION STATUS, STRESS LEVEL AND QUALITY OF LIFE OF THE SELECTED SPECIAL CHILDREN

Anthropometric measurement involves obtaining physical measurements of an individual like weight, size and proportion and relating them to standards that reflect the growth and development of the individual. Anthropometric data are most valuable when they reflect accurate measurements and recorded over a period of time (Krause, 2008).

Anthropometric measurements

For each and every individual of the selected special children, height (cm), weight (kg), BMI, waist and hip circumferences were measured using standard equipment and procedures (WHO, 2012).

The most widely used height and weight, commonly referred to as Body Mass Index and the Waist Hip Ratio were calculated using the formula;

The formula is given below-

Body Mass Index = Weight (kg) / Height (m^2).It is expressed in units of kg/ m^2 .

Waist Hip Ratio = Waist circumference (cm) / Hip circumference (cm)

(Patricia *et al.,* 2007). It is shown in Plate 2.

From the information gathered from the selected special children on height, weight, waist, and hip, Body Mass Index and Waist Hip Ratio were calculated for all the selected special children using the above formula.

Clinical assessment: Clinical examination was done to know the deficiency of nutrients in relation to the food they consume by observing their clinical signs characteristic of a deficiency disease.

Dietary survey: Using Semi-quantitative Food Frequency interview schedule, the frequency of consumption of various foods, meal consumption, consumption of carbonated beverage, habit of eating junk foods and twenty four hour diet recall method for 3 days meal intake were collected from 20 % of the main sample of the selected special children.

Life style pattern: Information on type of exercise like yoga, walking, jogging , wrestling, duration and frequency of exercise ,sleeping pattern , timing of study and leisure time activity were also collected.

Knowledge on balanced diets: Information regarding the Knowledge of balance diet of the special children was collected.

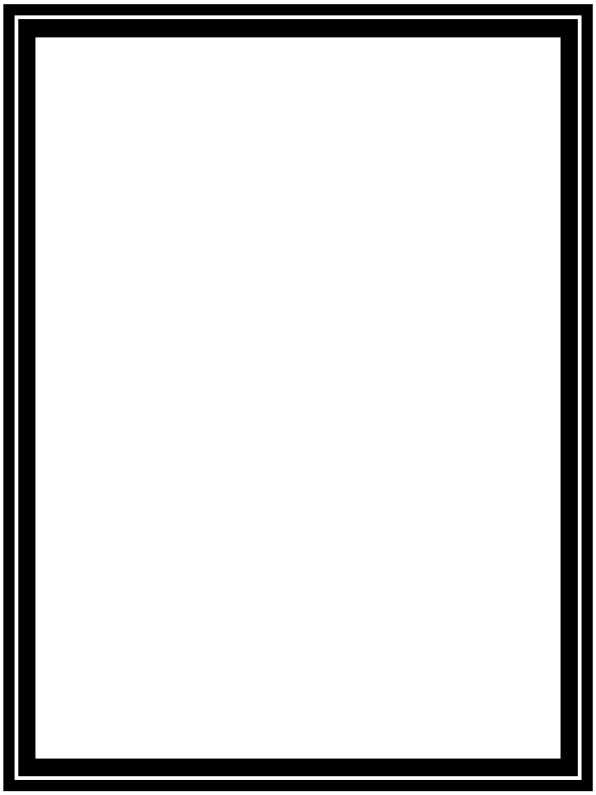
Eating problems: Information regarding the problem associated with eating like anorexia or loss of appetite, allergy of food and the need of assistance of the selected special children was collected.

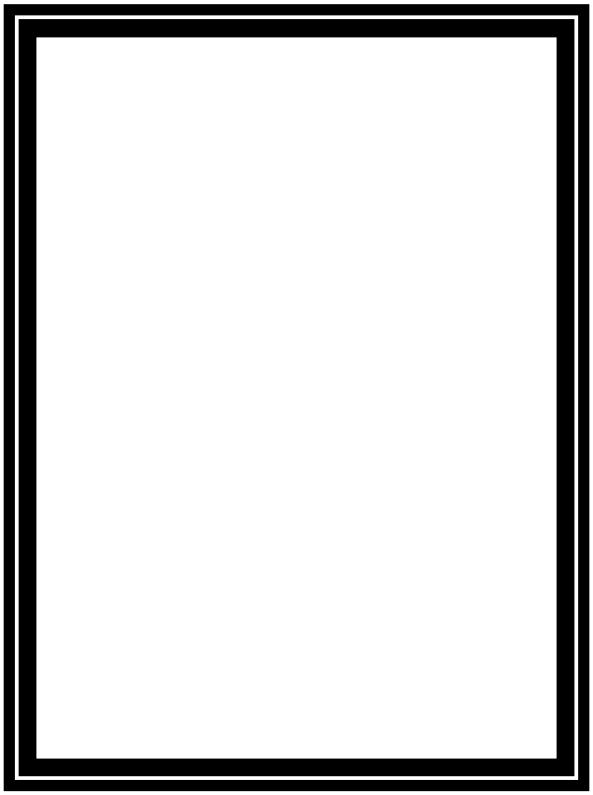
Stress level and quality of life: Stress is a negative emotional experience accompanied by predictable biochemical, physiological, cognitive and behavioural changes that are directed either toward altering the stressful events or accommodating to its effects (Ritzema, 2011).

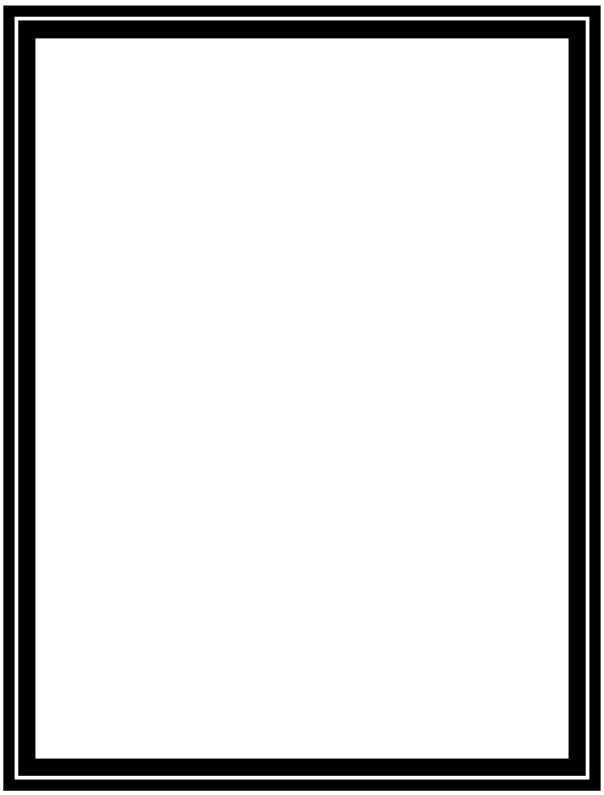
The stress level of the students was recorded using a standard interview schedule formulated by the investigator as per the guide-lines given by the Ministry of Social security, National Solidarity and Reform Institutions. The interview schedule is shows in Appendix 2.

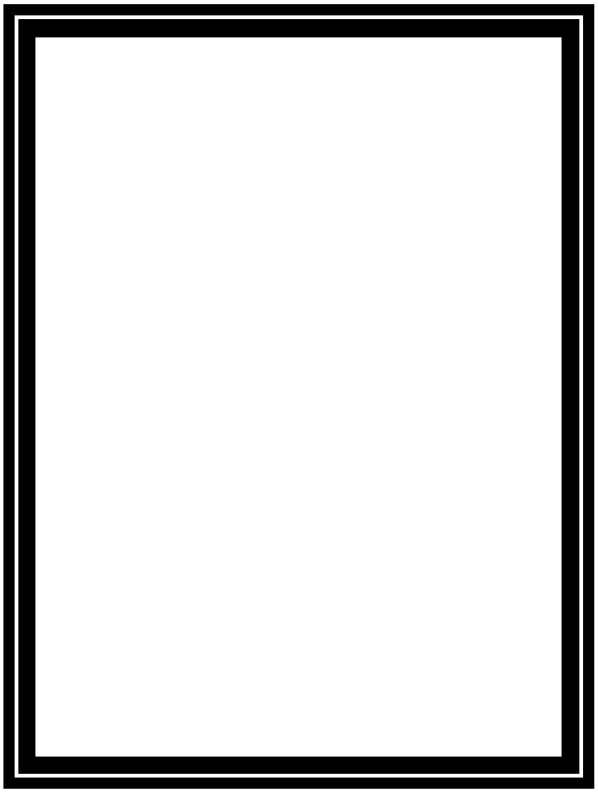
The World Health Organization defines Quality of life as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment"(Oort, 2005).

And the quality of life was also recorded using a interview schedule formulated by the investigator which includes physically, psychological well being ,mood and emotion ,self perception ,parent relation and social acceptance. The interview schedule is shows in Appendix 3.









COLLECTION OF INFORMATION FROM THE PARENTS
(PLATE1)

Measurement of Weight

Measurement of Height

Measurement of Waist circumference

Measurement of Hip Circumference

ANTHROPOMRTRIC MEASUREMENT (PLATE 2)

IMPARTING NUTRITION EDUCATION AND DISTRIBUTION OF FOLDERS (PLATE 3)

F. IMPARTING NUTRITION EDUCATION TO THE PARENTS AND STUDENTS

Nutrition Education is a means of promoting lifelong healthier eating habits by educating people in making the right food choices and in carefully preparing and preserving foods which have a good nutritional value (FAO, 2008).

Nutrition education describing the balanced diet, recommended height, weight, waist and hip measurements for the age was imparted to their parents through counselling individually and also in groups. Stress coping strategies were also explained to the selected special children in schools. Counselling was also given to their parents to improve the quality of life of the children.

For the purpose of imparting education folders ,charts and other visual aids were used (plate 3) which contained the information regarding balanced diet, foods rich in vitamins and minerals , about diet and lifestyle management . Stress coping techniques and information for improving the quality of life were also included.

All the collected data was consolidated and tabulated.

G. ANALYSIS OF DATA

It is one of the most important aspects of research. Since it is highly skilled and technical job, it should be carried out by the researcher himself or under his close supervision. (Khan, 2009).

Once the collection of data is over, the next step is to arrange for processing and analysis of the data so that inferences can be made resulting in formulation of theories. The facts and figures collected are to be processed with a view to reducing them to manageable proportions. Only by such a careful and systemic processing, the data collected will align itself for statistical treatment and meaningful interpretation leading to formulation of a theory based on the findings (Saravanavel, 2007).

Kothari (2009) says that after data collection has to be processed and analyzed in accordance with outline laid down for the purpose at time of developing research plan. Technically processing implies, editing, coding, consolidating and tabulating of collected data so that, it easy to analyzed and discussed the results.

H. TOOLS USED FOR ANALYSIS

To compare the data on quality of life chi square test was used and factor analysis was done to know which factor contributes stress of the selected special children.

Chi-square test:

The study tried to find out the quality of life of the selected special children by using the chi-square analysis. The formula used was

$$\chi^2 = \sum \frac{(O-E)2}{E}$$

Where,

O=Observed frequency and

E=Expected frequency

Factor Analysis:

The study tried to apply the factor analysis to identify the stress level of the special children. Factor analysis attempts to identify underlying variables, or factors, that explain the pattern of correlations within a set of observed variables. Factor analysis is often used in data reduction to identify a small number of factors that explain most of the variance observed in a much larger number of manifest variables. Factor analysis can also be used to generate hypothesis regarding causal relationship between two more variables or to screen variables for subsequent analysis.

In the study Kaiser Criteria is followed a way of reducing all factors with Eigen values more than 0.7. Through factor rotation, factor loadings were found out and the variable with factor loading more than 0.3 were retained Alpha test were applied to find out the significance of factor loading. The Kaiser – Mayer- Elkin ratio was calculated for individual and reliable factors.

The collected data was statistically analyzed, interpreted and discussed under the heading of Results and Discussion.

RESULTS AND DISCUSSION

IV. RESULTS AND DISCUSSION

The results and discussion pertaining to the study on **"Assessment of Nutritional Status, Stress Level and Quality of Life of Special Children"** are discussed in the following headings:-

A. Demographic profile of the selected special children

a. Age and gender of the special children
b. Type and size of the family
c. Income status of the family

B. Anthropometric measurements

a. Height of the special children
b. Weight of the special children
c. Percentiles of the special children
d. Waist to Hip ratio (WHR) of the special children

C. Clinical evaluation of the selected special children

D. Dietary pattern of the selected special children

a. Type of diet followed by the selected special children
b. Meal consumption pattern of selected special children
c. Type and quantity of fats and oils consumed by the special children
d. Consumption of foods
e. Consumption of junk foods
f. Consumption of beverages
g. Consumption of salt
h. Knowledge about balance diet

E. Lifestyle pattern of the selected special children

a. Exercise pattern
b. Sleeping pattern
c. Study time at home and tuition hours

F. Comparative analysis of Stress level and quality of life of the selected special children

A. DEMOGRAPHIC PROFILE OF THE SELECTED SPECIAL CHILDREN

The demographic profile such as age and gender of the special children and type, size and income of the family of the special children were elicited using interview schedule and the detailed result and discussed were given in the following tables.

The age and gender distribution of the selected special children i.e. physically handicapped, hearing impaired and normal children is discussed in the table 4.1

TABLE 4.1

AGE AND GENDER

AGE (13-18)	PHYSICALLY CHALLENGED N=60				HEARING IMPAIRED N=60				NORMAL CHILDREN N=60			
	G		B		G		B		G		B	
	N	%	N	%	N	%	N	%	N	%	N	%
13-14	1	1.7	4	6.7	3	5.0	4	6.7	4	6.7	7	11.7
14-15	3	5.0	4	6.7	3	5.0	4	6.7	2	3.3	2	3.3
15-16	3	5.0	7	11.7	2	3.3	7	11.7	3	5.0	6	10.0
16-17	5	8.3	3	5.0	5	8.3	2	3.3	11	18.3	7	11.7
17-18	18	30.0	12	20.0	17	28.3	13	21.7	10	16.7	8	13.3
TOTAL N=180	30	50.0	30	50.0	30	50.0	30	50.0	30	50.0	30	50.0

The above table shows the age and gender distribution of the selected special children. It was noted that majority of the children were in the age of 17-18 years in each group of which 18 girls and 12 boys of physically handicapped,17 girls and 13 boys of hearing impaired and 10 girls and 8 boys of normal children.

In physically handicapped children, there were only1 girl and 4 boys between the age of 13-14,3girls and 4 boys between the age of 14-15 years, 3girls and 7 boys between the age of 15-16 years, 5 girls and 3 boys between the ages of 16-17 years. In hearing impaired children, 3 girls and 4 boys each in the age group of 13-14 years and 14-15 years, 2 girls and 7 boys were in the age group of 15-16 years, 5 girls and 2 boys were in the age of 16-17 years.

Whereas 4 girls and 4 boys were in the age group of 13-14 years, 2 girls and 2 boys were in the age of 14-15 years, 3 girls and 6 boys were in the age of 15-16, 11 girls and 7 boys were in the age group of 16-17 years in normal children.

The type of family of the selected special children is shown under figure 4.1

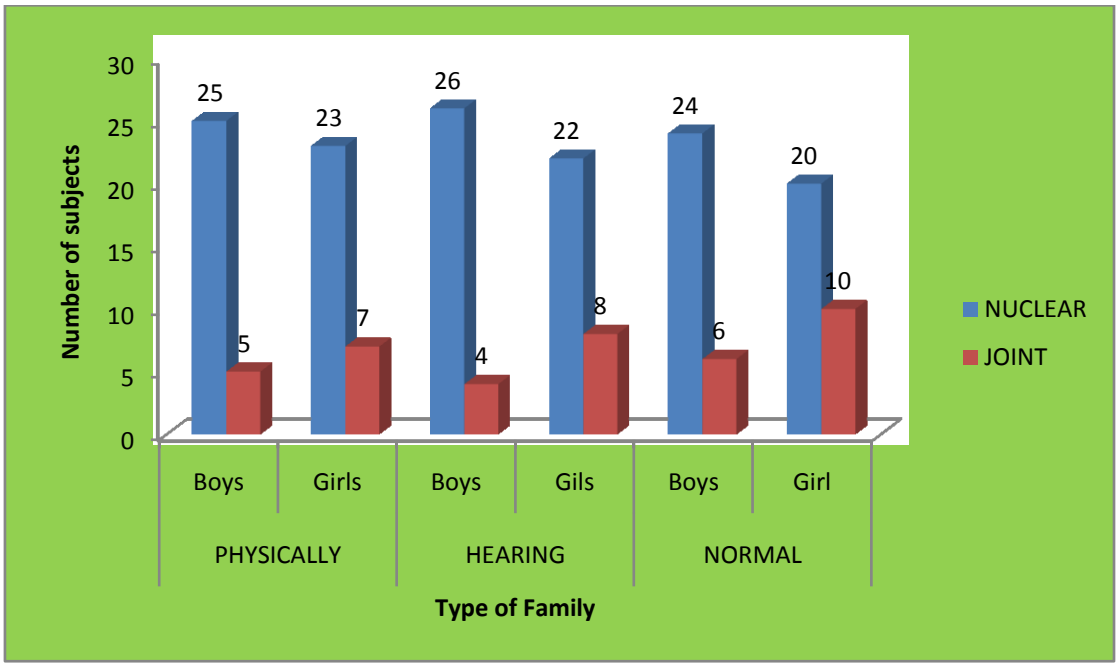


FIGURE 4.1

TYPE OF THE FAMILY

Figure 4.1 shows the type of family (nuclear and joint) of the selected special children.

It revealed that out of 60 children of physically handicapped, 25 boys and 23 girls were belong to nuclear family the remaining 5 boys and 7 girls were from belong to joint family, out of 60 special children from hearing impaired, 26 boys and 22 girls were belong to nuclear family and 4 boys and 8 girls were from joint family. 24 boys and 20 girls of normal children out of 60 belong to nuclear family the remaining 6 boys and 10 girls were from joint family.

Comparing boys and girls, 26 boys from hearing impaired and 23 girls from physically handicapped were belong to the majority of having nuclear family when compared with normal children. Regarding the joint family, 6 boys and 10 girls from

normal children category indicates the majority while comparing with the other two categories i.e. physically handicapped and hearing impaired children.

The size of the family of the selected special children is discussed in the table4.2

TABLE 4.2

SIZE OF THE FAMILY

			13-14	14-15	15-16	16-17	17-18	TOTAL	TOTAL
PHYSICALLY HANDICAPPED	**<3**	**B**	-	1	1	-	-	2	60
		G	-	-	1	2	-	3	
	3-5	**B**	4	3	6	1	9	23	
		G	1	3	2	1	18	25	
	5-8	**B**	-	-	-	1	3	4	
		G	-	-	-	1	-	1	
	>8	**B**	-	-	-	1	-	1	
		G	-	-	-	1	-	1	
HEARING IMPAIRED	**>3**	**B**	-	1	1	-	-	2	60
		G	-	1	1	1	-	3	
	3-5	**B**	4	3	5	-	10	22	
		G	3	2	2	2	17	26	
	5-8	**B**	-	-	-	1	3	4	
		G	-	-	-	1	-	1	
	>8	**B**	-	-	-	1	-	1	
		G	-	-	-	1	-	1	
NORMAL CHILDREN	**>3**	**B**	-	-	-	-	-	-	60
		G	-	-	3	-	1	4	
	3-5	**B**	7	2	6	-	6	21	
		G	3	2	-	9	9	23	
	5-8	**B**	-	-	-	4	2	6	
		G	1	-	-	2	-	3	
	>8	**B**	-	-	-	3	-	3	
		G	-	-	-	-	-	-	

Table 4.2 shows the size of the family of the physically handicapped, hearing impaired and normal children. In physically handicapped children 2 boys and 3 girls were lived with less than 3 members of the family, 23 boys and 25 girls were lived with 3-5 members of the family. 4 boys and 1 girl were lived with 5-8 members of the family,1 girl and 1 boy were lived with more than 8 members of the family.

Regarding hearing impaired children 2 boys and 3 girls were lived with less than 3 members of the family, 22 boys and 26 girls were lived with 3-5 members of the family. 4 boys and 1 girl were lived with 5-8 members of the family, 1 girl and 1 boy were lived with more than 8 members of the family.

In normal children, 3 girls were lived with less than 3members of the family and no boys were living less than 3 members of the family, 21 boys and 23 girls were lived with 3-5 members of the family. 6 boys and 3 girls were lived with 5-8 members of the family, 3 boys were lived with more than 8 members of the family and no children were living more than 8 members of the family. Comparing the boys and girls, 26 girls from hearing impaired and 23 boys from physically handicapped shows the majority of having 3-5 members of the family.

The total family income of the selected special children is discussed in the table 4.3

TABLE 4.3
TOTAL FAMILY INCOME

			13-14	14-15	15-16	16-17	17-18	TOTAL	
PHYSICALLY HANDICAPPED	**<3000**	B	-	-	-	-	-	-	60
		G	-	-	-	-	-	-	
	3000-7000	B	-	-	2	1	1	4	
		G	-	1	-	1	3	5	
	7000-10000	B	3	4	3	1	8	19	
		G	1	1	2	3	7	14	
	>10000	B	1	-	2	1	3	7	
		G	-	1	1	1	8	11	
HEARING IMPAIRED	**<3000**	B	-	1	1	-	-	2	60
		G	1	-	1	-	-	2	
	3000-7000	B	4	-	5	1	-	-	
		G	-	3	-	3	9	15	
	7000-10000	B	-	-	1	-	10	11	
		G	2	-	1	2	5	10	
	>10000	B	-	3	-	1	3	7	
		G	-	-	-	-	3	3	
NORMAL CHILDREN	**<3000**	B	-	-	-	-	-	-	60
		G	-	-	-	-	-	-	
	3000-7000	B	3	-	1	2	1	7	
		G	1	2	-	1	2	6	
	7000-10000	B	-	-	1	-	5	6	
		G	2	-	3	9	8	22	
	>10000	B	4	2	4	5	2	17	
		G	1	-	-	1	-	2	

*Hudco classification 2010.

The family income per month of the parents is given in this table 4.3 which show those 22 Parents of girls from normal children and 19 parents of boys from physically handicapped had an Income of rupees 7000 to 10,000 which shows the majority while comparing the three groups and only 17 parents of boys had an income above 10,000.

B. ANTHROPOMETRIC MEASUREMENT

Nutritional status of special children were evaluated by anthropometric measurements like weight (kg), height (cm), Waist Hip Circumference (WHC) measured by using weighing balance and measuring tape. The weight of the special children is discussed in the table 4.4

TABLE 4.4
WEIGHT OF THE SPECIAL CHILDREN (kg)

	Weight in kg		13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	20-30	B	-	-	-	-	-	-
		G	-	-	-	-	-	-
	31-40	B	2	1	2	3	5	13
		G	-	1	1	2	3	7
	41-50	B	1	3	5	0	4	13
		G	1	2	1	3	10	17
	51-60	B	1	-	-	-	3	4
		G	-	-	1	-	5	6
	>60	B	-	-	-	-	-	-
		G	-	-	-	-	-	-
HEARING IMPAIRED	20-30	B	3	-	-	-	-	3
		G	-	-	-	-	-	-
	31-40	B	-	3	5	-	-	8
		G	-	3	-	-	2	5
	41-50	B	1	1	1	-	3	6
		G	1	-	1	-	7	9
	51-60	B	-	-	-	1	4	5
		G	2	-	-	4	6	12
	>60	B	-	-	1	1	6	8
		G	-	-	1	1	2	4
NORMAL CHILDREN	20-30	B	-	-	-	-	-	-
		G	-	-	-	-	-	-
	31-40	B	1	-	-	-	-	1
		G	-	-	1	1	1	3
	41-50	B	2	1	2	4	2	11
		G	2	-	-	5	7	14
	51-60	B	3	1	3	3	5	15
		G	2	-	-	5	7	14
	>60	B	1	-	1	-	1	3
		G	-	-	-	1	-	1

With regard to the weight measurement, table 4.4 shows that in physically handicapped, 13 boys and 7 girls were in the weight range of 31-40 kg. 13 boys and 17 girls were in the weight range of 41-50 kg. 4boys and 6 girls were in the weight range of 51-60 kg. None of the children were in the weight range of 20-30 kg and above 60 kg.

Regarding hearing impaired, 3 boys were in the weight range of 20-30 kg. 8 boys and 5 girls were in the weight range of 31-40 kg. 6 boys and 9 girls were in the weight range of 41-50 kg. 5 boys and 12 girls were in the weight range of 51-60 kg. 8 boys and 4 girls were in the weight range above 60 kg.

In normal children no children were in the weight range of 20-30 kg. 1 boy and 3 girls were in the weight range of 31-40 kg. 11 boys and 14 girls were in the weight range of 41-50 kg. 15 boys and 14 girls were in the weight range of 51-60 kg. 3 boys and 1 girl were in the weight range above 60.

The heights of the selected special children students are discussed in table the 4.5.

TABLE 4.5

HEIGHT OF THE SPECIAL CHILDREN (cm)

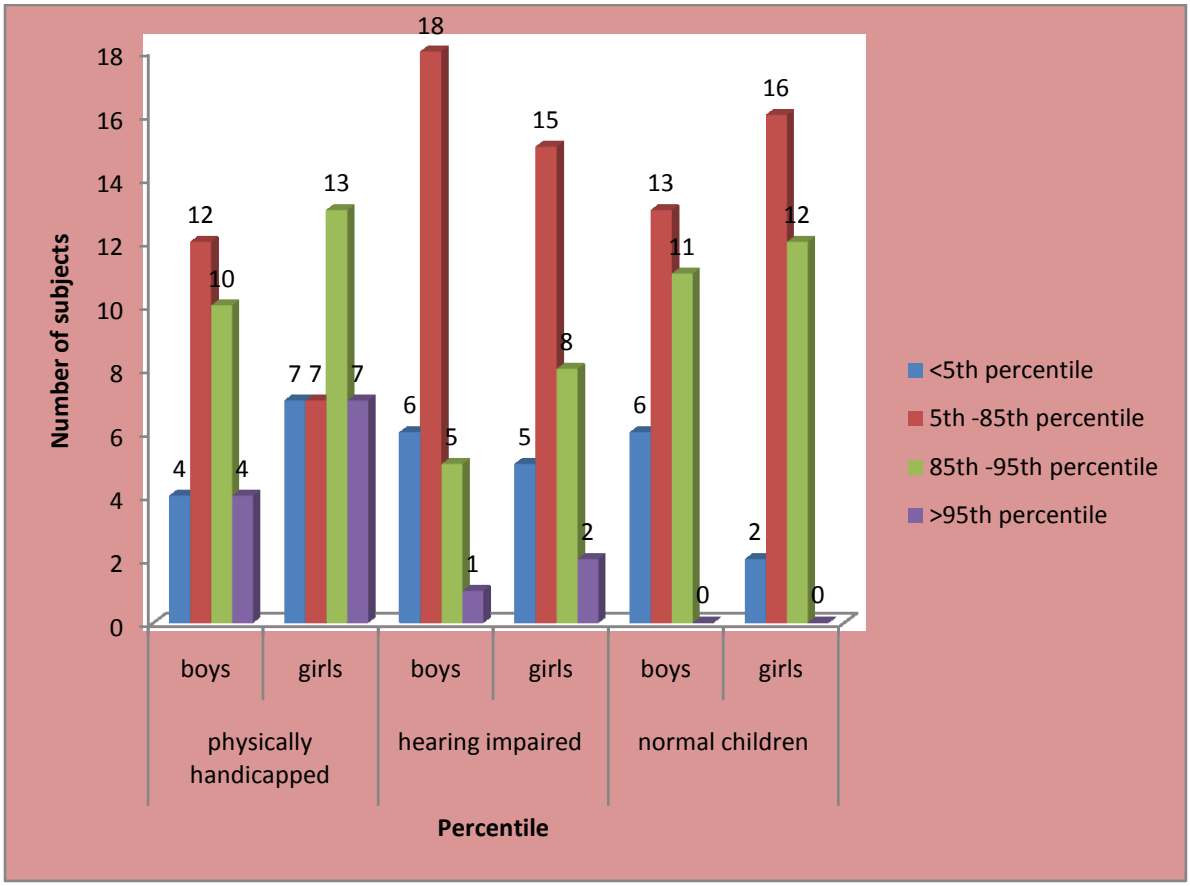
	Height(cm)		13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	140-150	B	1	-	-	2	1	4
		G	-	-	1	-	3	4
	151-160	B	2	1	4	-	7	14
		G	-	-	2	3	11	16
	161-170	B	1	3	2	-	4	10
		G	-	3	-	1	4	8
	>170	B	-	-	1	1	-	2
		G	1	-	-	1	-	2
HEARING IMPAIRED	140-150	B	4	-	1	-	-	5
		G	-	3	-	2	3	8
	151-160	B	-	3	4	-	3	10
		G	1	-	2	1	14	18
	161-170	B	-	1	2	-	7	10
		G	2	-	-	2	-	4
	>170	B	-	-	-	2	3	5
		G	-	-	-	-	-	-
NORMAL CHILDREN	140-150	B	4	-	2	-	1	7
		G	1	1	-	2	1	5
	151-160	B	2	2	-	1	1	6
		G	1	1	2	6	4	14
	161-170	B	1	-	4	2	4	11
		G	2	-	1	2	5	10
	>170	B	-	-	-	4	2	6
		G	-	-	-	1	-	1

The above table shows that in physically handicapped children 4 boys and 4 girls were in a height range of 141-150 cm. 14 boys and 16 girls were in the height range of 151-160 cm. 10 boys and 8 girls were in the height range of 161-170 cm. 2 boys and 2 girls were in the height range of above 70 cm.

Regarding hearing children 5 boys and 8 girls were in a height range of 141-150 cm. 10 boys and 18 girls were in the height range of 151-160 cm. 10 boys and 4 girls were in the height range of 161-170 cm. 5 boys and no girl were in the height range of above 70 cm. In normal children , 7 boys and 5 girls were in a height range of 141-150 cm. 6 boys and 14 girls were in the height range of 151-160 cm. 11 boys

and 10 girls were in the height range of 161-170 cm. 6 boys and 1 girl were in the height range of above 70 cm.

The percentile of the selected special children is discussed in the figure 4.2



Source: WHO, 2007

FIGURE 4.2

PERCENTILE OF THE SPECIAL CHILDREN

Percentile values of physically handicapped, hearing impaired and normal children were shown in figure 4.2. The table highlights the prevalence of underweight, normal, overweight and obesity, among the special children.

From the above figure it is clear 18 boys from hearing impaired and 16 girls from normal children had that majority of having normal range of 5^{th} -85^{th} Percentile that was considered to be "Normal weight".6 boys each in both normal and hearing impaired children had the majority of having underweight i.e. $<5^{th}$ percentile .11 boys from normal children and 13 girls from physically handicapped had the majority of having overweight i.e. 85^{th} -95^{th} Percentile and 4 boys and 7 girls from physically handicapped were found obesity.

The waist hip ratio of the special children is discussed in figure 4.3.

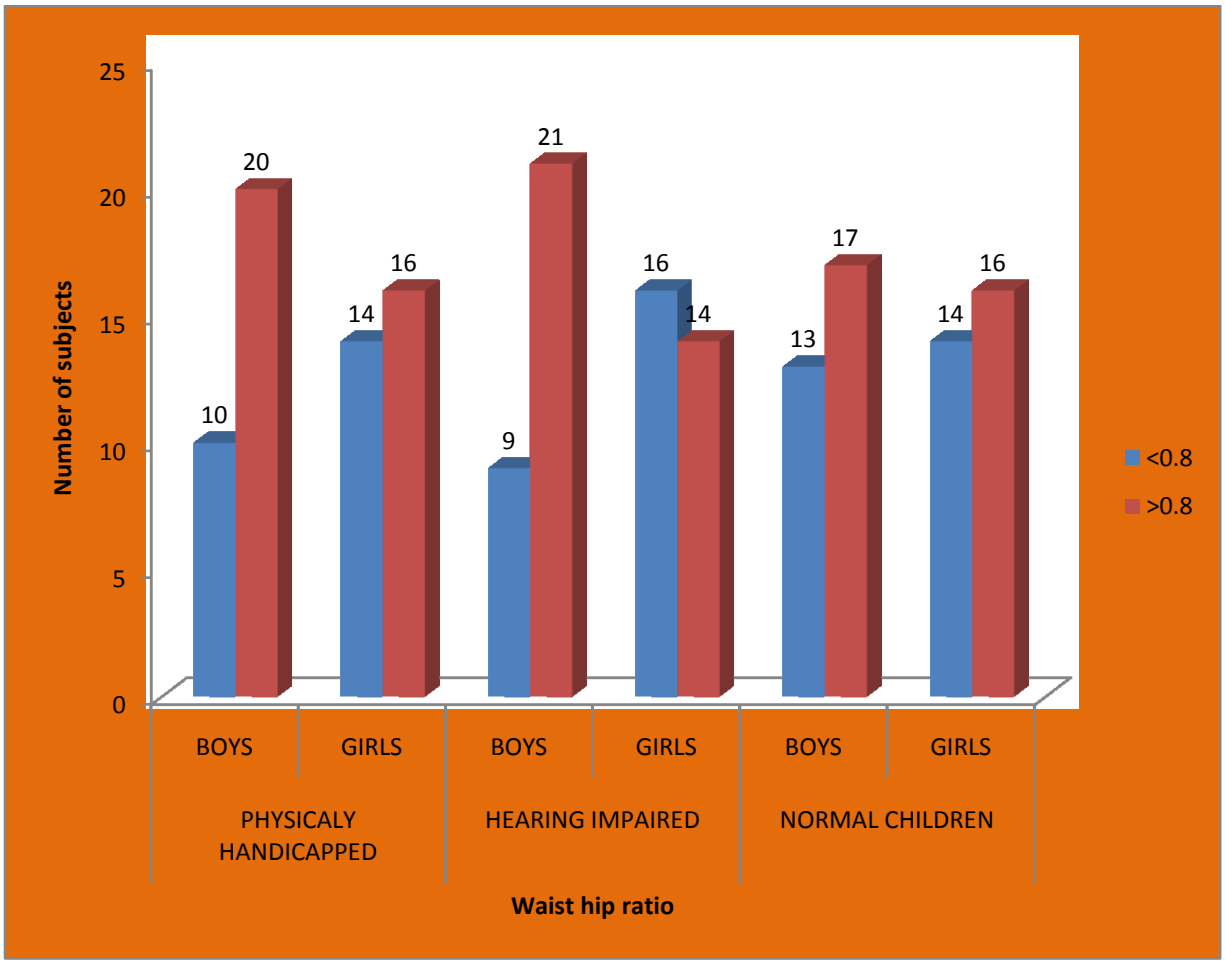


FIGURE 4.3

WAIST HIP RATIO (WHR)

Figure 4.3 shows the waist-hip ratio of the selected special children. 10 boys and 14 girls from physically handicapped children were in < 0.8 range. Remaining 20 boys and 16 girls were under the value waist hip ratio > 0.8.Regarding hearing impaired children 9 boys and 6 girls were in < 0.8 range. Remaining 21 boys and 14 girls were under the value waist hip ratio > 0.8. 13 boys and 14 girls from normal children were in < 0.8 range. Remaining 17 boys and 16 girls were under the value waist hip ratio > 0.8.

C. CLINICAL EVALUATION

The clinical examination was done for all the selected special children .Out of 180 children, 10 girls and 11 boys from hearing impaired, 3 girls and 2 boys from

normal children and 8 girls and 12 boys from physically handicapped children were found to have muscle wasting which shows the symptoms of protein deficiency. Out of 180 children, 1 girl and 3 boys from hearing impaired, 1 boy and 1 girl each from normal children and 1 girl from physically handicapped children were found to have pale cornea and 12 girls and 11 boys from hearing impaired, 3 girls and 1 boy from normal children, 6 girls and 8 boys from physically handicapped children were found to have night blindness which shows the symptoms of Vitamin A deficiency.

In hearing impaired children 8 girls and 6 boys from hearing impaired, 4 boys and 3 girls from normal children and 5 boys and 4 girls from physically handicapped children were found to have spoon shaped nails which shows the symptoms of iron deficiency.11 girls and 11 boys from hearing impaired, 1 boy and 1 girl each from normal children, 4 girls and 7 boys from physically handicapped children were found to have angular stomatitis which shows that they had Vitamin C deficiency.

Out of 180 children 3 girls and 2 boys from hearing impaired, 8 girls and 3 boys from normal children and 3 girls and 1 boy from physically handicapped children were found to have adiposity and 7 girls and 2 boys from hearing impaired, 4 girls and 4 boys each from normal children and 1 girl and 2 boys from physically handicapped children were found to have edema which shows the symptoms of obesity.

D.DIETARY PATTERN

The dietary pattern of the selected special children is given in the Table 4.6

TABLE 4.6

DIETARY PATTERN

			13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	Vegetarian	B	1	-	-	1	3	5
		G	1	-	1	2	5	9
	Non-vegetarian	B	3	3	7	1	9	23
		G	-	2	2	3	11	18
	Ova-vegetarian	B	-	1	-	1	-	2
		G	-	1	-	-	2	3
HEARING IMPAIRED	Vegetarian	B	3	-	3	-	3	9
		G	-	-	-	2	5	7
	Non-vegetarian	B	1	4	3	2	10	20
		G	3	3	1	3	11	21
	Ova-vegetarian	B	-	-	1	-	-	1
		G	-	-	1	-	1	2
NORMAL CHILDREN	Vegetarian	B	1	-	1	5	3	10
		G	2	1	1	2	2	8
	Non-vegetarian	B	6	2	3	2	4	17
		G	2	-	2	9	7	20
	Ova-vegetarian	B	-	-	2	-	1	3
		G	-	1	-	-	1	2

From the table 4.6 it can be noted that 5 boys and 9 girls were vegetarians, 23 boys and 18 girls were non vegetarians and 2 boys and 3 girls were ova-vegetarians in physically handicapped children. Regarding hearing impaired 9 boys and 7 girls were vegetarians, 20 boys and 21 girls were non vegetarians and 1 boy and 2 girls were ova-vegetarians and 10 boys and 8 girls were vegetarians, 17 boys and 20 girls were non vegetarians and 3 boys and 2 girls were ova-vegetarians in normal children.

The meal consumption of the selected special children is discussed in the table 4.7

TABLE 4.7

MEAL CONSUMPTION PER DAY

			13-14	14-15	15-16	16-17	17-18	TOTAL	TOTAL
PHYSICALLY HANDICAPPED	<3	B	-	2	-	-	4	6	60
		G	-	-	1	2	4	7	
	3	B	1	1	5	3	2	12	
		G	1	2	1	2	6	12	
	>3	B	3	1	2	-	6	12	
		G	-	1	1	1	8	11	
HEARING IMPAIRED	<3	B	1	2	5	-	7	15	60
		G	2	3	1	3	10	19	
	3	B	2	1	2	-	4	9	
		G	1	-	-	1	4	6	
	>3	B	1	1	-	2	2	6	
		G	-	-	1	1	3	5	
NORMAL CHILDREN	<3	B	3	2	4	1	7	17	60
		G	3	2	1	6	7	19	
	3	B	3	-	2	6	1	12	
		G	-	-	1	4	2	7	
	<3	B	1	-	-	-	-	1	
		G	1	-	1	1	1	4	

From the study it can be revealed that 6 boys and 7 girls consumed less than three meals per day. 12 boys and 12 girls consumed three meals per day. 12 boys and 11 girls consumed more than three meals a day in physically handicapped children. Regarding hearing impaired children, 15 boys and 19girls consumed less than three meals per day. 9 boys and 6 girls consumed three meals per day. 6 boys and 5 girls consumed more than three meals a day and in normal children 17 boys and 19 girls were consumed less than three meals per day. 12 boys and 7 girls consumed three meals per day. 1 boy and 4 girls consumed more than three meals a day in physically handicapped children. Comparing all the three categories it was found that majority of the selected physically handicapped children did not have regular eating times as most of the children need assistance while having food.

The consumption of fat and oil of the selected special children is discussed in the table 4.8

TABLE 4.8

CONSUMPTION OF FAT AND OIL

	Fat and oil		13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	**Saturated fat (ghee, butter, Vanaspathi)**	B	1	-	1	-	-	2
		G	-	-	-	3	-	3
	PUFA (sesame oil, Ground oil)	B	3	2	5	2	9	21
		G	1	2	3	2	15	23
	MUFA (sunflower, corn oil, Rice bran oil)	B	-	2	1	1	3	7
		G	-	1	-	-	3	4
HEARING IMPAIRED	**Saturated fat (ghee, butter, Vanaspathi)**	B	-	-	-	-	2	2
		G	-	1	-	-	1	2
	PUFA (sesame oil, Ground oil)	B	3	3	6	1	8	21
		G	3	1	2	4	10	20
	MUFA (sunflower, corn oil, Rice bran oil)	B	1	1	1	1	3	7
		G	-	1	-	1	6	8
NORMAL CHILDREN	**Saturated fat (ghee, butter, Vanaspathi)**	B	-	-	-	-	1	1
		G	-	-	-	-	-	1
	PUFA (sesame oil, Ground oil)	B	6	2	6	7	7	28
		G	3	2	2	11	10	28
	MUFA (sunflower, corn oil, Rice bran oil)	B	1	-	-	-	-	1
		G	-	-	1	-	-	1

From the present study it is observed that majority of the special children i.e., 28 girls and 28 boys used refined sunflower oil and rice bran oil for cooking purposes, some oils like ghee, hydrogenated oil, gingerly oil, groundnut oil were used occasionally in their cooking.

The total quantity of oil used per month of the selected special children is discussed in the table 4.9.

TABLE 4.9

TOTAL QUANTITY OF OIL USED PER MONTH

	Quantity in lts		13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	<0.5	B	1	-	-	-	1	2
		G	1	2	-	-	3	6
	0.5-1	B	1	3	5	3	3	15
		G	-	1	1	2	9	13
	1-1.5	B	-	-	-	-	4	4
		G	-	-	1	1	3	5
	>2	B	2	1	2	-	4	9
		G	-	-	1	2	3	6
HEARING IMPAIRED	<0.5	B	-	-	1	-	5	6
		G	1	2	-	2	4	9
	0.5-1	B	3	1	2	-	5	11
		G	-	-	-	1	4	5
	1-1.5	B	1	-	3	-	2	6
		G	-	1	1	1	5	8
	>2	B	-	3	1	2	1	7
		G	2	-	1	1	4	8
NORMAL CHILDREN	<0.5	B	3	-	1	1	-	5
		G	1	-	-	2	1	4
	0.5-1	B	2	-	3	6	1	12
		G	-	1	2	4	3	10
	1-1.5	B	-	1	-	-	3	4
		G	1	1	-	3	2	7
	>2	B	2	1	2	-	4	9
		G	2	-	1	2	4	9

The consumption of fat and oil of the selected special children was shown in table 4.9. Majority of the boy's i.e.15 and 13 girls from physically handicapped children, 11 boys and 5 girls from hearing impaired and 12 boys and 10 girls from normal children used 0.5 to 1 litre of oil per month.9 boys and 6 girls from physically handicapped, 7 boys and 8 girls from hearing impaired and 9 boys and 9 girls were using more than two litre per month. These factors had directly contributed to obesity.

The consumption of food of selected special children is discussed in the table 4.10

TABLE 4.10

CONSUMPTION OF FOODS BY THE SELECTED SPECIAL CHILDREN

Food Items	AGE (13-14)						AGE (14-15)						AGE(15-16)						AGE (16-17)						AGE (17-18)					
	B			G			B			G			B			G			B			G			B			G		
	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O
PHYSICALLY HANDICAPPED																														
Cereals	4	-	-	1	-	-	3	1	-	2	1	-	6	1	-	2	1	-	3	-	-	3	2	-	10	2	-	18	-	-
Pulses and Legumes	1	2	1	-	1	-	2	1	1	1	2	-	2	4	1	-	3	-	1	2	-	-	5	1	-	12	-	2	14	1
GLV	2	2	-	1	-	-	2	2	-	1	2	-	3	4	-	-	2	1	2	-	1	-	5	-	4	7	1	6	12	-
Other Vegetables	-	2	2	-	-	1	-	3	1	-	1	2	-	6	1	-	2	1	-	-	3	-	3	2	-	4	8	-	7	11
Root& Tubers	-	3	1	-	-	1	-	2	2	-	1	1	-	5	2	-	2	1	-	1	2	-	1	4	-	2	10	-	4	14
Fruits	1	1	2		-	1	-	1	3	-	1	2	-	5	2	-	-	3	-	-	3	-	-	5	1	3	8	2	3	13
Milk& Milk products	3	-	1	-	1	-	-	-	4	1	-	2	2	3	2	1	-	2	1	-	2	-	4	1	5	5	2	3	8	7
Nuts & Oil Seeds	-	1	3	-	1	-	-	-	4	-	1	2	1	1	5	-	1	2	1	-	2	2	1	2	-	3	9	1	3	14
Meat ,fish and poultry	-	-	4	-	1	-	-	1	3	-	-	3	-	1	6	-	-	3	-	-	3	-	1	4	-	2	10	-	5	13
HEARING IMPAIRED																														
Cereals	4	-	-	3	-	-	4	-	-	3	-	-	7	-	-	1	1	-	2	-	-	5	-	-	11	2	-	16	1	-
Pulses and Legumes	1	3	-	1	1	1	-	4	-	-	3	-	-	7	-	-	1	1	1	1	-	1	3	1	3	10	-	2	15	-
GLV	2	1	1	1	2	-	-	4	-	3	-	-	2	4	1	1	1	-	1	1	-	4	1	-	4	8	1	4	13	-
Other Vegetables	-	1	3	-	1	2	-	-	4	-	1	2	-	2	5	-	1	1	-	2	-	-	1	4	-	7	6	-	9	8
Root & Tubers	-	1	3	-	2	1	-	1	3	-	1	2	-	2	5	-	-	2	-	2	-	-	2	3	-	5	8	-	5	12

Fruits	1	-	3	-	1	2	1	1	2	-	1	2	-	3	4	-	-	2	-	2	-	-	1	4	2	2	9	3	2	12
Milk& Milk products	2	1	1	-	1	2	1	1	2	1	1	1	1	3	3	-	2	-	-	1	1	2	-	3	2	4	7	4	7	6
Nuts& Oil Seeds	-	-	4	2	-	1	-	2	2	-	1	2	2	1	4	-	1	1	-	-	2	-	-	5	-	6	7	3	3	11
Meat ,fish and poultry	-	-	4	-	-	3	-	-	4	-	-	3	-	1	6	-	1	1	-	1	1	-	-	5	-	2	11	-	5	12

NORMAL CHILDREN																															
Cereals	7	-	-	4	-	-	2	-	-	2	-	-	6	-	-	3	-	-	6	1	-	11	-	-	4	4	-	8	2	-
Pulses and Legumes	-	7	-	1	3	-	-	2	-	-	2	-	1	5	-	1	2	-	-	7	-	3	8	-	2	5	1	2	8	-
GLV	2	4	1	1	3	-	-	2	-	1	1	-	4	1	-	1	2	-	2	5	-	5	5	1	1	7	-	4	6	-
Other Vegetables	-	2	5	-	3	1	-	1	1	-	1	1	-	1	5	-	2	1	-	1	6	-	4	7	-	6	2	-	6	4
Root & Tubers	-	3	4	-	1	3	-	-	2	-	-	2	-	1	5	-	-	3	-	4	3	-	2	9	-	5	3	-	5	8
Fruits	1	-	6	1	3	-	-	-	2	-	-	2	-	1	5	1	-	2	1	1	5	2	2	7	1	2	5	2	3	5
Milk& Milk products	2	2	3	1	3	-	-	1	1	-	-	2	1	2	3	1	-	2	3	3	1	3	3	5	1	5	2	1	1	8
Nuts& Oil Seeds	2	1	4	2	-	2	-	1	1	-	1	1	-	1	5	-	-	3	1	1	5	2	2	7	2	3	3	2	3	5
Meat ,fish and poultry	-	-	7	-	-	4	-	-	2	-	1	1	-	-	6	-	1	2	-	-	7	-	3	8	-	4	4	-	1	9

D*-Daily

W*-Weekly

O*-Occasionally

TABLE 4.11
CONSUMPTION OF JUNK FOODS

Items	13-14						14-15						15-16						16-17						18-19					
	B			G			B			G			B			G			B			G			B			G		
PHYSICALLY HANDICAPPED	D*	W*	O*	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O	D	W	O
Baked items	-	3	1	-	1	-	-	4	-	2	1	0	-	6	1	-	3	0	-	2	1	-	5	-	2	9	1	2	14	2
Chat items	-	3	1	-	-	1	-	2	2	-	2	1	-	4	3	-	2	1	-	2	1	-	4	1	-	7	5	-	12	6
Fried items	-	4	0	-	-	1	-	3	1	-	2	1	3	2	2	-	2	1	2	1	0	-	5	-	2	6	4	3	13	2
Sweet	-	-	4	-	1	-	-	2	2	-	1	2	1	3	3	-	1	2	-	-	3	-	3	2	-	4	8	-	6	12
Pizza	-	-	`4	-	-	`1	-	-	4	-	-	3	-	-	7	-	-	3	-	-	3	-	-	5	-	1	11	-	2	16
Burger	-	1	3	-	-	1	-	-	4	-	-	3	-	-	7	-	1	2	-	-	3	-	-	5	-	2	10	-	2	16
HEARING IMPAIRED																														
Baked items	-	4	-	-	2	1	1	2	1	-	3	-	2	5	-	-	2	-	-	2	-	-	5	-	1	1	2	1	13	3
Chat items	-	1	3	-	2	1	-	2	2	-	2	1	-	5	2	-	1	1	-	1	1	-	4	1	-	5	8	-	10	7
Fried items	-	3	1	-	1	2	1	3	-	-	3	-	1	6	-	-	1	1	2	-	-	2	3	-	3	4	6	-	13	4
Sweet	-	1	3	-	1	2	-	1	3	-	1	2	-	2	5	-	1	1	-	1	1	1	1	3	-	6	7	-	5	12
Pizza	-	-	`4	-	2	1`	-	-	4	-	-	3	-	-	7	-	-	2	-	-	2	-	-	5	-	1	12	-	1	16
Burger	-	-	4	-	-	3	-	1	3	-	-	3	-	-	7	-	-	2	-	1	1	-	1	4	-	1	12	-	2	15
NORMAL CHILDREN																														
Baked items	1	6	-	-	4	-	-	2	-	-	1	1	1	4	1	-	3	-	1	6	-	1	10	1	2	5	1	1	7	2
Chat items	-	5	2	-	3	1	-	1	1	-	1	1	-	2	4	-	3	-	-	2	5	-	7	4	-	6	2	-	7	3
Fried items	3	3	1	-	2	2	1	1	-	-	2	-	3	3	-	2	1	-	1	5	1	1	9	1	-	6	2	3	7	-
Sweet	1	3	3	-	1	3	-	-	2	-	-	2	1	3	2	-	-	3	1	3	3	-	3	8	-	2	6	-	4	6
Pizza	-	1	6	-	-	4	-	-	2	-	-	2	-	-	6	-	-	3	-	-	7	-	-	11	-	-	8	-	1	9
Burger	-	-	7	-	-	4	-	-	2	-	1	1	-	-	6	-	-	3	-	-	7	-	1	10	-	1	7	1	2	7

The above table 4.11 shows that, out of 60 physically handicapped children, 29 boys and 49 girls had the majority of the children within the age group of 17-18 yrs who have the habit of eating junk food items weekly 39 boys and 54 girls were found to have junk food items occasionally and 4 boys and 5 girls from 18-19yrs had the habit of eating baked items and fried foods daily.

Regarding the hearing impaired children, 27 boys and 44 girls had the majority of children within the age group of 17-18 yrs. who had the habit of eating junk food items weekly.67boys and 44 girls were found to have junk food items occasionally and 2 boys and 4 girls had the habit of eating baked and fried items daily. And out of 60 normal children, 20 boys and 21 girls had the majority of children having the habit of eating junk food items weekly, 26 boys and 35 girls had the habit of having the junk foods occasionally whereas 16 boys and 8 girls had the habit of eating baked, fried and sweets items daily.

The consumption of beverages of the selected special children is discussed in the table 4.12

TABLE 4.12
CONSUMPTION OF BEVERAGE

	Beverage Consumption *		13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	No	B	1	1	2	-	2	6
		G	-	-	-	2	3	5
	Tea	B	-	2	3	1	2	8
		G	1	-	-	-	4	5
	Coffee	B	-	1	1	1	-	3
		G	-	1	-	1	6	8
	Milk	B	3	-	1	1`	8	13
		G	-	3	3	2	6	12
	Health drink	B	-	-	-	-	-	-
		G	-	-	-	-	-	-
HEARING IMPAIRED	No	B	-	1	1	1	-	3
		G	2	-	-	-	1	3
	Tea	B	2	1	-	-	4	7
		G	1	-	-	1	4	6
	Coffee	B	1	-	1	-	1	3
		G	1	-	1	2	4	8
	Milk	B	1	1	3	1	6	12
		G	-	3	-	2	8	13
	Health drink	B	-	1	2	-	3	6
		G	-	-	1	-	1	2
NORMAL CHILDREN	No	B	-	-	1	-	3	4
		G	-	-	1	2	2	5
	Tea	B	2	2	-	1	-	5
		G	2	-	1	3	2	8
	Coffee	B	3	-	2	2	-	7
		G	1	1	-	-	-	2
	Milk	B	2	2	-	4	4	12
		G	1	1	-	5	4	11
	Health drink	B	-	1	1	1	1	4
		G	1	1	1	2	-	5

* Multiple responses

The above table 4.12 shows that 13 boys from physically handicapped children,12 boys each from hearing impaired children and normal children consumed milk whereas 12 girls from physically handicapped ,13 girls from hearing impaired and 11 girls from normal children consumed milk comparing to the another two group of children.

Tea, coffee and health drinks were consumed in less amount by most of the children in each category. A regular consumption of black tea throughout the day helps to maintain mental alertness and reduce fatigue. Most of the children consumed beverages most often at early morning time before going to school and evening time after coming back from school.

Health drinks like Horlicks, bournvita etc. were consumed by few children in two categories but none of the physically handicapped children consumed any health drinks because they may lead to obesity as their physical movement is less comparing to the another two categories.

The consumption of salt of the selected special children is discussed in the table 4.13

TABLE 4.13
CONSUMPTION OF SALT

	Quantity in gms		13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	**< 1tsp/day**	B	2	2	4	3	8	19
		G	1	2	3	3	11	20
	> 1 tsp	B	2	2	3	0	4	11
		G	0	1	0	2	7	10
HEARING IMPAIRED	**< 1tsp/day**	B	3	3	5	1	7	19
		G	1	3	1	5	11	21
	> 1 tsp	B	1	1	2	1	6	11
		G	2	0	1	0	6	9
NORMAL CHILDREN	**< 1tsp/day**	B	3	1	2	1	4	19
		G	4	2	2	8	4	20
	> 1 tsp	B	3	1	2	1	4	11
		G	0	0	1	3	6	10

The above table highlights the consumption of salt by the selected specialchildren.11 boys in each group and 10 girls each in physically handicapped and normal children consumed more than 5 gram of salt. Remaining 19 boys each in the entire three category, 20 each in

physically handicapped and normal children and 21 girls in hearing impaired consumed less than 5 grams of salt.

The knowledge about balance diet of the selected special children is discussed in the table 4.14

TABLE 4.14
KNOWLEDGE ABOUT BALANCE DIET

CHILDREN	PHYSICALLY HANDICAPPED								HERAING IMPAIRED								NORMAL CHILDREN							
	Yes				No				Yes				No				Yes				No			
	B	%	G	%	B	%	G	%	B	%	G	%	B	%	G	%	B	%	G	%	B	%	G	%
13-14	-	-	-	-	4	7	1	2	1	2	-	-	3	5	3	5	1	2	2	3	6	10	2	3
14-15	-	-	-	-	4	7	3	5	1	2	1	2	3	5	2	3	1	2	1	2	1	2	1	2
15-16	-	-	1	2	7	2	2	3	2	3	1	2	5	8	1	2	1	2	1	2	5	8	2	3
16-17	-	-	1	2	3	5	4	7	1	2	2	3	1	1	3	5	-	-	2	3	7	11	9	15
17-18	2	3	3	5	10	16	15	25	-	-	1	2	3	22	16	27	1	2	1	2	7	11	9	15
TOTAL	2	3	5	9	28	48	25	43	5	9	5	9	25	42	25	42	4	8	7	12	26	44	23	38

Table-4.14 shows the percentage of children who had the knowledge or awareness about balance diet. In physically handicapped children,3 percent of boys and 9 percent of girls had the knowledge about balance diet and 48 percent of boys and 43 percent of girls doesn't had the knowledge of balance diet .But as in the case of normal children and hearing impaired children 8 percent of boys and 12 percent of girls,9 percent each of both boys and girls had the knowledge of balance diet and 44 percent of girls and 38 percent of boys ,42 percent each of girls and boys doesn't had the knowledge about the balance diet respectively.

The nutrient intake of the selected special children is discussed in the table 4.15

TABLE 4.15
NUTRIENT INTAKE OF THE SELECTED SPECIAL CHILDREN

SPECIAL CHILDREN	Protein	Fat	Fiber	CHO	Energy	Calcium	Iron	Carotene	Folic Acid	Vitamin C
	gm.	gm.	gm.	gm.	Kcal	mg	mg	µg	µg	mg
RDA (boys)	**70**	**22**	**30**	**300**	**2450**	**600**	**41**	**2400**	**100**	**40**
Actual intake of physically handicapped	43.51	19.75	10.42	206.86	1310.14	385.42	14.95	1199.23	95.69	30.10
Actual intake of hearing impaired	45.61	30.10	23.25	315.05	1987.07	457.04	20.57	1442.23	101.01	28.07
Actual intake of normal children	50.59	35.37	27.76	327.59	2015.37	502.57	39.07	1927.52	97.06	31.07
RDA (girls)	**65**	**22**	**30**	**300**	**2060**	**600**	**50**	**2400**	**100**	**40**
Actual intake of physically handicapped	39.67	16.45	15.42	198.76	1308.7	287.25	17.09	1275.2	75.72	28.78
Actual intake of hearing impaired	51.28	32.10	25.75	325.05	1989.65	372.79	19.75	1352.7	85.79	30.09
Actual intake of normal children	49.67	30.89	28.09	359.27	2157.32	387.25	30.09	1872.57	89.07	32.09

Nutrient intake of the selected special children was calculated and it was compared with the Recommended Dietary Allowance (RDA).Comparing girls and boys of physically handicapped children, boy's intake like carbohydrate, fat and energy was higher than the intake girls. In the case of hearing impaired children, girl's intake is more than boys like fat carbohydrate and energy. In the case of normal children boy's intake was higher when compared to girls. Regarding the other nutrients like fiber, calcium, iron, carotene, folic acid and vitamin C was in less amount when compared with the Recommended Dietary Allowance (RDA).

E. LIFE STYLE PATTERN

The exercise pattern of the selected special children is discussed in table 4.16

TABLE 4.16
EXERCISE PATTERN

CHILDREN	PHYSICALLY HANDICAPPED								HEARING IMPAIRED								NORMAL CHILDREN							
	Yes				No				Yes				No				Yes				No			
	B	%	G	%	B	%	G	%	B	%	G	%	B	%	G	%	B	%	G	%	B	%	G	%
13-14	1	2	1	2	3	5	-	-	2	3	3	5	2	3	-	-	5	8	2	3	2	3	2	3
14-15	-	-	-	-	4	7	3	5	3	5	1	2	1	2	2	3	1	2	1	3	1	2	1	2
15-16	3	5	1	2	4	6	2	3	4	6	1	2	3	5	1	2	4	6	3	5	2	3	-	-
16-17	2	3	4	7	1	2	1	2	1	2	3	5	1	2	2	3	3	5	10	16	4	6	1	2
17-18	3	5	6	10	9	15	12	20	4	6	11	18	9	15	6	10	5	8	6	10	3	5	4	6
TOTAL	9	15	12	21	21	36	18	30	14	24	19	31	16	26	11	18	18	30	22	36	12	20	8	13

Table 4.16 shows the exercise pattern of the selected special children. Comparing the three categories, children from normal group used to do exercise i.e. 30 percent of boys and 37 percent of girls whereas 15 percent boys and 21 percent girls from physically handicapped and 24 percent and 32 percent from hearing were doing exercise. Remaining 20 percent boys and 13 percent girls from normal children, 21 percent of boys and 18 percent girls from physically handicapped and 27 percent of boy's and18 percent of boys from hearing impaired children were not performing exercise.

The duration of exercise of the selected special children is discussed in table 4.17

TABLE 4 .17
DURATION OF EXERCISE

	Duration in min		13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	<30 mins/day	B	-	1	1	-	3	5
		G	-	-	1	-	6	7
	30 - 60mins/day	B	-	1	6	3	5	15
		G	-	3	1	3	6	13
	> 1 hour	B	4	2	-	-	4	10
		G	1	-	1	2	6	10
HEARING IMPAIRED	<30 mins/day	B	1	2	2	1	3	9
		G	3	-	-	3	9	15
	30 -60 mins/day	B	2	1	2	1	5	11
		G	-	1	2	2	3	8
	> 1 hour	B	1	1	3	-	5	10
		G	-	2	-	-	5	7
NORMAL CHILDREN	<30 mins/day	B	-	1	1	1	1	4
		G	-	1	1	1	1	4
	30 -60 mins/day	B	3	1	3	1	4	12
		G	3	2	2	3	8	18
	> 1 hour	B	4	1	3	3	3	14
		G	1	-	1	4	2	8

Table 4.17 explains about the duration of doing exercise of the special children .5 boys and 7 girls from physically handicapped ,9 boys and 15 girls from hearing impaired and 4 boys and 4 girls each from normal children were doing exercise less than 30 minutes. About 15 boys and 13 girls from physically handicapped, 11 boys and 8 girls from hearing impaired and 12 boys and 18 girls from normal children were performing exercise for 30mins to 1 hour. Remaining 10boys and 10 girls each from physically handicapped, 10 boys and 7 girls from hearing impaired and 14 boys and 8 girls from normal children were doing exercise for one hour. Children were performing exercises like cycling, walking and yoga.

The sleeping pattern of the selected special children were discussed in table 4.18

TABLE 4 .18
SLEEPING PATTERN

			13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	< 4 hours	B	1	-	2	-	6	9
		G	-	1	2	-	5	8
	4-6 hours	B	1	1	3	1	4	10
		G	1	-	1	2	8	12
	6-8hours	B	1	2	1	2	2	8
		G	-	1	-	2	5	8
	>8hours	B	1	1	1	-	-	3
		G	-	1	-	1	-	2
HEARING IMPAIRED	< 4 hours	B	-	1	-	1	2	4
		G	1	-	-	2	2	5
	4-6 hours	B	1	-	-	-	-	1
		G	-	-	-	1	2	3
	6-8hours	B	1	2	3	1	7	14
		G	2	1	2	-	8	13
	>8hours	B	2	1	4	-	4	11
		G	-	2	-	2	5	9
NORMAL CHILDREN	< 4 hours	B	-	-	-	-	1	1
		G	-	-	-	1	-	1
	4-6 hours	B	3	1	1	-	-	5
		G	-	-	-	-	1	1
	6-8hours	B	4	1	5	3	4	17
		G	3	1	2	5	7	18
	>8hours	B	-	-	-	4	3	7
		G	1	1	1	5	2	10

Most of the selected special children i.e. 8 boys and 8 girls each from physically handicapped, 14 boys and 13 girls from hearing impaired and 17 boys and 18 girls from normal slept for 6-8 hours. And 10 boys and 12 girls from physically handicapped, 1 boy and 3 girls from hearing impaired and 5 boys and 1 girl from normal slept about 4-6 hours. Only 8 boys and 3 girls from physically handicapped, 11 boys and 9 girls from hearing impaired and 7 boys and

10 girls from normal slept more than 8 hours.

The study hours of the selected special children is discussed in table 4.19

TABLE 4 .19
STUDYING HOURS AT HOME

			13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	**<1 hour/day**	**B**	2	3	4	-	10	19
		G	-	2	3	-	15	20
	1-2 hour/day	**B**	1	1	3	-	2	7
		G	1	1	-	1	2	5
	>2 hour/day	**B**	1	-	-	3	-	4
		G	-	-	-	4	1	5
HEARING IMPAIRED	**<1 hour/day**	**B**	1	1	2	2	6	12
		G	1	3	1	3	7	15
	1-2 hour/day	**B**	3	3	3	-	6	15
		G	1	-	1	2	9	13
	>2 hour/day	**B**	-	-	2	-	1	3
		G	1	-	-	-	1	2
NORMAL CHILDREN	**<1 hour/day**	**B**	2	-	-	-	3	5
		G	3	-	1	1	1	6
	1-2 hour/day	**B**	2	-	4	3	1	10
		G	-	-	1	6	6	13
	>2 hour/day	**B**	3	2	2	4	4	15
		G	1	2	1	4	3	11

Table- 4.19 shows the study hours at home. Compare the three category of special children, majority of the physically handicapped children spent less than one hour in studying, regarding hearing impaired children 15 boys and 13 girls spent one to 2 hours for studying and 15 boys and 11 girls from normal children spent more time 2 hours for studying.

The extra hour's duration of tuition classes of the selected special children is discussed in table 4.20

TABLE 4.20
EXTRA HOURS CLASSES

			13-14	14-15	15-16	16-17	17-18	TOTAL
PHYSICALLY HANDICAPPED	**No**	**B**	2	3	4	-	10	19
		G	-	2	3	-	15	20
	1-2 hour/day	**B**	1	-	1	3	1	6
		G	-	-	-	4	2	6
	>2 hour/day	**B**	1	1	2	-	1	5
		G	1	1	-	1	1	4
HEARING IMPAIRED	**No**	**B**	4	3	6	2	11	26
		G	3	3	1	3	15	25
	1-2 hour/day	**B**	-	1	-	-	-	1
		G	-	-	-	-	1	1
	>2 hour/day	**B**	-	-	1	-	2	3
		G	-	-	1	2	1	4
NORMAL CHILDREN	**No**	**B**	1	-	1	1	4	7
		G	1	-	1	1	2	5
	1-2 hour/day	**B**	5	2	4	3	2	16
		G	2	2	2	7	6	19
	>2 hour/day	**B**	1	-	1	3	2	7
		G	1	-	-	3	2	6

Nearly 6 boys and 6 girls each from physically handicapped, 1girl and 1 boy from hearing impaired, 16 boys and 19 girls from normal attended extra coaching hours (tuition) for one to two hours. And 19 boys and 20 girls from physically handicapped, 26 boys and 25 girls from hearing impaired and 7 boys and 5 girls from normal children did not spend extra hours in going tuition.

The table clearly highlights the extra hour classes attended by the selected special children. Only 5 boys and 4girls from physically handicapped, 3 boys and 4 boys from normal children and 7 boys and 6 girls from normal children spent time for tuition more than two hours.

F. COMPARATIVE ANALYSIS OF STRESS LEVEL AND QUALITY OF LIFE OF THE SELECTED SPECIAL CHILDREN

1. Factor analysis : (Stress level of special children)

To resolve the 20 statements related to the stress level of hearing impaired, normal children and physically handicapped number of variables, factor analysis technique was applied. To find out whether all the 20 variables could be used for the analysis KMO & Bartlett's test of Sphericity were applied. The following table- 4.21 gives the results of KMO and Bartlett's test of Sphericity on the opinion of the sample units in stress level of special children.

TABLE -4.21
KMO AND BARTLETT'S TEST

Method		Hearing Impaired	Normal Children	Physically Handicapped
Kaiser-Meyer-Elkin Measure of Sampling Adequacy		.543	.512	.509
Bartlett's Test of Sphericity	Approx. Chi-square	211.598	226.382	212.287
	Degrees of Freedom	190	190	190
	Significance	.000	.000	.000

Source: Estimates based on field survey, 2013.

The results of KMO & Bartlett's test of Sphericity revealed that factor analysis could be carried out with the 20 selected variables effectively. Principal component analysis and rotation method of variance and Kaiser Normalization were applied to extract factors. The communality obtained for the 20 variables are given in the following table –4.22

TABLE- 4.22
COMMUNALITIES

Variables	Stress level of special children		
	Hearing Impaired	**Normal Children**	**Physically Handicapped**
1	.833	.617	.782
2	.667	.733	.680
3	.728	.786	.692
4	.737	.562	.738
5	.573	.704	.697
6	.747	.853	.654
7	.685	.709	.906
8	.480	.822	.553
9	.657	.655	.589
10	.772	.596	.741
11	.700	.703	.686
12	.847	.722	.677
13	.795	.788	.743
14	.548	.748	.767
15	.731	.732	.646
16	.685	.687	.706
17	.783	.742	.606
18	.625	.578	.728
19	.722	.694	.659
20	.760	.718	.652
Extraction Method: Principal Component Analysis.			

Source: Estimates based on field survey, 2013.

The communalities of all the 20 variables were above .5 indicating that a good percentage of variance in the variables was explained by the factors. To find out how many factors are to be retained, Eigen values were obtained.

The Estimated Eigen values are given in the following table 4.23

TABLE-4.23
EIGEN VALUE

Factor	Initial Eigen values					
	Hearing Impaired		Normal Children		Physically Handicapped	
	Eigen Value	% of Variance	Eigen Value	% of Variance	Eigen Value	% of Variance
1	2.595	12.977	2.659	13.297	2.536	12.680
2	1.874	9.371	1.998	9.990	2.158	10.792
3	1.809	9.044	1.746	8.730	1.712	8.560
4	1.492	7.460	1.611	8.055	1.649	8.247
5	1.476	7.381	1.315	6.575	1.429	7.149
6	1.413	7.065	1.307	6.537	1.215	6.079
7	1.245	6.223	1.247	6.236	1.103	5.519
8	1.130	5.650	1.218	6.092	1.091	5.455
9	1.041	5.205	1.054	5.272	1.016	5.081

Source: Estimates based on field survey, 2013

Stress level of special children in Hearing impaired 9 factors with Eigen values exceeding one were retained for the analysis. These 9 factors could explain 70% of the variations in the 20 variables related to Stress level of special children in Hearing impaired.

Stress levels of special children in Normal children 9 factors with Eigen values greater than one were retained. These 9 factors could explain about 71% of the variations in the 20 variables in the 20 variables related to Stress level of special children in normal children.

Stress levels of special children in physically handicapped children 9 factors with Eigen values greater than one were retained. These 9 factors could explain about 70% of the variations in the 20 variables in the 20 variables related to physically handicapped. When all the 180 respondents were combined together in analyzing the reasons for Stress level of special children in physically handicapped children.

Using varimax rotation, factor loadings were estimated and the following table – 4.24, 4.25 and 4, 16 exhibits the highest loading (after rotation) of the variables into factors.

Table – 4.24
Rotated Component Matrix – Stress level of special children in Hearing Impaired

Factors / Variable	1	2	3	4	5	6	7	8	9
I cannot pay attention in class			0.88						
I do not understand what my teacher teaches								0.61	
I am not sure if I am able to do well in school	0.68								
My attendance is poor								0.79	
I am often late for class	0.58								
I have too many assignments									0.80
I feel there is too much to do with tuition and school homework	0.73								
I do not get enough pocket money					0.64				
I do not have enough money to pay for my basic expenses		0.63							
My parents control how much money I spend						0.67			
I have trouble getting along with family members		0.58							
I have no friends/ I feel lonely							0.89		
I feel insecure because of too much competition in getting good grades and a good job						0.78			
I feel I am left with hardly any time for exercise						0.59			
I have gained/ lost weight		0.82							
I am tired and sleeping more/less than normal.				0.73					
I feel sad/ depressed									0.54
I feel nobody cares for me					0.74				
I feel have I too much pressure because of my studies and examinations				0.80					
I no longer do things once I very much liked to do			0.57						

Source: Estimates based on field survey, 2013.

According to the loadings of the variables, among the 9 factors for Stress level of special children in Hearing Impaired, factor1 was highly loaded on I am not sure if I am able to do well school (0.68), I am often late for class (0.58) and I feel there is too much to do with tuition and school homework (0.73).

Factor2 was highly loaded on I do not have enough money to pay for my basic expenses (0.63), I have trouble getting along with family members(0.58) and I have gained/ lost weight (0.82).Factor3 was highly loaded on I cannot pay attention in class (0.88), and I no longer do things once I very much liked to do (0.57).

Factor4 was highly loaded on I am tired and sleeping more/less than normal (0.73) and I feel have I too much pressure because of my studies and examinations (0.80). Factor 5 was highly loaded I do not get enough pocket money (0.64) and I feel nobody cares for me (0.74)**.**

Factor 6 was highly loaded on My parents control how much money I spend (0.67), I feel insecure because of too much competition in getting good grades and a good job (0.78) and I feel I am left with hardly any time for exercise (0.59). Factor 7 was highly loaded I have no friends/ I feel lonely (0.89).

Factor 8 was highly loaded on I do not understand what my teacher teaches (0.61) and I am not sure if I am able to do well in school (0.79). Factor 9 was highly loaded on I have too many assignments (0.80) and I feel sad/ depressed (0.54).

Table-4.25
Rotated Component Matrix – Stress level of special children in Normal Children

Factors / Variable	1	2	3	4	5	6	7	8	9
I cannot pay attention in class	0.58								
I do not understand what my teacher teaches	0.65								
I am not sure if I am able to do well in school						0.73			
My attendance is poor							0.67		
I am often late for class								0.57	
I have too many assignments									0.90
I feel there is too much to do with tuition and school home work							0.61		
I do not get enough pocket money						0.78			
I do not have enough money to pay for my basic expenses				0.59					
My parents control how much money I spend								0.55	
I have trouble getting along with family members		0.51							
I have no friends/ I feel lonely		0.62							
I feel insecure because of too much competition in getting good grades and a good job					0.88				
I feel I am left with hardly any time for exercise			0.84						
I have gained/ lost weight							0.65		
I am tired and sleeping more/less than normal.		0.78							
I feel sad/ depressed				0.81					
I feel nobody cares for me									
I feel have I too much pressure because of my studies and examinations	0.66								
I no longer do things once I very much liked to do	0.80								

Source: Estimates based on field survey, 2013

According to the loadings of the variables, among the 9 factors for Stress level of special children in Normal Children, factor1 was highly loaded on I cannot pay attention in class (0.58), I do not understand what my teacher teaches (0.65), I feel have I too much pressure because of

my studies and examinations (0.66) and I no longer do things once I very much liked to do (0.80).

Factor2 was highly loaded on I have trouble getting along with family members (0.51), I have no friends/ I feel lonely (0.62) and I am tired and sleeping more/less than normal (0.78). Factor3 was highly loaded on I feel I am left with hardly any time for exercise (0.84). Factor4 was highly loaded on I do not have enough money to pay for my basic expenses (0.59) and I feel sad/ depressed (0.81).

Factor 5 was highly loaded I feel insecure because of too much competition in getting good grades and a good job (0.88). Factor 6 was highly loaded I am not sure if I am able to do well in school (0.73) and I do not get enough pocket money (0.78).

Factor 7 was highly loaded my attendance is poor (0.67), I feel there is too much to do with tuition and school home work (0.61) and I have gained/ lost weight (0.65). Factor 8 was highly loaded I am often late for class (0.57) and my parents control how much money I spend (0.55). Factor 9 was highly loaded I have too many assignments (0.90).

Table -4.26
Rotated Component Matrix – Stress level of special children in Physically handicapped Children

Factors / Variable	1	2	3	4	5	6	7	8	9
I cannot pay attention in class						0.86			
I do not understand what my teacher teaches	0.76								
I am not sure if I am able to do well in school	0.68								
My attendance is poor						0.50			
I am often late for class			0.51						
I have too many assignments		0.59							
I feel there is too much to do with tuition and school home work									0.91
I do not get enough pocket money				0.51					
I do not have enough money to pay for my basic expenses	0.64								
My parents control how much money I spend							0.80		
I have trouble getting along with family members									0.52
I have no friends/ I feel lonely				0.50					
I feel insecure because of too much competition in getting good grades and a good job								0.84	
I feel I am left with hardly any time for exercise		0.85							
I have gained/ lost weight			0.67						
I am tired and sleeping more/less than normal					0.82				
I feel sad/ depressed							0.53		
I feel nobody cares for me				0.78					
I feel have I too much pressure because of my studies and examinations			0.71						
I no longer do things once I very much liked to do					0.58				

According to the loadings of the variables, among the 9 factors for Stress level of special children in physically handicapped Children, factor1 was highly loaded on I do not understand what my teacher teaches (0.76) I am not sure if I am able to do well in school (0.68) and I do not

have enough money to pay for my basic expenses (0.64). Factor2 was highly loaded on I have too many assignments (0.59) and I feel I am left with hardly any time for exercise (0.85).

Factor3 was highly loaded on I am often late for class (0.51), I have gained/ lost weight (0.67) and I feel have I too much pressure because of my studies and examinations (0.71). Factor4 was highly loaded on I do not get enough pocket money (0.51), I have no friends/ I feel lonely (0.50) and I feel nobody cares for me (0.78).

Factor 5 was highly loaded I am tired and sleeping more/less than normal (0.82) and I no longer does things once I very much liked to do (0.58). Factor 6 was highly loaded I cannot pay attention in class (0.86) and my attendance is poor (0.50).

Factor 7 was highly loaded on my parents control how much money I spend (0.80) and I feel sad/ depressed (0.53). Factor 8 was highly loaded on I feel insecure because of too much competition in getting good grades and a good job (0.84). Factor 9 was highly loaded on I feel there is too much to do with tuition and school home work (0.91) and I have trouble getting along with family members (0.52).

CHI –SQUARE: (QUALITY OF LIFE OF THE SELECTED SPECIAL CHILDREN)

2. **To analyze the association between quality of life in hearing impaired, normal children and physically handicapped children:**

The study tried to find out the association between quality of life in hearing impaired, normal children and physically handicapped children for the following variable by using chi-square analysis.

Table-4.27

Estimated chi-square value of association between quality of life in hearing impaired, normal children and physically handicapped children

SL. No	Variables	Calculated (χ^2)value	(χ^2) 0.05	Influence
1.	Have you felt fit in doing all physical activity	87.85	43.77	Rejected null hypothesis. It is statistically Significant
2.	Have you been able to run well	62.80	43.77	Rejected null hypothesis. It is statistically Significant
3.	Has your life been enjoyable	56.92	43.77	Rejected null hypothesis. It is statistically Significant
4.	Have you felt satisfied with your life	78.21	43.77	Rejected null hypothesis. It is statistically Significant
5.	Do you cherish every moment with joy	63.48	43.77	Rejected null hypothesis. It is statistically Significant
6	Have you felt that you do everything goodly	48.56	43.77	Rejected null hypothesis. It is statistically Significant
7	Are you happy with the way you are	60.51	43.77	Rejected null hypothesis. It is statistically Significant
8	Are you always satisfied how you are and what you possess	71.01	43.77	Rejected null hypothesis. It is statistically Significant
9	Have you been able to do the things that you want to do in your free time	27.91	43.77	Accepted null hypothesis. It is not statistically Significant
10	Have you had enough time for yourself	22.20	43.77	Accepted null hypothesis. It is not statistically Significant
11	Have your parents treated you fairly	15.13	43.77	Accepted null hypothesis. It is not statistically Significant
12	Have you felt loved by your parent	22.54	43.77	Accepted null hypothesis. It is not statistically Significant
13	Have you had fun with your friends	14.85	43.77	Accepted null hypothesis. It is not statistically Significant
14	Have you and your friends helped each other	26.52	43.77	Accepted null hypothesis. It is not statistically Significant
15	Have you been satisfied with your teacher	5.40	43.77	Accepted null hypothesis. It is not statistically Significant
16	Have you been able to pay attention in school	13.59	43.77	Accepted null hypothesis. It is not statistically Significant
17	Have other girls and boys treat you nicely	19.40	43.77	Accepted null hypothesis. It is not statistically Significant
18	Do you mingle with other boys and girls	28.74	43.77	Accepted null hypothesis. It is not statistically Significant
19	Have you had enough money to do the same things as your friends	51.35	43.77	Rejected null hypothesis. It is statistically Significant
20	Have you had enough money for your expenses	16.70	43.77	Accepted null hypothesis. It is not statistically Significant

Source: calculated figures based on data compiled.

Table- 4.27 makes it evident that the association between quality of life in hearing impaired, normal children and physically handicapped children was significantly associated with the variables like have you felt fit in doing all physical activity, have you been able to run well, has your life been enjoyable, have you felt satisfied with your life, do you cherish every moment with joy, have you felt that you do everything goodly, are you happy with the way you are, are you always satisfied how you are and what you possess, have you had enough money to do the same things as your friends, since the calculated χ^2 is more than the critical values.

Hence, the null hypothesis is rejected and it is statistically significant and the association between quality of life in hearing impaired, normal children and physically handicapped children was not significantly associated with the variables like have you been able to do the things that you want to do in your free time, have you had enough time for yourself, have your parents treated you fairly, have you felt loved by your parent, have you had fun with your friends, have you and your friends helped each other, have you been satisfied with your teacher, have you been able to pay attention in school, have other girls and boys treat you nicely, do you mingle with other boys and girls, have you had enough money for your expenses, since the calculated χ^2 is less than the critical values. Hence, the null hypothesis is accepted and it is not statistically significant.

SUMMARY AND CONCLUSION

V. SUMMARY AND CONCLUSION

The study was conducted on **"Assessment of Nutritional Status, Stress Level and Quality of Life of Special Children ''.** The study was carried out in the selected special schools of Coimbatore district. A total of 180 children between the age group of 13 to 18 years were selected purposively for the study. 180 children were divided into three groups consisting of physically handicapped (girls, N=30; boys, N =30), hearing impaired children (girls=30; boys, N=30) and normal children (girls, N=30; boys, N =30).

A well-structured interview schedule was formulated and used as the tool for collecting the data on background information of socio economic, anthropometric, clinical, dietary pattern and life style of the selected special children. To find out the stress level and quality of life, an interview schedule was developed. The anthropometric measurements such as height, weight, percentiles (BMI), waist hip measurement was taken and Waist Hip Ratio (WHR) was calculated from that. A sub sample of 20 percent of the selected special children were selected to find out the nutrient intake.

The study revealed the following findings:

From the study it was revealed that the majority of the children were in the age group of 17-18 years in each group, on which 18 girls and 12 boys of physically handicapped,17 girls and 13 boys of hearing impaired and 18 girls and 8 boys of normal children.

The findings of the present study highlights that majority of the children belongs to nuclear family and only 40 children were belong to joint family.

The study reveals that out of 180 children majority of the children were living with 3-5 members and only 7 children were living with more than 8 members.

The study highlights that the majority of the children's parents had an income of rupees 7000-10,000 as their monthly income and only 4 parents had an income of less than 3000.

It was revealed that out of 180 children majority of children were in the weight range of 41-50 kg and only 16 children were in the weight range of above 60kg which shows that those children were obese.

Majority of the children were in the height of 151-160 cm whereas only 16 children were in the height range of above 170 which shows the tallest among the children.

Nineteen special children from physically handicapped, thirty-three special children from hearing impaired and twenty nine children from normal category were in the normal weight whereas 23 children from physical handicapped, thirteen from hearing impaired and twenty three from normal children were overweight. Eleven each from physically handicapped and hearing impaired, eight children from normal category were underweight .

The present study revealed that out of total special children ,58 boys and 46 girls were having the Waist Hip Ratio greater than 0.8 whereas 32 boys and 44 girls were having the Waist Hip Ratio less than 0.8.

Out of 180 special children 46 children were having muscle wasting which indicates the deficiency of protein and majority of the children i.e. 48 children were having the symptom of deficiency of Vitamin A ,21 special children show the symptom of iron deficiency and 35 children were having Vitamin C deficiency.

The present study revealed that majority of the selected special children were non vegetarian i.e. 119 children, 13 children were ova vegetarian and the remaining 48 children were vegetarian.

It was revealed that out of 150 subjects, majority of the special children i.e. 83 children had less than three meals per day, followed by 58 selected subjects who consumed three meals per day and only 39 children were having more than three meals a day.

The majority of the special children used refined sunflower oil for cooking and only few children consumed ghee and butter.

The findings shows that most of the children's family used 0.5 -1 litre of oil for preparing food whereas only a minimum percent of subjects used oil less than 0.5 litre per month.

The study reveals that the majority of the special children consumed milk, tea and coffee and only 17 children consumed health drinks.

From the study it was clear that out of 180 special children, most of them i.e. 61 girls and 57 boys consumed salt less than 5 grams whereas 29 girls and 33 boys consumed salt more than 5 grams.

From the findings, it is shown that majority of the selected subject does not have the knowledge of balance diet but only 28 subjects were having the knowledge of balance diet.

The study reveals that 53 girls and 31 boys do physical exercise regularly whereas 37 girls and 49 boys were not performing physical exercise at all because some special children were physically handicapped.

Among 180 selected subjects ,28 children from physically handicapped ,19 children from hearing impaired and 30 children from normal children shows the majority of children who performed physical activity for 30-60 minutes per day.

The study clarifies that, majority of the children including normal children slept for 4-6 hours a day and only few children slept for less than 4 hours a day.

From the study it reveals that most of the special children spent less than one hour for studying at home but 26 normal children spent more than two hour for studying at home.

The study clearly highlights that most of the children from normal category attended extra coaching hours whereas less children from physically handicapped and hearing impaired did not attend extra coaching hours.

From the study, it is clear that most of the selected special children had some or other kind of stress. Comparing the three categories of special children; hearing impaired children were having more stress level, followed by normal children and physically handicapped children were having less stress level.

In hearing impaired children the contributing factors which gives more stress level are they can't pay attention in class, feel insecure because of competition in getting good grades and good job, feel sad or depressed. Normal children also have some contributing factors to stress like they have too many assignments, not getting enough pocket money, feel insecure because of too much competition in getting good grades and good job. Regarding physically handicapped children, feeling that there is too much to do with tuition and school homework can't pay attention in class are the most factors which contribute stress to the special children.

From the study it reveals that majority of the selected special children were getting psychological and social supports from their parents as well as from their friends but certain

subjects were found to have some emotion like loneliness, sadness ,self esteem , irritable , fatigue ,anxiety etc.

CONCLUSION

Disability is a major socio-economic and public health problem in the developing countries. The number of people with disability is increasing due to population growth, ageing emergence of chronic diseases and medical advances that preserve and prolong life. Even lack of enough food or a poor balance diet, deficient in certain vitamins and minerals (Iodine, Vitamin A and Vitamin D etc.) can leave children vulnerable to certain conditions or result in physical, sensory or intellectual disabilities. It will also affect the quality of life of the children in the later stages. Hence evaluation, management and preventive care are important to prevent disability.

BIBLIOGRAPHY

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BIBILIOGRAPHY

- Adams M *et al*., (2012) .Feeding difficulties in children with cerebral palsy: low-cost caregiver training in Dhaka, Bangladesh. *Child: Care, Health and Development,* Vol 38(6) pp 878-888.
- Abdullah ,A. M., Shawkia ,S.A., Khairy S.,(2007), ‘‘Nutritional Status of Mentally Disable Children ’’,*The Egyptian Journal of Hospital Medicine* ,Vol.29:Pp 604-615.
- Bhagya B & Ramakrishna A (2013). Prevalence of mental retardation among children in Mangalore .*Nitte University Journal of Health Science* .
- Blackburn *et al.,*(2010).“Prevalence of childhood disability and the characteristics and circumstances of disabled children in the UK: secondary analysis of the Family Resources Survey ’’, *BMC Pediatrics* , 10:21.
- Black RE *et al.,* (2008) .Maternal and child under nutrition: global and regional exposures and health consequences. *The Lancet,* Vol 371 pp243-260.
- Blencowe H, Cousens S, Modell B, Lawn J. Folic acid to reduce neonatal mortality from neural tube disorders. *Int J Epidemiol* 2010; 39 Suppl 1: i110-21.
- Caulfield LE *et al*.,(2006). Stunting, wasting and micronutrient deficiency disorders. In: Jamison DT *et al*., eds. *Disease control priorities in developing countries.* Washington, Oxford University Press and World Bank, 2006:551–567.
- Census of India (2001). “The First Report on Disability”, Registrar General, New Delhi.
- Colin Mathers *et al*.,Global burden of hearing loss in the year 2000.
- David T.Derrer.MD (2013) Intellectual Disability. WebMD Medical Reference.
- De Haen, H. and Thompson, B(2003).Food Security in a World without Borders. *In* Elmadfa, I.,Anklam, E., König, J.S. 2003. *Modern Aspects of Nutrition*.2003. Karger.New York, pp. 375-380.
- Derrer D.T Intellectual Disability (Mental Retardation) Children's Health, 16 march 2013.
- Disability in the United Kingdom: Facts and Figures, July 2011. (Family Resources Survey 2009).
- Defusco ,R.A.(2011). “Simple random sampling”, Quantitative Investment Analysis,6: p-72.
- Faber, M. and Wenhold ,F(2007). Nutrition in contemporary South Africa. *Water South Africa*, 33(3):393-399.
- Food and Agriculture Organization (FAO) of the United Nations (UN).2008. *Nutrition Education for the public is essential.* Global Forum on Food Security and Nutrition Policies and Strategies (FSN Forum) Brief, issue 1.
- Goldenson, Robert, McGraw-Hill. Disability and Rehabilitation Handbook**.** New York, 2000.
- Garg S .Deafness: burden, prevention and control in India .*Nalt Med J India* 2009; 22:79-81.
- Gottlieb CA *et al* (2009) Child disability screening, nutrition and early learning in 18 countries with low and middle incomes. The Lancet, Vol 374 pp 1831-39.
- Grantham-MacGregor S, et al. (2007) Developmental potential in the first 5 years for children in developing countries." *Lancet,* Vol 369(95) pp 60-70.
- Health Guide ,The New york Times , 27 jan ,2014 .

- Henderson RC, Lark RK, Gurka MJ, et al. Bone density and metabolism in children and adolescents with moderate to severe cerebral palsy. Paediatrics 2002; 110:5.
- Hughes K,Bellis MA,Jones L.Prevalence and risk of violence against children with disabilities: a systematic review and meta-analysis of observational studies. Lancet 2012; P-1.
- Irny, S.I. and Rose, A.A. (2005) .Designing a Strategic Information Systems Planning Methodology for Malaysian Institutes of Higher Learning, 6: P-1.
- ICMR, BULLETIN .Prevention of disability in children .2007; 37:4-6.
- Jung, A.Y. National Institute for the hearing handicapped. Twenty Ninth Annual Reports. 2011.
- Katona P, Katona-Apte J (2008) .The interaction between Nutrition and Infection. *Clinical Infectious Diseases*, Vol 46 pp 1582-88.
- Khan (2009).Sampling .Research Methodology. 6: P-77.
- Kumar,S.G.,Das,A.,Bhandary,P.V.,Seans,S.J.,Harsha,H.N.,Kotian,M.S.,2008.Causes of Disabilities. *Journal of Psychiatry*.50, 21-23.
- Krause, 2008, ‘‘Assessment: Dietary and Clinical Data ’’, International Edition, P-383.
- Kothari, 2011, ‘‘Methods of data collection”, Research Methodology, 2nd edition.P-95.
- Kothari R.C.,(2004),”Research Methodology”, New Age International (P) Ltd., Publishers, New Delhi,Pp.100-113.
- Kerac M. *et al* (2012) .Impact of disability on survival from severe acute malnutrition in a developing country setting – a longitudinal cohort study. *Archives of Disease in Childhood*, Vol. 97.
- KENPRO (2010). Physical Handicaps. *KENPRO Online Papers Portal.*
- Leni chaudhuri .Disability in India; Issues and Concerns, 2006; eSS conference paper.
- Lotke , M.(1995). She won’t look at me . Annals of Internal Medicine ,123(1),Pp 54-57.
- Mohsen Maddah ,(2010) Nutritional status of the Iranian children with physical disability: a cross-sectional study, *Asia Pac J Clin Nutr* 2010;19 (2):223-230 .
- Manore MM. (2004) Nutrition and Physical activity: Fueling the active individual. President’s Council on physical fitness and sports. Research Digest, 2004; 5(1): 1-8.
- Mary S.(2010),Nutritional Interventions for Children with Special Health Care Needs .3.
- Mont (2007). Prevalence of disability in the different countries of the world. South Asia Network for Chronic Disease .
- Mont D. Measuring Disability Prevalence. Disability and Development Team. The World Bank Human Development Network Social Protection. 2007.
- Montero P (2005).Nutritional assessment and diet quality of visually impaired Spanish children. *Ann Hum Biol*, 4,498-512.
- Mayer D.(2008).Chronic Disease Prevention .Centers for Disease Control and Prevention.
- Medhi (2006). Sample Surveys .Statistical Methods (An Introductory Text).14: P-375.
- Maulik PK, Darmstadt GL (2007) Childhood Disability in Low- and Middle-Income Countries:Overview of Screening, Prevention, Services,Legislation and Epidemiology.*Pediatrics,* Vol 120.

- Noel, P.(2010) ‘‘Physical handicap”, *Social Life Journal* .
- Nayestani TR,Dadkhah –Piraghaj M , Haydari H ,Zowghi T,Nikooyeh B , Houshyar – Rad A ,Nematy M , Maddah M (2010).Nutritional status of the Iranian children with physical disability :a cross-sectional study *.Asia Pac J Clin Nutr.* 2010; 19:223e230.
- Nagati *et al.* 2003:282; Faber & Wenhold 2007:393-394). According to the WHO, World Food Programme (WFP) and UNICEF (2007).
- NNMB. National Nutrition Monitoring Bureau (2005). NNMB Reports. National Institute Of Nutrition, Hyderabad.
- National Sample Survey Organization. Disabled Persons in India: NSS 58th Round. Report No. 485. New Delhi: Ministry of Statistics and Program Implementation, Government of India, 2002.
- NSSO 58th Round, National Sample Survey Organization ,New Delhi ,2002.
- (NFI July 2009) NUTRITION FOUNDATIO OF INDIA.
- NHRC. National Human Rights Commission Manual. 2005.
- National Association of School Psychologists ,2012.
- National center for learning disabilities (2012). Stress in Children and Adolescents: Tips for Parents. *National Association of School Psychologists.*
- Oort, F. (2005). Using structural equation modeling to detect response shifts and true change. *Quality of Life Research, 14*(3), 587-598.
- Patricia A. Floyd, Sandra E. Mimms, Caroline Yelding (2007). “Personal Health: Perspectives and Lifestyles”, Page 337.
- Preety ,(2013) ‘‘ UN convention on the Rights of Persons with Disabilities ’’,Health Action .
- Periodical Health Newsletter issued by the Royal Health Awareness Society Issue 4 / July 2010.
- Peterson,G.,Mathieson ,K.(2000).Understanding parental stress : A family perspective.In P.McKenry &S.Price ,*Families under stress.what makes them resilient* ?(2nd ed.,pp.71-93).Thousand Oaks ,CA:Sage.
- Park (2013). Concept of Health and Disease. Preventive and social medicine. 22 editions. 2: P-13.
- Pelletier ,D.,Frangillo ,E.JR.Schroeder, D.G.,Habicht ,J.P.1999 . The effects of malnutrition on child mortality in developing countries. *Bulletin of World Health Organization*, 73(4):443-448.
- Paul, S. (2007). “Diet and Stress ’’.A text book of Bio-Nutrition caring diseases through Diet. Pp 426-438.
- Pai M *et al*., A pilot study of Nutritional Status of Disabled and Non-Disabled Children living in Dharavi , Mumbai. *Indian Pediatrics*. 2001; 38:60-65.
- Patel S. An Empirical Study of Causes of Disability in India. Internet Journal of Epidemiology, 2009; Volume 6 Number 2.
- Plies JR, Lethbridge-Cejku M. Summary health statistics for US adults: National Health Interview Survey, 2006. *Vital Health Stat 10*. 2007 ;(235):1-153.

- Parmar .,R.G., Vibha ,K.Vyas ., Jignesh ,H.Japaraya (2011)., ‘‘Stress and high pressure’ Stress management a hand book of knowledge improvement .,Pp 55-69.
- Ray,S (2003) .Disabled Persons in India NSS 58th round National Sample Survey Organization Ministry of Statistics and programmed Implementation.
- Rajai M , Havai N ,Kazemi R, Zadeh AZ . Nutritional Status in blind children :Isfahan Ababasir boarding school . *Journal of Research in Medical Sciences,* 2001, Vol 6, No 2 .
- Ross, S.M. (2010).Introductory Statistics, Academic Press, P-848.
- Sullivan PB, Lambert B, Rose M, Ford-Adams M, Johnson A, Griffiths P. Prevalence and severity of feeding and nutritional problems in children with neurological impairment: Oxford Feeding Study. Dev Med Child Neurol 2000; 42:674-680.
- Steinberg, A. (1991).Issues in providing metal health services to hearing impaired persons. Hospital and community Psychiatry, 42(4)380-389.
- Saravanavel (2007). Processing and analysis of data .Research Methodology.17: P-318.
- Sarva Shiksha Abhiyan. First Joint Review Mission (24 January–7 February 2005). Draft. Sarva Shiksha Abhiyan, India. 2005.
- Srivastava DK, Khan JA. Disability Needs Attention Now! *Indian Journal for the Practising Doctor*, 2008; 5: 3-4.
- Spencer, N. J.(2010). Prevalence of childhood disability and the characteristics and circumstances of disabled children in the UK: secondary analysis of the Family Resources Survey. *BMC Pediatr*. 2010; 10: 21.(bio medical center) .
- Shabayek MM.Assessment of the nutritional status of children with special needs in Alexandria. Part II: Anthropometric measures.*The Journal of Egyptian Public Health Assoc*.2004; 79:363-382.
- Sánchez-Lastres *et al* ., (2003) Nutritional status of mentally retarded children in northwest Spain: II. Biochemical indicators. *Acta Paediatrica Journal* .92(8):pp 928-934.
- Saravanavel , P(2007) “Processing and analysis of data ’’ ,Research Methodology ,2nd edition.17:p-318.
- Terry Overton, (2001) ‘‘Deafness ’’, Assessment in Special Education : An Applied Approach , 3rd edition .p-23.
- Thomas P. Mainstreaming disability in development: India Country Report. 2005.
- Tuzun EH *et al* ,.2013. Nutritional status of children with cerebral palsy in Turkey. *Disability & Rehabilitation*, Vol 35(5) pp 413-417.
- Tompsett J, Yousafzai AK, Filteau SM (2006).The nutritional status of disabled children in Nigeria: a cross- sectional survey. *Centre of International child Health* ,Institute of child Health ,London ,UK.
- Thomas P. Disability, Poverty and the Millennium Development Goals: Relevance, challenges and opportunities for DFID. 2005.
- The British Department for International Development (DFID).Poverty and Disability. World Bank Report, 2007.
- U S Census Bureau, 2010 American Community.

- United Nations (2013) Convention on the Rights of the Disability.
- UNICEF (2007). Violence against Children with disabilities: UN Secretary General's Report on Violence against Children. Thematic Group on Violence against Children with disabilities.
- Victora CG *et al* (2008) Maternal and child under nutrition: consequences for adult health and human capital. The Lancet, Vol 371 pp 340-357.
- Walker SP *et al* (2011) Inequality in early childhood: risk and protective factors for early child development. *The Lancet,* Vol 378 pp 1325-38.
- Werner D (2009) Disabled Village Children. Hesperian Foundation .
- WHO, World Bank (2011) *World Report on Disability*. Geneva: World Health Organization, p-36.
- Yeo R. Chronic Poverty and Disability. Somerset: Action on Disability and Development, Chronic Poverty Research Centre, 2001.

WIBLIOGRAPHY

- www.preservearticles.com
- www.rhas.org.jo.2010

APPENDICES

APPENDIX - 1

INTERVIEW SCHEDULE TO ELICIT SOCIO ECONOMIC PROFILE, CLINICAL, DIETARY PATTERN AND LIFESTYLE PATTERN OF THE SELECTED SPECIAL CHILDREN

A. SOCIO ECONOMIC BACKGROUND

1. Name :

2. Age :

3. Date of Birth :

4. Sex :

5. Class :

6. Type of Family : Nuclear…… Joint ……..

7. Religion : Hindu …….. Muslim……... Christian……...

8. Size of the family : <3…… 3-5…… 5-8…… >8……..

9. Total family income **: (HUDCO Classification)**

Below Rs.3000……..

Rs 3000-7000 ……..

Rs 7000 – 10,000……..

Above Rs.10,000…….

B. ANTHROPOMETRIC ASSESSMENT

10. Height in cm ……..

11. Weight in Kg ……

12. Percentile (BMI) …….

Below 5th Percentile	Underweight
5th -85th Percentile	Normal
85th -95th Percentile	Overweight
Above 95th Percentile	Obese

13. Waist Circumference (cm)…….

14. Hip Circumference (cm)……..

15 .Waist Hip Ratio (WHR)…….

Male	<0.85	>0.8

C. CLINICAL EVALUATION:

Criteria	Present	Absent
Muscle wasting in Temporal,		
Pale cornea		
Spoon shaped nails		
Unnourishedhair texture		
Adiposity		
Poor skin turger		
Angular stomatitis		
Corkscrew hairs		
Nightblindness		
Edema		
Goitre		

D. DIETARY PATTERN

16. Type of diet

Vegetarian ……. Non-vegetarian ……. Ova-vegetarian……..

17. How many meals do you consume per day?

3……. Below 3…….. Above 3…….

18. What type of oil do you consume?

Gingelly oil…….. sunflower oil…….. coconut oil …….

19. Total Quantity of Oil used per month

<0.5 litre 0.5-1 litres 1-1.5liters >2 litres

20. What type of hydrogenated fat do you consume?

Ghee…… vanaspathi…….butter…….. others ……...

21. CONSUMPTION OF FOOD (food frequency method)

Food Items	Daily	Weekly	Fortnightly	Occasionally
Cereals and Whole Grains:				
Rice				
Others				
Pulses and Legumes :				
Bengal gram				
Green gram				

Others				
Leafy vegetables:				
Cabbage				
drumstick leaves				
Others				
Roots and Tubers:				
Potato				
Onion				
Others				
Fruits:				
Apple				
Banana				
Others				
Milk &Milk Products:				
Cow's milk				
Curds				
Others				
Meat and poultry:				
Egg				
Chicken				
Fish				
Others				

22. CONSUMPTION OF JUNK FOODS

Food Items	**Daily**	**Weekly**	**Fortnightly**	**Occasionally**
Baked Items				
Chat Items				
Fried Item				
Sweets				
Pizza				
Burger				

23. Consumption of Beverages: YES…….. / NO…….

If yes……

Coffee……... Tea…… . Milk ..... .Health drinks.....

24. Consumption of Salt

<1 tsp/day >1tsp/day

25. Do you know what is a Balanced Diet?

Yes…… No…….

If yes please describe shortly

26. Describe briefly about your daily food intake (24 hour recall)

GIVE 3 DAYS' MEAL PATTERN

DAYS	**BREAKFAST (with amount)**	**LUNCH (with amount)**	**EVENING SNACK (with amount)**	**DINNER (with amount)**
DAY 1				
DAY 2				
DAY 3				

27. Problems associated with Eating

1)Do you need assistance from others to have food?

a)Yes b)No

2)Do you have anorexia/loss of appetite?

a)Yes b)No

3) Do you have any other problem which affects your food intake?

a)Yes b)No

If Yes, please specify

E. LIFE STYLE PATTERN

28. Daily exercise Yes….. No ……..

If yes <30 min/day …… 30-60 min a day …….. >1 hr a day ……...

29. Meditation Yes….. No ……..

If yes <30 min/day ……. 30-60 min a day ……. >1 hr a day ……...

30. Sleep Pattern

Sleep Duration /Day

<4 hrs…… 4-6hrs…….. 6-8 hrs…… >8 hrs……..

31. How many hours will you study at home?

<1hr/day ……. . 1-2 hrs a day …… >2 hr a day ……

32. Are you going to Tuition? Yes……. No ……..

If yes

<1hr/day 1-2 hrs a day >2 hr a day

APPENDIX-2

INTERVIEW SCHEDULE TO ANALYZE THE STRESS LEVEL OF

SPECIAL CHILDREN

Never: 0
Rarely: 1
Sometimes: 2
Often: 3
Very Often: 4(Scores)

Questions	Never	Rarely	Sometimes	Often	Very Often
1. I cannot pay attention in class.					
2. I do not understand what my teacher teaches .					
3.I am not sure if I am able to do well in school.					
4. My attendance is poor.					
5. I am often late for class					
6. I have too many assignments					
7. I feel there is too much to do with tuition and school home work.					
8. I do not get enough pocket money.					
9. I do not have enough money.					
10. My parents control how much money I spend.					
11. I have trouble getting along with family members.					
12. I have no friends/ I feel lonely.					
13. I feel insecure because of too much competition in getting good grades and a good job.					
14. I feel I am left with hardly any time for exercise.					
15. I have gained/lost weight.					
16. I am tired and sleeping more/less than normal.					
17. I feel sad/ depressed.					
18. I feel nobody cares for me.					
19. I feel have I too much pressure.					
20.I no longer do things once I very much liked to do.					

Interpretation of Scores:

0 – 20 : Good control over stress

21 – 40 : Low level of stress

41 – 60 : Medium level of stress: Should reconsider means of coping with stress

61 – 80 : High level of Stress: Needs Counselling

Source: Ministry of Social Security, National Solidarity & Reform Institutions

APPENDIX -3

INTERVIEW SCHEDULE TO ANALYSE THE QUALITY OF LIFE OF SPECIAL CHILDREN

Q1. Have you felt fit in doing all physical activity?

a) never b) rarely c) sometimes d)often e) always

Q2 .Have you been able to run well?

a) never b) rarely c)sometimes d)often e)always

Q3. Has your life been enjoyable ?

a) never b)rarely c)sometimes d)often e)always

Q4. Have you felt satisfied with your life ?

a) never b) rarely c) sometimes d) often e) always

Q5. Do you cherish every moment with joy ?

a) never b) rarely c)sometimes d) often e)always

Q6. Have you felt that you do everything goodly?

a) never b) rarely c) sometimes d) often e) always

Q7. Are you happy with the way you are ?

a) never b) rarely c) sometimes d) often e) always

Q8. Are you always satisfied how you are and what you possess?

a) never b) rarely c) sometimes d) often e) always

Q9. Have you been able to do the things that you want to do in your free time ?

a) Never b) rarely c)sometimes d) often e) always

Q10. Have you had enough time for yourself ?

a) Never b) rarely c) sometimes d) often e) always

Q11. Have your parents treated you fairly ?

a) Never b) rarely c) sometimes d) often e) always

Q12. Have you felt loved by your parent ?

a)Never b) rarely c) sometimes d) often e) always

Q13. Have you had fun with your friends ?

a) Never b) rarely c)sometimes d) often e)always

Q14. Have you and your friends helped each other ?

a) Never b) rarely c) sometimes d) often e) always

Q15. Have you been satisfied with your teacher ?

a) Never b) rarely c) sometimes d) often e) always

Q16. Have you been able to pay attention in school ?

a) Never b) rarely c) sometimes d) often e) always

Q17. Have other girls and boys treat you nicely ?

a) Never b) rarely c) sometimes d) often e) always

Q18. Do you mingle with other boys and girls?

a) Never b) rarely c) sometimes d) often e) always

Q19. Have you had enough money to do the same things as your friends?

a) Never b) rarely c) sometimes d) often e) always

Q20. Have you had enough money for your expenses?

a) Never b) rarely c) sometimes d) often e) always

APPENDIX –4

PARENTS CONSENT FORM

"Assessing nutritional status, stress level and quality of life of special children."

If you are uncomfortable in answering any of our questions during the course of the interview you **have the right to withdraw from the interview / study at anytime.** You have the freedom to withdraw from the study at any point of time. Kindly be assured that your refusal to participate or withdrawal at any stage, if you so decide, will not result in any form of compromise or discrimination in the services offered. You will continue to have access to the regular services offered to a patient. You will **NOT** be paid any remuneration for the time you spend with us for this interview / study. The information provided by you will be kept in strict confidence. Under no circumstances shall we reveal the identity of the respondent or their families to anyone. The information that we collect shall be used for approved research purposes only. You will be informed about any significant new findings – including adverse events, if any, - whether directly or indirectly related to you or to other participants of this study, developed during the course of this research which may relate to your willingness to continue participation

Consent: The above information regarding the study, has been read by me/ read to me, and has been explained to me by the investigator/s. Having understood the same, I hereby give my consent to them to interview me. I am affixing my signature / left thumb impression to indicate my consent and willingness to participate in this study (i.e., willingly abide by the project requirements)

Signature / Left thumb impression of the Study Volunteer / Legal Representative:

Signature of the Interviewer with date Witness:

APPENDIX -5

INSTITUTIONAL HUMAN ETHICS COMMITTEE

Avinashilingam
Institute for Home Science and Higher Education for Women
University
(Estd. u/s 3 of UGC Act 1956)

14th February 2014

To
Ms. Salam Laxmi
Department of Food Service Management and Dietetics
Avinashilingam Institute for Home Science and
Higher Education for Women
Coimbatore – 641 043

Dear Madam,

Ref : Our letter dt. 8th February 2014 in response to your proposal No. AUW.IHEC.2013:49 entitled "Assessment of nutritional status, stress level and quality of life of special children"

In continuation with the revisions made by you in your proposal as per the suggestions made by the IHEC, the Institutional Human Ethics Committee of our University hereby grants approval to your research proposal No.AUW.IHEC.2013:49 entitled "Assessment of nutritional status, stress level and quality of life of special children". The Approval number for the same is AUW/IHEC-13-14/FHP-13.

We wish you all the best in your research endeavours.

Regards,

14/2/14

Dr.P.R.Padma
Member Secretary

Institutional Human Ethics Committee