Chapter II

REVIEW OF RELATED LITERATURE

A careful study and sincere efforts have been made by the research scholar to locate the related literature for the present study. It was essential to have insight into work already done in this field. The research scholar has gone through all the literature available in the library of Lakshmibai National University of Physical Education, Gwalior, Library of Post Graduate Govt. Institute for Physical Education Banipur, Library of Visva Bharati, library of Chatra Ramai Pandit Mahavidyalaya and different websites. In our country very less research works have been done as compared to other country in the field of disability. Brief reviews of related studies in the field of Blind, Deaf and Dumb children and their Physical Performance Capacity are given as under:

V. Mishra and A. Singh (2012) took up a study where they compared the Self-Concept and Self-Confidence of the Sighted Children and the Visually Impaired Children. The descriptive survey method of research was followed in the present study. Total sample of 200 students which consisted 100 sighted and 100 Visually-Impaired children studying in the different schools of Delhi were selected for the study. Self-Concept Inventory which was constructed and

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standardized by Mohsin (1979) was used to measure the Self-Concept. The Self-Concept Inventory had a total of 48 items. Self-Confidence Inventory which was constructed and standardized by Pandey (1983) was used to measure the Self-Confidence. It had a total of 60 items. The findings of the study were as follows:

i) By and large Visually Impaired students were found to have low self-concept. 59 percent Visually Impaired students had poor Self-Concept and 4 percent students were found to have very high Self-Confidence.

ii) It was found that sighted students had higher Self-Concept as compared to Visually Impaired students. 73 percent subjects in the study scored between 29 and 38 reflecting average Self-Concept. 18 respondents out of 100 scored below 28, which indicated a very poor Self Concept. 9 subjects in the study held a very high Self-Concept.

iii) On the variable of Self-Confidence, Visually Impaired students were found to have average Self-Confidence. 64% respondents had average to high Self Confidence, 35 respondents had very low Self-Confidence.

iv) It was found that sighted students had higher Self-Confidence as compared to Visually Impaired students. There were 74 subjects who had average to high Self Confidence, 11 subjects had shown a very high Self-Confidence. There were only 15 subjects who had low Self-Confidence.

v) On the variable of Self-Concept, it was found that there was a significant difference in Self-Concept of Visually Impaired and non-challenged students.
The mean score of Self-Concept of sighted children (31.86) was higher than Visually Impaired children (27.35).

vi) On the variable of Self-Confidence, it was found that there was a significant difference in the Self-Confidence of Visually Impaired and non-challenged students. The mean score of Self-Confidence of sighted children (28.66) was higher than Visually Impaired children (24.34).

vii) There had been no significant difference of Self-Concept and Self Confidence of males and females. The results showed that the ‘t-ratio’ between two groups were not significant at any acceptable level of significant i.e. .01 and .05.

Kasomo Daniel (2012)² conducted a Psychological Assessment of Visual Impaired Children in integrated and special schools. In Kenya there was a provision for Visual Impairment Children to include them in the integrated school. Very few researches had been done regarding the benefit of integrated program on Visual Impaired Children. The researcher used the ex-post-facto design to compare the Self-Concept of 20 blind children in classes 5 to 7 who had been placed in integrated (N = 10) and special (N = 10) schools. Self-Concept was measured with a Self-Concept scale developed by the researchers based on existing Self-Concept scales especially the Piers-Harris Children’s

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Self-Concept Scale and the Tennessee Self-Concept Scale. Pupil to pupil and teacher to pupil interaction were also examined as other variables. The data were analyzed using the two-tailed ‘t’ test. The Blind pupils in integrated schools had a significantly higher (t = 2.08, p<.05) Self-Concept than their counterparts in special schools. The level of pupil to pupil interaction for the blind pupils in integrated schools was significantly higher (t = 2.97, p<.01) than that of pupils in special schools. From this finding, it was concluded that the integrated school offers a social environment favorable for the development of a positive Self-Concept.

Kavita Choudhary (2012) carried out a study to find out the attitude and behavior of normal students as well as physically disabled student and compared both variables between physically disabled and normal students. The study was conducted on 200 students from special school and from general schools. In which 100 physically disabled students and 100 normal students were selected in the study. Self made questionnaire and picture frustration test were used as tools for data collection. The study was essentially a descriptive exploratory research. The findings revealed that education was very useful for them and physically disabled children experience discomfort in interactions with the normal children. It was concluded that disabled individuals had limited

social relationship due to their functional impairments and also to limited and constrained interpersonal interactions available to them. It was further implied that by virtue of these limitations, the disabled possess less social competence than their non disabled counterparts.

Ashta Rautela (2011)\textsuperscript{4} compared the effect of yoga-mental rehearsal and adapted physical education program on psychological variables of differently abled children. 90 differently abled children were selected as subjects for this study and classified into three groups of amputation, poliometrics and congenital deformity with 30 children in each group. These children were from all India Pingalwara Charitable Society, Amritsar. The following Psychological variables were chosen for the study: Self-Concept, Trait-Anxiety, Social-Adjustment, Stress and Aggression. ANCOVA were adapted as statistical procedure and Post-Hoc test applied when needed to find out the difference between the adjusted final means. On the basis of the findings of the study, it might be concluded that-

i. Yoga asana, pranayam and mental rehearsal techniques significantly improved a wide range of Psychological conditions, including Self-Concept, Trait- Anxiety, Social Adjustment, Stress and Aggression. Yoga also proved

effective in reducing Trait- Anxiety and Aggression was as effective in increasing the Self-Concept.

ii. Yogic asana and pranayam with different series of asanas helped them in adjustment, understanding the peer groups and helpfulness.

iii. Adapted Physical Education Program significantly improved Psychological variables, including Self-Concept, Trait- Anxiety, Social Adjustment, Stress and Aggression. Adapted Physical Education also proved effective in reducing Stress and effective in improvement of Social Adjustment.

iv. Adapted Physical Education Program was highly effective in sustaining an ensuring active participation among all the groups.

v. The recreational based Adapted Physical Education Program containing aerobics, dance and minor & modified games, outdoor activities, swimming was highly effective for the differently abled children.

vi. While administering the two experimental groups the element of competitiveness, sense of achievement and amusement and over-coming of difficulties were ensured.

I. Akram and M. A. Naseem (2010)\(^5\) investigated a study ‘Self Concept and Social Adjustment among Physically Handicapped Persons’. The objective of the study was to find out the level of Self-Concept and Social Adjustment of

handicapped persons living in Lahore city. To collect data face-to-face survey method technique was adopted due to the sensitivity of the topic. The questionnaire was prepared beforehand for this purpose. English and Urdu language were used interviewing medium. Since the target population was handicapped persons related to either some rehabilitation center or not, so a lot of them were unable to understand English that’s why interviewer had to translate the questions in Urdu and sometimes in Punjabi. Also simple and easy terminology was used in the questionnaire. The final draft of the questionnaire consisted of 3 sections and 30 questions. 1st section was used to collect personal information. 2nd Section was specified to measure the Self-Concept and 3rd section was specified to collect information about the Social Adjustment. In the result they found Self Concept and social adjustments were positively associated with age, gender, occupation and education. The result showed the rejection of null hypothesis that rehabilitation centers playing their positive role in developing Self Concept and Social adjustment among physically handicapped persons. The correlation co-efficient between self concept and social adjustment was 0.76 which indicates a strong positive correlation. The study was concluded that, since 70% of respondents were from stratum 1 that contained the handicapped persons related to some rehabilitation center had a high level of self concept, whereas 2nd stratum had a low level of Self-Concept. But as a whole of the sample results showed that social adjustment depended upon the Self- Concept, as high self concept result the high social adjustment of
the individual and similarly as low self-concept, low would be the social adjustment of the handicapped. It was further indicated that self-concept depends upon age, gender, and occupation and education level.

Vikas Bhardwaj (2010)\(^6\) administrated a study which was confined to all personality factors and self concept areas on selected nature and degree of disabilities classified into blind, partially blind, deaf, hard of hearing, upper and lower extremity affected orthopedically disabled male children in the age group of 12-15 years. The total of 300 subjects (50 in each group) were selected for the study randomly. The subjects belonged to different socioeconomic status from the state of Punjab, Haryana, Delhi, M.P. and Chandigarh. They all were studying at different schools and rehabilitation centers. To test personality factors of all selected categories of disability (HSPQ) High School Personality Questionnaire (14 P.F) were used and converted in Hindi version. The data was collected by administering these tests in the classroom. The special teachers of blind and deaf children were approached for help to establish coordination between the subjects and the researcher. The tests were also typed in Brail for blind subjects with special answer sheets and stencil in Brail were made to help them easily prick the answer. One way analysis of variance (ANOVA) was used

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for testing the hypothesis. The level of significance was set at 0.05 level of confidence. Further, where ever ‘F’ value was found significant, it was subjected to the post-hoc test to find out the significant difference between the adjusted final means. The groups were compared on each personality factor and Self Concept area among selected categories of disability. The result indicated that there were significant difference in personality factor and Self Concept areas among Blind, partially Blind, Deaf, hard of hearing, upper and lower extremity affected orthopedically disabled children except for the Self-Concept Area-I, ‘behavior’ where no significant difference appeared. Results further showed in case of hearing impaired children, hard of hearing and deaf children to be outgoing with level of intelligence, emotional stability, assertiveness and independence were higher in hard of hearing subjects. Both the groups were obedient and sober in nature. The findings on Self-Concept showed them to have uniform behavior, least popular and hard of hearing children more bothered about their physical appearance, had higher anxiety level than blind and on an average spent their life in happiness.

Rakesh Pathak (2008) conducted a study to determine an effect of graded exercise on selected physiological variables of Deaf Dumb children of 14 to 20 years of age. Fifty male children from Jyoti Badhir Vidyalaya, Bithoor, Kanpur were selected randomly as subject. Among them 40 subjects were taken

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as experimental group and 10 subjects as controlled group. Following physiological variables were selected i.e. Resting Heart Rate, Vital Capacity, Haemoglobin Percentage, Triceps girth, Suprailliac girth, Subscapular girth, Abdominal Umbilicus Girth, Positive and Negative Breath Holding Capacity and Cardio Respiratory Endurance. At the same time following graded exercises were taken i.e. Jumping Jacks (Two Count and Four Count), Alternate Toe Touching, Sideways Lunging, Steps Ups(30 Seconds), Shuttle Run (10X4), 50 Mt Run, Bent Knee Sit Ups(15X3), Forward Lunging, Trunk Rotation, Sideways Bending and Twisting (Upper Body Both Side), Shoulder Rotation, Forward and Backward Bending, Hala Asana and Bhujanga Asana. For the result ‘t’ test and ‘z’ test were applied to find out the mean difference between pre and post test and comparison of mean difference between the two groups respectively at 0.05 level of significance. The results showed adaptive changes were observed in Resting Heart Rate, Vital Capacity, Haemoglobin Percentage, Positive and Negative Breath Holding Capacity and Cardio Respiratory Endurance and Body Composition after twelve weeks graded exercises programme.

A. Zebrowska, K. Gawlik, A. Zwierzchowska (2007)\textsuperscript{8} investigated whether a sensory impairment had an effect on functional capabilities of the

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respiratory system and whether possible deviations from reference ranges of selected parameters might indicate a decrease of physical efficiency. Vital capacity (VC), forced vital capacity (FVC), forced expiratory volume in 1 second (FEV1), peak expiratory flow (PEF), forced expiratory flow of 25-75% (FEF25-75), maximum voluntary volume (MVV), and maximum oxygen uptake VO$_2$ max were measured in 86 deaf and 102 blind children and adolescents, and in a matched group of hearing controls. Result showed a significant influence of deafness on PEF (P<0.01), FEF25-75 (P<0.05), and MVV (P<0.05). As compared with the control subjects, mean VC was significantly lower in blind adolescents (P<0.05). In conclusion the results suggested that both sensory defects during childhood and adolescence affect functional capabilities of the respiratory system.

Krystyna Gawlik and Anna Zwierzchowska(2006)$^9$ took up a study which had the objective to compare of chosen strength abilities in Deaf and Blind adolescents. In this comparative study Blind, Deaf and normal adolescents aged 16-17 yrs were tested. The following types of strength abilities were evaluated; Explosive Strength, Static Strength, and Relative Strength. All tests were conducted according to the Eurofit test instruction. The results achieved by Deaf boys might suggest better development of strength abilities in comparison with Blind boys. This tendency did not occur with girls. In the

majority of the tests their results were worse in comparison with blind girls. The hypothesis was confirmed with boys (apart from trunk strength). Among girls, worse results were achieved by Deaf girls (apart from lower limb explosive strength). In conclusion the obtained results did not confirm the tested hypothesis that the level of motor abilities was lowest in Blind adolescents.

A. Zebrowska, A. Zwierzchowska (2006)\textsuperscript{10} investigated a study which was carried out to estimate the values of spirometric variables in Deaf children and Deaf adolescents and compared them with those in their hearing counterparts. Both Deaf (D) and Hearing (H) subjects were divided into 3 age groups ranging 10-11, 12-13, and 16-17 years. All subjects presented a normal intellectual level with no chronic disorders or other respiratory problems during the preceding 2 weeks. All of them were recruited from students attending special schools for Deaf children in the cities of Katowice, Kraków, and Racibórz in Poland. All deaf children were characterized by loss of hearing above 80 dB. In the group, 46% of children had acquired hearing loss (e.g., from meningitis before the age of 2 yr), 22% had heredity hearing loss, 16% had congenital, and in 16% the cause of deafness was unknown. The experimental procedures were explained to each deaf child by both sign language and in writing. Standard spirometry (PonyGraphic 3.7, Cosmed, Italy) was used to analyze: Vital Capacity (VC), Forced Expiratory volume in 1 s (FEV1), Peak

Expiratory Flow (PEF), mean Forced Expiratory Flow (FEV25-75), Maximal Flow Volume Curve (MEF75, MEF50, MEF25), and Maximal Voluntary Volume in 10 s (MVV). The measurements were carried out one after another always in the morning. For the determination of Physical Efficiency, Astrand - Ryhming test was performed on a cycle ergometer. The exercise consisted of 5 min cycling period. Both spirometry and exercise tests were performed at school. The result showed an age-dependent significant increase in VO2max in both Deaf and Hearing children (F=3.93, P<0.05). This increase in Deaf children, in some cases, lagged behind that present in hearing children. Furthermore, we found a significant influence of deafness on PEF (F=5.83, P<0.02) and MVV (F=9.3, P<0.01), but no effect was seen with respect to VC. The Deaf girls, across all age groups studied, had significant lower values of PEF (P<0.05) and MVV (P<0.01) compared with the Hearing girls. Similar differences, with the exception of PEF in the youngest 10-11 years old, also were noted in boys. VC showed a tendency to decrease in either sex and at all ages, but the decrease failed to assume statistical significance. In conclusion, the data demonstrated that sensory deprivation of Deaf children aged 10 to 16 years affects functional capabilities of the Respiratory System. Therefore, it was necessary to encourage Deaf children to participate in auditory rehabilitation programs and systematic Physical Exercises.
S. Nadir, S. Akhtar and M. Ali (2006) 11 carried out a study to assess the needs of Deaf and Dumb children of teenage and how these needs must be satisfied that these children would be well adjusted in society. A well-designed interview schedule was used as the tool of the study. The number of male (170) children was slightly higher than female children in hearing impaired children school. A sample of 120 respondents was selected from the two Government Higher Secondary Schools of Special Education located at Peoples Colony and Jaranwala Road, Faisalabad. Majority of the children i.e. 80% were Deaf and Dumb by birth. Sixty percent of the disabled children belonged to age category 17-19 years. It was found that 63.3 percent of the respondents had incidence of disability in their families. Most of the respondents (47.5 percent) had very close relation with disable relatives. The school had provided hearing aid to 100% children but had not provided any training workshop for the identifications of sounds. So 58.3% children reported that hearing aid created tension for them. Majority of the respondents (45 percent) reported that they did not like to make friendship with normal children due to communication problems. Only 10.8% of respondents received preference over other siblings by their parents. While fifteen percent were not at all satisfied by the attitude of their siblings. So 59.2 percent children felt uneasiness and shyness in meeting strangers and did not feel themselves well adjusted in society. The children who

received proper attention by their parents and teachers were well adjusted in the society, as they did not hesitate and felt shyness in meeting strangers. On the other hand those children who did not receive proper attention by their parents and teachers created the problem of maladjustment in society.

T. Colak, et al., (2004)\textsuperscript{12} took up a study where the purpose of the study was to verify the effect of playing goalball on some measures of motor fitness. One hundred and three children (age 13–15 years) with varying degrees of blindness were assessed for motor fitness. All participants were male. The participants underwent motor fitness (Balance, Handgrip, Flexibility, Vertical Jump, Isokinetic Concentric (Peak Torque) assessments. There were significant differences between goalball players and non-goalball players regarding many motor fitness components. Non-goalball players were inferior in all motor fitness compared with goalball players. Significant differences were noted in result in favour of the goalball players when the balance assessment test was evaluated statistically (P < 0.05). The goalball groups had higher Grip Strength than control groups. Scores for Vertical Jump were significantly different between goalball players and non-goalball players. The goalball players attained better results in Vertical Jump (P < 0.05). Mean values were significantly higher for goalball players than non-goalball players at the Sit and Reach test (P <

This study suggested that goalball might be considered effective option to improve motor skills in Visually Impaired Children.

Eugeniusz Bolach (1999) evaluated the effectiveness of sports team games in the process of fitness improvement of the Blind people and the Visually Impaired. The research was carried out in two stages. In the first stage (sounder) the sample contained the 138 Visually Handicapped men and was divided into two subgroups: the sports group (comprising 30 blind individuals and 35 with the dimness of vision) and the control one (35 of the blind and 38 with the dimness of vision). Individuals from sport subgroup were members of sportive club "Start Wroclaw", while the ones from the control subgroup had no contact with sports team games at all. The second stage of investigation (experiment) involved 31 sportsmen (11 of the blind and 20 with dimness of vision) from the club mentioned above and 30 men (10 of the blind and 20 with dimness of vision) taken as a control subgroup. The samples analyzed in the first and second stages of investigation did not differ from the statistical point of view, i.e. they might be considered as representing the same populations relatively. The methods of measurements and evaluation were as follows:

- For the evaluation of the General Physical Fitness - the well known "Eurofit" test was used.

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• For the evaluation of the special Physical Ability - original tests was designed by Bolach.

• For the estimation of the Social Contacts - the 3rd scale of Questionnaire of Emotional Factors was used.

• To describe of the Body Posture - the photogrammetric computer set was employed by using on the phenomenon of "projection mora".

The results were then elaborated statistically. In the sounder stage of investigation the significant supremacy of sports groups were established according to all traits under study. The mean level of motor ability of the individuals with dimness of vision was higher in comparison with the Blind ones. It was surely connected with the possibility of making use with the rest of sight in the first. The longitudinal study carried out in the second stage of investigation made possible to describe the dynamics of the observed changes. It was found that even after a relatively short time period between consecutive measurements the improvement of Physical Abilities in sport groups occurred which was statistically significant, while in control groups the respective changes were not observed. In conclusion it might be stated that-

• The practicing of sports team games by the blind or persons with dimness of vision raised the level of General Physical Fitness, and this level in the Blind sportsmen was comparable with one observed in population of people with only dimness of vision.
• The original tests of the Special Physical Ability, occured to be reliable, and their validity was proved by high correlation with the level of Social Adaptation estimated with help of the 3rd scale of Questionnaire of Emotional Factors.

• The improving role of sport games, by stimulation of the compensation process of vision shortage, was very distinct and may be observed even after a relatively short time of practicing the games.

• The most clear effect of improving was found according to the abilities of spatial orientation, being one of the most important elements of compensation of vision of the Blind and persons with dimness vision.

• A distinct improvement of ability of the Visually Handicapped persons was observed in localization of the source of sound by the sense of hearing or the sense of touch. An improvement of precision as well as time of such localization played important role in everyday activity of Visually Handicapped.

• The practicing of sports team games influenced the body posture, especially in respect to Scoliosis, which was very common for the Blind and persons with visual dimness. However, the sport games did not influence the spinal curvatures in the sagital plane, which were fixed by the form of movement characteristic for Visually Handicapped Persons.
• The practicing of the sports team games constituted a very important
element in the rehabilitation process of the Blind and of the persons with
visual dimness.

Manjunath N. K., et al.,(1998) formed the present study on the basis
of the result of their previous study. In this study they showed the Blind subjects
had received a rehabilitation program from the age of 4 years onwards, which
might have influenced auditory function. Hence the present study was designed
to compare the AEP MLRs of normal sighted subjects with age-matched Blind
subjects who had not undergone early rehabilitation. Auditory evoked potentials
(0 to 100 ms. range) were recorded in 10 congenitally blind subjects (average
age = 22.4 +/- 4.9 yrs.) and an equal number of age-matched subjects with
normal vision. There were two repetitions per subject. The peak latencies of
both the Pa (maximum positive peak between Na and 35 ms.) and Nb
(maximum negative peak between 38 and 52 ms.) waves were significantly
shorter in congenitally Blind compared to normal sighted subjects. Since the Pa
and Nb waves were believed to be generated by the superior temporal cortex
(Heschl's gyrus), it appeared that processing at this neural level occurs more
efficiently in the Blind. In the present study smaller amplitudes of Pa and Nb
waves of AEP-MLRs were recorded over Oz compared to Cz, in the

components of middle latency auditory evoked potentials in congenitally blind compared to normal sighted
subjects” The international journal of neuroscience, 95(3-4), (September 1998), pp.173-181, source:
congenitally Blind and normal sighted subjects. Hence there was no evidence of the occipital cortices contributing to cortically generated AEP-MLRs in the Blind.

The results hence suggested that irrespective of early rehabilitation programs, there was facilitation of processing of auditory information at the level of the primary auditory cortex. However, the occipital area did not play a role in auditory information processing at primary cortical areas, in the congenitally blind. Also, in spite of the absence of an early rehabilitation program the present subjects showed the same auditory changes as those reported earlier.

R. Singh and H.J. Singh (1993) 15 carried out a study where they established Anthropometric and Physiological profiles of active Blind Malaysian males Cardiopulmonary Capacities of twelve adults (aged between 14 to 44 years) with varying degrees of Blindness engaged in regular recreational activities were compared with twelve age-matched normal sighted healthy males (control group) who were also involved in regular recreational activities. Maximum Oxygen Consumption (VO$_2$max) was measured directly during exhaustive exercise test on a cycle ergometer. Forced Vital Capacity, Leg Strength and Power were determined by spirometry, Standing Long Jump and Vertical Jump respectively. No significant differences in VO$_2$max, Forced

Vital Capacity and Leg Strength and Power were observed between the Blind and the control groups. No anthropometric differences were evident between the two groups. The results showed therefore that the visually handicapped who were active could have a similar level of Physical Fitness, Lung Function and Explosive Leg Strength as those of their active sighted counterparts.

W.G. Hopkins, et al., (1987) conducted a study where they compared Physical Fitness of Blind and sighted children. Twenty-seven children (age 7-17 years) with varying degrees of blindness but with no other known disorder were assessed for physical fitness. Twenty-seven randomly selected children with normal eyesight were also assessed. Maximum Oxygen Uptake (VO$_{2 \text{max}}$) was measured directly during a progressive exercise test on a treadmill. There was a significant and substantial reduction in VO$_{2 \text{max}}$ in totally Blind children (mean +/- standard deviation 35.0 +/- 7.5 ml X min-1 X kg-1) compared with normal children (45.9 +/- 6.6 ml X min-1 X kg-1). Partially sighted children had a significant but smaller reduction in VO$_{2 \text{max}}$. Fitness assessed by a step-test was significantly reduced in the Visually Impaired Children, and skin-fold thickness was also significantly greater in totally Blind children. The level of habitual physical activity for each child, as assessed by a questionnaire, correlated with VO$_{2 \text{max}}$ (r = 0.53, p less than 0.0001). Blind children were significantly less active than normal children, and the difference between mean VO$_{2 \text{max}}$ for blind

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and normal children became non-significant when their different activity levels were taken into account. It was concluded that totally Blind children were less fit than other children at least partly because of their lower level of habitual activity.

Butterfield’s (1985) investigation was designed to compare and analyze the fundamental motor and balance skill of hearing impaired children through utilization of criterion reference assessment tool. This investigation attempted to ascertain qualitative differences with the population in the skills of walking, running, jumping, throwing, hopping, skipping, climbing up and balancing. In addition, the investigation attempted to determine if qualitative difference in skill performance were related to age and sex degree of hearing loss in decibel and axiology of hearing loss of children. 132 hearing impaired children between the age of 3 and 14 were selected from Ohio State University. Scale of Inter-Gross Motor Assessment was used to gather on the children gross motor performance while selected items from Brunininks Oseretsky Test of Motor Proficiency was utilized to obtain information relative to the subject’s static and dynamic balance capabilities. The children were individually assessed by the principal investigator at their respective schools. In performing an assessment, the evaluation permitted three trials for each Gross Motor Skill and two trials for each Balance Tasks. Explicit direction and skill demonstration

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were given prior to the execution of each skill. Scoring was based on careful observation of child’s motor behavior in performing a skill with companion of that performance which the criterion outlined in the respective test materials. Following conclusions were obtained. In terms of the fundamental motor skill, both the balance task and advanced chronological age, resulted in improved performance and the other skill, walking did not appear to depend on age, at least within the age range investigated in this study.

S. Sundberg (1983) conducted a study to find out the Lung volume and Exercise Ventilation in Blind and normal boys and girls. Lung volume at rest and ventilation during maximal exercise on a bicycle ergometer were measured in 180 children. The material comprised 12 Blind boys and 11 Blind girls (8-14 years) as well as 82 normal boys and 75 normal girls (8-17 years). As a result of the study Forced Vital Capacity (FVC) per height did not differ significantly between Blind and normal children of either sex. Where forced expiratory volume in one second (FEV1.0) as a percentage of FVC was very similar in all four groups. Maximal Expiratory Volume (VE max) was significantly (p < 0.01) higher in normal than in blind children of both sexes. Tidal Volume during maximal work (VT max) as a percentage of FVC (VT max/ FVC %) was not age dependent and showed no sex differences. It was significantly (p < 0.001) higher in normal than in blind children of both sexes. In conclusion, it

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seemed as if a low level of habitual physical activity did not influence Lung Volume (FVC), while the bellows function of the lungs during Maximal Work (VE max, VT max/FVC%) was inferior in Blind, sedentary children.

S. Sundberg (1982)'s study investigated another study where he aimed to find out Maximal Oxygen Uptake in relation to age in Blind and normal boys and girls. Maximal Oxygen Uptake (VO$_2$ max) was measured in 180 children during exhaustive work on a bicycle ergometer. The material comprised 12 Blind boys and 11 Blind girls (8-14 years) as well as 82 normal boys and 75 normal girls (8-17 years). VO$_2$ max increased linearly with age in all four groups. Results showed that in normal girls mature values were reached at the age of 14 years. Normal boys had significantly higher values than normal girls and their VO$_2$ max increased faster with age. No sex differences in VO$_2$ max were found in Blind children. Normal children had significantly higher values than the Blind. VO$_2$ max/kg was uninfluenced by age in three of the groups: 55, 45 and 37 ml/min/kg in normal boys, Blind boys and Blind girls, respectively. In normal girls VO$_2$ max/kg decreased with age from 51 to 42 ml/min/kg. Significant sex differences were found in both normal and blind children. VO2 max/kg in blind boys was 82% of that of normal boys, while blind girls had significantly lower values than normal girls. Most of these differences were established already at the age of 8 years. It was concluded that the differences in

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Maximal Oxygen Uptake between normal and Blind children were to a high degree due to different levels of physical activity during early childhood.

Minter (1970)\textsuperscript{20} compared Deaf and hearing freshmen male college student on the variables of Reaction Time and Movement Time. Forty Deaf male freshmen at Gellandet College Washington D.C. and 50 hearing male freshmen at Catholic University, Washington D.C. who were enrolled in the required Physical Education program, were tested on two tasks. The first was a simple Reaction Time test requiring subjects to depress a telegraph key with the index finger when a visual stimulus appeared. The second was the complex reaction and movement task requiring the subjects to extinguish 10 lights in random sequence. Each subjects had 10 trials on each of the two tests. Results of the simple reaction time test showed no significant difference on the Reaction Movement time, however deaf were found superior.

D. Vancampfort, et al.,(2012)\textsuperscript{21} investigated the reproducibility of the Eurofit Physical Fitness test battery in patients with schizophrenia or schizoaffective disorder. Secondary aims were to assess clinical and demographic characteristics that correlate with the performance on the Eurofit and evaluation of the feasibility of the test. Fifty patients with schizophrenia or schizoaffective disorder (mean age of 32.9±9.5 years) with a mean Body Mass

Index (BMI) of 26.1±6.0kg/m² performed two Eurofit tests administered within 3 days. All Eurofit items showed good reproducibility with intra-class correlation coefficients ranging from 0.72 for Flamingo Balance to 0.98 for Standing Broad Jump Test. All participants could perform five of the seven test items without problems. The whole body balance and abdominal muscle endurance test could be executed by 74 and 90%, respectively. Significant correlations were found with age, BMI, waist circumference, dose of antipsychotic medication and extra pyramidal, negative and cognitive symptoms. The Eurofit test showed good reproducibility and can be recommended for evaluating Physical Fitness parameters in patients with schizophrenia or schizoaffective disorder. Physical Fitness measures were related to both physical and mental health parameters.

A. Carraro, S. Scarpa and L. Ventura (2010) examined a relationship between physical Self-Concept and Physical Fitness in Italian adolescents. Physical Self-Concept exerts a central role in adolescence. The purpose of this study was to examine the relationships between physical Self-Concept and actual indicators of Physical Fitness among youth in early adolescence. A total of 103 Italian boys and girls, ages 12 to 15 years (M = 13.2, SD = 0.7) were studied. Physical Self-Concept was assessed by using the Physical Self-Description Questionnaire, EUROFIT tests were used to measure

Physical Fitness and BMI was calculated based on height and weight measurements. Results showed several significant correlations between the variables, revealed some sex differences on physical Self-Concept and fitness, and indicated significant correlations between EUROFIT scores and physical Self-Concept variables.

Annette Keane et al., (2010) carried out a fitness test profiles as determined by the Eurofit Test Battery in elite female Gaelic Football players. The present study entailed a cross-sectional comparison of performances in a motor test battery between elite female players and an age-matched reference group. The aim was to identify the fitness items that characterized top performers in the game. Altogether, 83 women aged 18-29 participated in the study and completed a series of tests consisting of 8 items in the Eurofit Test Battery. The profiles of the 2 groups were subjected to logistic regression analysis. Four of the test items contributed to group discrimination (endurance, flexibility, trunk strength, and limb speed). Based on percentage difference, the most prominent discriminator was the estimated \( \dot{V}_{\text{O}_2}\text{max} \) (mean 49.9 ± 4.2 vs. 39.7 ± 6.3 ml·kg\(^{-1}\)·min\(^{-1}\)). Grip strength and agility were also significantly superior in the Gaelic Football players (p < 0.05), who had significantly lower

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body fat values (23.3 ± 2.3%) than the reference group (27.2 ± 3.6%). The use of the Eurofit Test battery in games players was confirmed as were the multi-factorial requirements of fitness for women playing this sport. It was concluded that elite Gaelic Football at top level was characterized mainly by high aerobic fitness, but a holistic training program was needed to cover the multiple fitness requirements of the game. Practical applications include the use of this game for health-related purposes.

Katarzyna Midle, et al. (2007) took up a study to determine the contributions of age, body mass and body height to the total variances of individual EUROFIT tests in girls with deficient body height. Two groups of girls, aged 10 – 18 years, were studied: those suffering from Turner’s syndrome (TS; n = 180) and healthy, short-statured girls (REF; n = 282). The following fitness tests were applied: Flamingo Balance (FLB), Plate Tapping (PLT), Sit-and-Reach (SAR), Standing Broad Jump (SBJ), Handgrip (HGR), Sit-Ups (SUP), Bent Arm Hang (BAH) And Shuttle Run 10×5 M (SHR). Multiple correlations and multiple regression coefficients were used to compute the contributions of age and somatic variables. The result showed that significant contribution of age was found for FLB, PLT, SAR, SBJ, HGR and BAH in TS-

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girls, and for PLT, SAR, SBJ and HGR in healthy girls; body mass contributed significantly to the variances of SBJ and BAH in TS-girls, and of HGR and BAH in healthy girls; body height contributed significantly to the variances of PLT, SAR, SBJ, HGR and BAH in TS-girls, and of SBJ only in the healthy ones.

Toivo Jurimae, et.al.,(2007) investigated a study “Changes in Eurofit Test Performance of Estonian and Lithuanian Children and Adolescents” because both Estonia and Lithuania had a long history of pediatric fitness testing, but due to a lack of standardized test batteries spanning a substantial number of years, secular changes in fitness test performance had not been previously reported. Using the Eurofit test battery, the aim of this study was to quantify the secular changes in fitness test performance of Estonian and Lithuanian children and adolescents during the first ten years of independence. Under methodology two cross-sectional surveys of Estonian and Lithuanian 11- to 17-year-old tested on the Eurofit in 1992 and 2002 were compared. Secular changes were calculated by first, expressing mean values (at the country, age, sex test level) in 2002 as a percentage of mean values in 1992, and second, by subtracting 100 from the resultant and then dividing 10 to express the changed

as percentage changed per annum (p.a.). Negative values indicated secular declines, and positive values secular improvements. The results showed secular changes in Eurofit test performance were calculated for 12,226 Estonian and Lithuanian children and adolescents over the 10-year period. Across all Eurofit tests, secular changes ranged on average from 0.98 to 0.49% p.a., with performances less variable for Estonian children than for Lithuanian children. Secular changes were strikingly consistent across age and sex groups. This was the first study to have described the secular changes in Eurofit test performance of children and adolescents from the Baltic States. It showed that between 1992 and 2002, changes in Eurofit performance varied among tests and were not always in line with European and global changes.

**G.R. Tomkinson, T.S. Olds and J. Borms (2007)** administered a study aimed to describe the variability in fitness test performance among children and adolescents from different parts of Europe. Sixty-seven studies reporting on the Eurofit test performances of healthy European children and adolescents were included in the analysis. Following corrections for methodological variation where appropriate, all data for each test were

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expressed in a common metric. Raw data were combined with pseudodata generated using Monte Carlo simulation. Performances on each fitness test were expressed as z-scores relative to all children of the same age and sex from all countries. For each Eurofit test, sample-weighted mean z-scores were calculated for each country across all age & sex groups for which data were available. The result showed data were collected on 1,185,656 Eurofit test performances by 7-to 18-year-old Europeans from 23 countries. There was considerable variability in the mean z-scores among countries, with the variability among countries differing by test. Overall, the best performing children came from northern and central European countries (0.3-0.4 standard deviations above the overall European average). In conclusion there was evidence that performance was related to socio-cultural factors, such as the place of exercise and sport in the national psyche.

K. Milde, et al.(2006) assessed the physical fitness of short-statured boys aged 7 - 20 years by applying fitness norms established for the Polish population in relation to calendar or growth age. The results of EUROFIT fitness tests recorded in 3517 short-statured (below percentile 10 for body height) boys, aged 7-20 years, selected from a large (n=37 000) representative

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male cohort, were analyzed. Individual results were confronted with the respective percentile norms related to calendar age (CA) or growth age (GA), since body height deficiency at given CA could have affected the results of fitness tests expected for that CA. The percentages of subjects below, the percentile 3 or above percentile 97 for given fitness test and CA or GA for the Polish population, were determined. No differences between the percentages computed for CA and GA were noted in case of the following tests: Sit-and-Reach (SAR) and Bent-Arm Hang (BAH). Significant differences in percentages for both percentiles were found for the following tests: Standing Broad Jump (SBJ), Endurance Shuttle Run (ESR), Handgrip (HGR) and Plate Tapping (PLT). In case of Sit-Ups (SUP) significant differences in percentages between CA and GA norms were found below the percentile 3, and in case of Shuttle Run (SHR) and Flamingo Balance (FLB) above percentile 97. In conclusion, fitness tests were classified into two categories according to the differences between the results related to norms for calendar or growth age: those independent of whether CA or GA norms were applied (SAR and BAH), and those susceptible to the kind of norm (SBJ, HGR, PLT, SHR, FLB and SUP). The results of tests from the later category should thus be evaluated by confronting them with the norms established for the growth age, and not calendar age.