REVIEW OF LITERATURE
REVIEW OF LITERATURE

In democracy, the individual is responsible for his-own health. Yet a democracy recognizes there are something important in the promotion of health that the individual cannot do for him-self and that government must do for him. There is also something that the individual can do for him-self but that can be done better on a community or cooperative basis. In the complex society of today, no one is totally self-sufficient in dealing with all health conditions that will affect him. To supplement what the individual does in health promotion, official and voluntary health organization have been established on local, state, national and international levels operating both cooperatively and independently. These organization protect and promote the health of all citizens.

Some children have good health. With these youngsters the community problem is that of promoting child health to its highest possible level, maintain the health and then safeguard that high quality of health. This means a continuous program. Some youngsters deviate from the normal and thus, are in need of special attention. Certain disorders are of particular importance during the childhood years and an effective community child health program is directed specifically to these childhood disorders as well as to the promotion of child health.

The school health program has been defined as ".... three interrelated parts namely school health services, health education and healthful school living" (Joint Committee on Health Problem, 1961).
The historical development of healthful school living began in 1829 when William A. Alcott indicated the importance of improving school buildings. In 1937, Herry Barnard published an essay on health conditions found within school buildings. In the same year school hygiene was discussed by Horace Mann in his first report to the Massachusetts Board of Education (Richard M. 1962.).

In 1892 the first public school medical officer was appointed in New York City. The Boston Board of health, in 1894, initiated the first medical inspection of school children. The first school nurse was employed by the New York city schools in 1902. State medical inspections compulsory in its public schools in 1906. (Quoted from the book ‘school health program’ by Haag JH. 1968).

At the White House conference on care of dependent children, it was proposed that “.... every needy child should receive the best medical and surgical attention.” School health services were considered at the White House Conference on child welfare in 1920. Vision and hearing testing, health records, control of communicable diseases, dental and nutritional clinics were recommended at the 1920 White House Conference (Quoted from the book ‘School Health Program’ by Haag JH. 1968).

In 1925, the national congress of parents and teachers promoted the summer round-up campaign. The purpose was “... to promote among parents a realization of their responsibility for sending children to school prepared through adequate medical attention" (Quoted from the book ‘School Health Program’ by Haag JH. 1968).

The American Association of School Physicians was established in 1927; in 1938 this Society became the American School Health Association.
Daily health inspections, dental care, weighing, immunization and follow through activities of the nurse were some of the phase of school health services (Quoted from the book ‘School Health Program’ by Haag JH. 1968).

In 1934, “hygiene of the environment” and “school hygiene” were replaced by the term “healthful school living”. Difference in desirable and actual conditions of healthful school living were presented at the 1940 White House Conference of children in a democracy. Daily school meals were stressed both for educational and dietary value (Quoted from the book ‘School Health Program’ by Haag JH. 1968).

The 1940 White House Conference on children and youth recognized the deficiencies in school health services. The delegates proposed the adequate school health services include examination of the teeth, immunization, early detection of disease, through medical examination, vision and hearing tests (Quoted from the book ‘School Health Program’ by Haag JH. 1968).

In 1947, the American Medical Association inaugurated the series of conferences on children and youth advocated that all school personnel work closely with school health services. This Conferences focused attention on the handicapped child (Quoted from the book ‘School Health Program’ by Haag JH. 1968).

In 1953 and 1957, two publications of the Joint Committee on health problems in education of the National Education Association and the American Medical Association had considerable impact on school health services. (Joint Committee on health problem, 1961). The two publication were school health services and health Appraisal of school children.
The 1960 white conference on children and youth dealt extensively with school health services. Some of the problems considered by the delegates were hearing and vision screening, dental and medical examination, tuberculin testing, prevention and control of diseases, health records, immunization, the handicapped child and health service facilities. (Quoted from the book 'School Health Program' by Haag JH. 1968).

**HISTORY OF DEVELOPMENT OF SCHOOL HEALTH IN INDIA**

The beginning of school health services in India dates back to 1909, when for the first time medical examination of school children was carried out in Baroda city. The Bhore committee (1946) reported that school health services were practically non-existent in India and where they existed, they were in under developed state. According to Health Development And Planning Committee Report school health services began exactly 76 years after the French Government for the 1st time in Europe enacted a law (1833) to make school authorities responsible for the sanitary conditions of school buildings and for the health of children (Athavle, 1959).

Viswanathan (1960) reviewing the development of school health services in India stated that in 1914 the corporation of Bombay city undertook the work of periodical medical inspection of school children. In 1921 a permanent department of school medical inspection was established on the recommendation of the school committee. The personnel employed for the Bombay city scheme consisted of (i) five school medical officer both male and female, (ii) health visitors (iii) school clinic organisers and assistant organizers with duties of medical inspection, correction of defects, school sanitation, control of communicable disease, health education in school (Athavle, 1959).
The need for the mid-day meal in all the school was realised and recommended by the committee (school health committee report-I, Govt of India. The school health committee submitted its report in 1961, which contain many useful recommendation. During the five year plans, many state Government have provided for school health and school feeding programmes (School Health Committee, 1961).

**NUTRITIONAL ANTHROPOMETRY**

Anthropometric measurement such as height, weight skinfold thickness and mid arm circumference are valuable indicators of nutritional status. If anthropometric measurement are recorded over a period of time, they reflect the patterns of growth and development and how individuals deviate from the average at various ages in body size build & nutritional status. These three main anthropometric measurements have been mostly employed is community field surveys for childhood & where the age is known.

**WEIGHT**

Malaviya et al (1969) carried out a survey in six basic primary schools where 516 student were examined. It was found that average weight in kg of boys was signifianthy higher than the girls of corresponding age groups. Patodi et al (1977) in a study of health status of school children in some primary schools of indore city, found that males children, weighted more than females for the age group of 5-8 years. But from 9 years onwards till 14 years the females weighted more than the males.
In a study by Dwivedi et al (1978) on health status of primary school children, 6404 students were examined in rural field practice area of Rampur Baghelan and 6734 were examined in Rewa town. It was observed that the average weight of children of areas under study was lesser for respective ages than the weight of Indian children of either sex.

Dhar et al (1979) conducted a study of health status of primary school children in Hazratbal Area (Kashmir) observed that the average weight for age of boys as compared to the ICMR references value exceeded the All India Average upto the age of 10 years, while the Alambagh values were higher upto the age of 9 years as compared to the present study. The weight for age in case of girls as compared with other values showed that the values in the present study exceeded All India Averages upto the age of 9 years and latter All India Averages exceeded the values in the present study.

Sharma et al (1984) in a study on health status of primary school children in urban area, examined 1089 children (625 boys & 464 girls) observed that girls were heavier at 5 & 6 years & 12 years of age while boys were heavier than girls at 7 to 11 years of age. Rao et al (1984) in a study of rural primary school children aged 6-14 years observed that these children weighted less than the children in public school.

Bhasin et al (1990) in a study of well-to-do school children in Haryana observed that mean weight for boys ranged from 19.13 to 52.80 kg. The increment in weight was 33.67 kg. The range of mean weight in case of girls was 18.12 kg at the age of 5 years to 48.52 kg at the age of 15 years and the increment in weight was 30.4 kg.

Kumar et al (1990) in a study of 5-10 years old children of upper socio-economic status observed that the mean weight increased in children
of both the sexes, from 5-10 years of age. There was no significant
difference in the mean weight of boys and girls of any age group, excepting
between 5.0-5.5 years, when boys were found to be heavier than the girls (p
< 0.05). Means of weight, of both boys and girls were equivalent or
superior to children of Gwalior (Shrivastava et al 1978) as well as Somalia
(Gallo et al, 1980). The boys approached to mean value of Delhi (Rath et al,
1978 and Datta et al, 1982) and Hyderabad (Vijayraghawan et al, 1971).

Renu (1990) in a study of female population observed that income
level did not affect the anthropometric measurements but study conducted
by Bhasin et al (1990) reported that socio-economic status significantly
affected the height and weight of school going children.

Parvathi et al (1991) in a study of tribal school going children in the
age range of 6 to 12 years in Kollihills & Pachamali in comparison with
North Indian children observed that mean weight of boys & girls of both
areas were higher when compared to the ICMR standard, Coimbatore norms
& All India standard. The weight deficit ranged between 6 to 16 kg and 4 to
18 kg for girls & boys respectively, when compared with Coimbatore norms.

Sood and Kochar (1993) in a study of school going children of
Kangra Valley in Himachal Pradesh observed that mean weight of these
children were considerably below the ICMR standards. Their study also
reported that family income did not correlate with anthropometric
measurements in either sex. Chandna and Sehgal (1994) in a study of
school children (7-9 years) from Panipat city covering 102 children (51 boys
& 51 girls) observed that the mean weight of boys & girls was significantly
lower than ICMR reference value and was significantly higher in boys than
girls.
Chatterjee et al (1994) in a study of physical growth pattern for boys from rural west Bengal observed that the maximum increase in body weight (5-6 kg.) were seen between 14 and 15 years of age. All the measurements showed highly significant (P<0.001) positive correlations with age height & weight. Mean weight of Bengalee boys were below the 5th percentile of American standard and between 3rd & 25th percentile for weight of British standard. Mean body weight of Bengalee boys when compared with South Indian boys, Singh and Meenakshi (1969) revealed that South Indian boys were shorter and lighter than the boys of present study. Similarly, boys of low socio-economic group reported by Vijayaraghvan et al (1971) are significantly shorter (p < 0.001) and lighter (p < 0.02-0.001) than boys of present study of comparable age. Indian boys reported by ICMR (1972) are shorter and lighter than the boys of present study. Now-a-days anthropometry is widely used by physical educators because the physique of an individual greatly influences his/her performance as reported by Nariyama et al (1988) and Parizkova (1979).

Singh et al (1996) observed in a study of school age children of salt-worker in Rajasthan that the increase in the mean weight, with age, was seen in both sexes. Girls were heavier than the boys during the ages 10-15 years, it was due to menarche Rana et al (1986), Rau et al (1985) and Visweswera Rao (1987) observed in their study that the better growth status has been found associated with early age at menarche. The mean weight of both the sexes in the present study were found to be low in comparison to ICMR Rajasthan reference values at most ages and very low in comparison to WHO (Jelliffe D.B. 1966), NCHS (Nelson WE 1982) and well-to-do Indian Children (ICMR 1990) at all ages.
Balgir et al (1998) in a study of Ashram school children in two districts of Orissa observed that the mean weight of the children aged 6 through 15 years increase with the advancement of age in both sexes. But the sex variation for weight in both districts are not statistically significant. However, for certain age groups like 9, 12, 13 years, these are significant due to the small size of the sample and sample variation. In general girls are lighter in weight than the boys. This pattern is consistent in the present study of Ashram school children in Orissa. Further, the Ashram School children (both sexes) are heavier in all the corresponding age categories than the low income group children of Hyderabad, Andhra Pradesh, (Raghavan et al, 1971) and that of the average Indian school children (ICMR report 1984)

**HEIGHT**

Malaviya et al (1969) in a study of nutritional status of primary school children revealed that average height of school boys in ages of 4-15 years is higher than the girls. Patodi et al (1977) selected randomly eight primary schools located in Indore city examined 1537 students (983 males and 554 females). Their study revealed that male were taller than females excepting at the age of 14 years. When mean height and weight were compared with ICMR standard (1972) it was observed that in present study children were generally lower in average height and weight.

Dwivedi et al (1978) in a study of health status of primary school children of Rampur Baghelan block of Santa district and also children of primary schools situated in the municipal limit of Rewa town, observed that both male and female children of area under study were shorter in height as compared to the average height of Indian children of either sex for the corresponding ages (ICMR 1972) on an average the male children of Rewa
town were taller than their counterparts in Rampur Baghelan block except in the age group of 11 years.

Dhar et al (1979) conducted a survey covered 845 primary school children in Hazaribal area (Kashmir) observed that the height for age of boys as compared with corresponding values of Indian children (ICMR reference value) as urban locality in Alam Bagh, Lucknow (Koshi et al, 1970) and rural locality of Lucknow, Sarojini Nagar (Malaviya et al 1969) indicates that the values in the present study exceed the All India Averages upto the age of 8 years and thereafter there is little difference. The average value of Alambagh and Sarojini Nagar studies are comparable with the present study, there being negligible difference. The height for age of girls, as compared with the similar values of Indian children (ICMR reference value). Alambagh and Sarojini Nagar also shows similar trends upto the age of 8 years and thereafter lags behind to the average Indian values.

Rao et al (1984) in a study of rural primary school children aged 6-14 years observed that height of these children were shorter when compared with children attending public school. The height of boys was more than girls for same age till 9 years of age and than by lagged behind till 13 years of age. Sharma et al (1984) in a study of primary school children in urban area of Meerut city found that the mean height of boys was higher than the girls upto the age of 10 years except at 6,11,12 years when the height of girls crosses over the boys.

Bhasin et al (1990) in a study of well-to-do school children in Haryana observed that the range of mean height of boys extended from 112.68 cm. to 166.17 cm and the total increment in height was 53.49 cm. Haryana well-to-do children were taller than the children in ICMR study (1972) and result were significant (p < 0.05) for all ages and for both sexes
except male children in the ages of 13 and 14 years where the result were not significant (p < 0.05). Datta Banik et al. (1973), chang et al (1963) and Provis et al (1955) reported the same finding.

Kumar et al (1990) in a study of 5-10 years old children of upper socio-economic status observed that the height increased both in boys and girls, from 5-10 years of age. The boys were significantly taller than the girls between 5 and 5.5 years (P < 0.001) and 7.6-8.0 years of age (P < 0.05) Boys from Hyderabad (Vijayarahawan et al, 1971) and those of America (stuart et al 1959, Victor, 1983 and Johnston et al, 1977) were taller at all age groups studied excepting between 9-10 years, when height of Varanasi boys was comparable to Hyderabad (Vijayraghawan et al, 1971) and Guatemalan (Johnston et al, 1977) boys.

Parvathi et al (1991) in a study of tribal school going children aged 6 to 12 years observed that all girls and boys of Kollihills and Panchamali were shorter when compared to ICMR values, Coimbatore Norms and All India Standards. The girls of all age groups except the six years of age Panchamali were taller than their counterparts of Kollihills. The deficit ranged between 7 to 28 cm when compared with the norms of coimbatore. The boys of Pachamali were taller than their peers of Kollihills when compared with the Coimbature norms the deficit ranged between 12-24 Cm.

Sood and Kochar (1993) in a study of health status of school going children of Kangra valley observed that mean height of children were below the ICMR standard. Chandna and Sehgal (1994) in a study of nutritional status of school children (7-9 years) from Panipat city observed that Mean height of boys (115.93 cm.) and girls (114.68 cm.) are significantly lower than ICMR reference value and the recorded value of boys and girls was not significant.
Chatterjee et al (1994) observed in a study of physical growth patterns of school boys from rural west Bengal observed that the height of boys increased during the age of 9-17 years with maximum increase (7.66 cm) being seen between 13 and 14 years of age. Boys of the present study were also superior in body height and body weight by 3.8-11.1 percent and 4.4-39.8 percent respectively to rural boys of Udaipur. Bhandari et al (1972) Gill et al (1968) observed in a study of school children in rural area of Lucknow that boys are inferior in body height and weight by 3.6-12.9 percent and 3.9-42.5 percent respectively to Bengalee boys of this study. Banik et al (1973) and Vijaya Raghuvan et al (1971) reported significantly (P < 0.001) higher values of height for boys of Delhi and well to do Indians. Kaul et al (1976) observed significantly (P < 0.02- 0.01) higher values in body height at 9 and 10 years for boys of Madhya Pradesh as compared to boys of present study. Bangalee boys of the present study were found to be taller than those of the study conducted by Hauplie et al (1980) undertaken in west Bengal between 1952 and 1966. Ghani et al (1971) by 2.8-6.9 percent. Chatterjee et.al. (1991) observed that height and weight of girls exceeded the boys. School going children of west Bengal are lighter and shorter than well-to-do Indian, American & British counterparts explained by genetic factor Graham et al (1979) nutritional and socio-economic factors Dugdale et al (1970) and Environmental factors by Balasuriya et al (1986). Visweswar (1987), Udani (1963) and chang et al (1963) reported that socio-economic and nutritional status play vital roles in determining the growth potential of a child.

Singh et al (1996) in a study of school age children of salt-workers in Rajasthan observed that mean height was equal in both the sexes or better during 10-13 years in case of girls. The mean values of height in both boys and girls were slightly lower than the Rajasthan of reference value (ICMR
1972) at most. Means of height of WHO standards (Jelliffe 1966), NCHS (Nelson 1992) and well-to-do Indian children (ICMR 1990) are very high in comparison to values obtained in children studied at all age. Rau et al (1985) and Qamra et al (1990) earlier also reported the same finding.

Balgir et al (1998) in a study of Ashram school children in two district of Orissa observed that height of school children increases with the advancement of age in both sexes. It was also observed that height of school children are not statistically significant. The boys and girls of Mayurbhanj district are comparatively taller than the boys and girls of Sundargarh district of Orissa, but this difference was not statistically significant. However, Ashram school children belonging to all the corresponding age categorise shows lower value for height and weight as compared to well-to-do children of Hyderabad, Andhra Pradesh (Raghvan et al, 1971).

**MID ARM CIRCUMFERENCE**

Dhar et al (1979) observed that the mid arm circumference values of the present study when compared with the Jelliffe (1966) and the study of Alambagh it reveals that the trend is similar in both the sexes while the value of present study stand at the lowest level, showing very little increase in muscle mass over the years. This difference with respect to other values increase steadily with advancing age, the value of WHO remaining constantly at higher level. This may suggest the presence of protein gap in the dietary intake of these children under study.

Sharma et al (1984) in a study of primary school children in Meerut city observed that their was a gradual increase in mid-arm circumference
with advancing age. Mid arm circumference was higher in girls at all ages except at 7 years where the boys measured more than the girls.

Parvathi et al (1991) in a study of tribal school going children of Kollihills & Pachamalai aged 6-12 years observed that girls and boys of both area had arm circumference less than that of Coimbatore norms & All India standard. Sood and Kochar (1993) in a study of school going children observed that the mean arm circumference value in Utrala males was normal (22.69 ± 2.60 cm), whereas rest of the population it was subnormal compared to reported literature values of Jelliffe (1966).

Chandna & Schgal (1994) in a study of school children (7-9 years) from Panipat city observed that mid arm circumference (MAC) in boys & girls were significantly lower than the reference value. However mid arm circumference were significantly higher in girls than in boys. Higher intake of nutrients by boys might have resulted in better anthropometric measurements in boys than that of girls.

**IMMUNIZATION STATUS**

Patodi et al (1977) in a study of school children in some primary school of Indore city observed that the immunisation status of the school children was unsatisfactory. 5.01 percent children were found unprotected against small pox and 37.6 percent against tuberculosis, while immunisation against diphtheria, pertusis, tetanus and polio was done in very small number of children and on the whole it was not satisfactory.

Dwivedi et al (1978) in a study of health status of primary school children, 6404 students were examined in rural area of Rampur Baghelan block & 6734 were examined in Rewa town. The vaccination status for
small pox was high among primary school children of rural & urban area. 94.8% children in rural & 91.3% in urban area had small pox vaccination scars, while only 28.7% and 56.2% had BCG vaccination in respective areas. Some of the unprotected children were vaccinated during health survey.

Yaima et al (1981) in a study of morbidity pattern in urban school children observed that out of 990 children studied, 951 (96.0 percent) had small pox vaccination scars, 198 (20.0 percent) children had DPT/DT and 204 (20.6) percent) children had cholera and typhoid inoculations. Taking all type of immunisation into consideration male children formed 73.2 percent to 87.9 percent immunisation. Total no. of children vaccinated against BCG was 20.0 percent.

Sharma et al (1984) in a study of Primary school children in urban area of Meerut observed that small pox & BCG vaccination scars were present in 90.54% and 22.68% cases respectively. Small pox vaccination was almost equal among hindus & muslims but coverage of BCG vaccination was higher among hindus (94.40%) as compared to muslims (88.58%).

**PERSONAL HYGIENE**

Dhar et al (1979) in a study of primary school children in Hazratbal Area (Kashmir) observed that the overall personal hygiene was unsatisfactory among 454 (53.7 percent) children out of 845 children examined, being more common among boys than girls.
Agarwal et al (1999) in a study of school girls observed that commonest health problems noted in these girls were related to hygiene (62.2 percent) while dental caries were commoner in younger girls, pediculosis was most frequently seen in older girls of secondary section.

**IRON DEFICIENCY ANEMIA**

Patodi et al. (1977) et al in a study of school children in primary school of Indore city observed that the majority of children suffered from nutritional disorder (27.58 percent) out of which iron deficiency anemia accounts for 6.70 percent of total 1537 children. Shah & Udani (1968) explained that the high incidence of anemia results from one or more factors viz utilization of iron, a low dietary intake of iron & high prevalence of parasitism. Dwivedi et al (1978) in a study of Primary school children in rural & urban area observed that anemia was present in 11.38 percent of school children.

Dhar et al (1979) in a study of school children in Hazartbal area (Kashmir) observed that average haemoglobin value was lower among girls as compared to boys. The mean haemoglobin values were lower in girls as compared to boys (12.17 ± 0.91 gm% and 11.80 ± 1.01 gm% for boys & girls respectively). The average haemoglobin value for both the sexes was 12.05 ± 0.96 gm%. Koshi et al (1970) found 11.8 gm haemoglobin in primary school children.

Sharma et al (1984) in a study of primary school children in urban area, observed that out of 1089 children hindu children accounts for (79.08 percent), muslims (19.28 percent) and sikhs (1.64 percent). Pallor was seen in 20.56 percent cases with almost equal sex ratio. Muslim children had a
higher prevalence rate (24.28 percent) as compared to hindu (19.95 percent) and sikh (22.22 percent). Prevalence of pallor was reported to be, 49.5% by Indirabai and Malika (1976), in the present study pallor was seen in 20.56 percent cases.

Parvathi and Poorani (1991) observed in a study of nutritional status of tribal school going children that haemoglobin values in all age groups children was less than the standard value which is 12 gm percent, Haemoglobin values of all the 200 children was between 7-9 gm percent.

Sharma et al (1991) observed in a study of children that the maximum prevalence (17.0 percent) was seen in girls of 12-18 years from the state of Andhra Pradesh, while minimum prevalence of less than 2.0 percent was seen in children in Karnataka. In other states, it ranged from 2 to 15 percent.

Sood and Kochar (1993) observed in a study of school going children that the mean values of haemoglobin in male and female subjects ranged from 10.84 - 11.00 and 10.61 - 11.22 g/dl respectively. Following WHO (1972) criterion of Hb level 12 g/dl or more as normal, most of the subjects in the present study could be classified as marginally anaemic. Haemoglobin did not correlate with income or anthropometry in either sex. This result was in agreement with Prasad et al (1987) who found no correlation of Hb value with income or anthropometry.

Chandna and Sehgal (1994) in a study of school children 7-9 years from Panipat city observed that the mean haemoglobin 10.83 ± 1.77 and 9.53 ± 1.50 in boys and girls respectively. Mean intake of iron by boys and girls were significantly lower than recommended daily allowances. Intake of iron by boys and girls was almost similar, less intake of green leafy
vegetables might have lead to inadequate intake of iron. Similarly, less intake of iron & calcium was reported by Chandna & Bhat (1984).

Chhabra et al (1996) in a study of boys 6 to 12 years in a children observation home observed that out of 192 boys included in the study pallor was present in 9 (4.7 percent) boys.

Balgir et al (1998) observed in a study of Ashram school children in two districts of Orissa that the school children showed 68 to 75 percent of mild to moderate anemia. These finding are consistent with the study of Gopalan, (1992). It may be due to high prevalence of parasitic infestations and iron, Folic Acid and other nutritional deficiencies and hereditary factors.

NUTRITIONAL DEFICIENCY

(a) Malnutrition

Dhingra et al (1977) also reported a higher prevalence of malnutrition (88.1 percent) in ordinary primary schools as against 41 percent among public schools. In the present study malnutrition was noticed in 52.98 percent cases (Grade I - 31.77 percent, grade II - 15.51 percent, Grade III - 5.69 percent and grade IV - 0 percent).

Verma et al (1980) in a study of nutritional profile of children in rural community of Jhansi district observed that about 54 percent children were observed to be normal in respect of height for age and about 6 percent in respect of weight for age. Analysis further indicate that about 74 percent children were undernourished on the basis of weight for height with more than 5 percent being less than 60 percent or below weight of reference standard.
Sharma et al (1984) in a study of primary school children in urban area of Meerut city revealed that malnutrition was noticed in 52.98 percent cases. Grade-I malnutrition was most common (59.96 percent). None of the cases had grade IV malnutrition. Malnutrition was more common among muslims (68.09 percent) as compared to hindu (50.29 percent). Sikh were least effected (16.6 percent).

Karim et al (1991) in a study of effect of nutrition on school performance in Dhaka (Bangladesh), observed that the higher level of performance by the nutritionally normal children compared to the malnourished children, and existence of a relationship between the examination performance and their nutritional status. The average marks obtained by the nutritionally normal children was 62 percent and by malnourished children was 57 percent. The difference is significant at the probability less than 0.025. About 5 percent of the nutritionally normal children obtained less than 40 percent marks compared to 17 percent of the malnourished children and 23 percent of nutritionally normal children obtained 80 percent or more marks compared to 9 percent of malnourished children. The examination performance of the children classified by their weight for age nutritional status as defined by waterlow criteria (1972). Cravioto et al (1973) also reported that an association exists between the nutritional status of children and their educational performance.

Bapat and Asapatwar (1992) observed in a study of school children of Bombay suburbs that the, 6.62 percent of school age children were suffering from protein calorie malnutrition. Higher prevalence of malnutrition among children indicated that food consumed by these children were of poor quality or were inadequate to meet their growing needs.
Chhabra et al (1996) observed in a study of boys aged 6 to 12 years that out of 192 boys, 121 (63 percent), had a normal nutrition status, while 71 (37 percent) were malnourished. Of these, 32 (16.7 percent) had severe malnutrition and 39 (20.3 percent) had mild malnutrition. In the present study, a large number (36.98 percent) of the boys were malnourished. A similar prevalence of malnutrition has been observed by Verma et al (1971) and Gangadharan (1977) conducted in this age group in the under privileged children of rural and urban areas.

Singh, et al (1996) in a study of school children of salt worker in Rajasthan observed that the 31.0 percent boys and 24.7 percent girls showed stunting, which was significantly higher in boys (P < 0.05). The overall stunting among the children of salt workers was 27.8 percent. Visweswara et al (1990) in their study observed the same overall stunting. The prevalence of severe wasting in the present study was found significantly (p < 0.05) higher in girls (21.9 percent) than the boys (16.0 percent). Prevalence of low (severe) weight for age was almost the same in boys (25.5 percent) and girls (26.8 percent) in the present study. The overall proportion of normal children was 25.5 percent in the present study. The proportion of stunting with severe wasting was 5.6 percent in boys, 3.4 percent in girls indicating a lack of sex-wise difference. But proportion of normal with severe wasting was significantly higher in girls than boys (p < 0.01), indicating that the current forms of severe malnutrition were higher in girls than the boys. Visweswara K et al (1990) and Krishna et al (1991) reported in their study that their is sex wise difference in severe forms of recent and long term malnutrition. Datta Banik (1982) reported that the children whose parents educational level and socio-economic status were higher, had height and weights similar to those of American children.
Agarwal et al (1998) in a study of early undernutrition on reaction time of rural children observed that the premotor, motor and total reaction times in undernourished children were significantly prolonged as compared to those having normal nutritional status throughout the study period. The children who were currently in grade III undernutrition had significantly prolonged reaction time (1.01 ± 0.13 m sec) as compared to those having normal Nutrition status (0.92 ± 0.09 m sec). Bhatia et al (1979) observed in a study that nutrition intervention given even during 3-7 years of age is effective in improving cognitive performance. Agarwal et al (1990), Upadhyay et al (1995), Agarwal et al (1995) and Mishra et al (1996) observed in their study that early life malnutrition in children may result in persistent brain functional deficits leading to prolonged reaction time, soft neurological signs, impaired higher mental function and brain MRI changes are of concern. Upadhyay et al (1989) and Agarwal et al (1989) in their study on rural primary school children (6-8 years) on mental function Weschler's modified intelligence scale, Vineland Social maturity, Bender Gestalt-Visual motor coordination, piaget’s task and memory demonstrated impaired intelligence, being more marked in those stunted. Agarwal et al (1989) observed that stunted wasted children demonstrated presence of soft neurological signs and electroencephalographic changes. Agarwal et al (1991) in a study of learning disability in rural primary school children observed that even children having IQ > 90 showed impaired perceptual maturity and conceptual grasp.

Agarwal et al (1999) observed in a study of school girls from Mumbai that the nutritional disorder were present in 29.0 percent, undernutrition was commoner in younger girls of primary section although stunting was more frequently seen in older girls. Gupta (1989) and Thomas (1992) observed in their study that nutritional deficiencies are widely prevalent in
rural and slum children due to poverty, ignorance and high incidence of infections.

Yadav et al (1999) in a study of nutritional status and dietary intake in tribal children of Bihar observed that the about 60 percent of children were stunted (< - 2 SD) while 40 percent were severely stunted ( < -3 SD). According to weight for age criteria, the overall prevalence of undernutrition (< - 2 SD) was about 55 percent. The prevalence of stunting and underweight was comparable in boys and girls. However, wasting was more frequent in girls (urban 4.5 percent Vs 16.3 percent and rural - 34.9 percent Vs 18.0 percent). Krishnaswamy et al (1997) in a study observed that deficiency is much higher among tribal school children.

**VITAMIN DEFICIENCY**

*Vitamin ‘A’*

Malaviya et al (1969) in a study of school children in the rural health training centre observed that the out of 516 students examined 282 i.e. 54.65 percent showed one or the other manifestations of vitamin A deficiency. It may further be observed that the conjunctival xerosis was the most common (28.68 percent out of 516 examined and 52.48 percent of all the vitamin A deficiency manifestation). This was followed by hyperkeratosis of the skin (25.53 percent of all the vitamin A deficiency manifestations), bitot’s spot (13.83 percent), corneal xerosis (3.54 percent), night blindness (2.83 percent) and corneal opacity (1.77 percent). Further analysis of the cases of follicular hyperkeratosis of skin revealed that out of 72 cases 33 i.e. 45.83 percent were not associated with ocular manifestation.
Patodi et al (1977) observed in a study of School children in some primary school that out of 1537 students age varied from 5 to 14 years vitamin A deficiency was present is 178 students (11.58 percent). Dwivedi et al (1978) in a study of primary school children in Rampur Baghelan block of Santa district & children from Rewa town observed that vitamin A deficiency was present in 22.54 percent and 21.70 percent respectively.

Sharma et al (1984) conducted a study of health status of primary school children in Meerut city observed that vitamin A deficiency was Seen in 24.42 percent cases and was more prevalent in children from lower Socio-economic classes and among children from large sized families. Incidence of xerosis and bitot’s spot were 48 percent and 6.19 percent respectively among muslim children which was three time that of hindus. In Hindus it was 16.26% and 2.63 percent respectively. Merchant and Abraham (1975) reported xerosis and bitot’s spot as 18.60 percent and 2.9 percent respectively.

Sharma et al (1991) in a study of nutrition, health and psychosocial profile of institutionalized children observed that the high prevalence of bitot’s spot (8.5 percent) was seen in boys 6-11 years in Uttar Pradesh and lowest (less than 2 percent) in children of Karnataka. Bapat et al (1992) in a study of nutritional status of school children in slums of Bombay Suburbs observed that vitamin A deficiency was present in 16.86 percent of school children.

Chandna et al (1994) observed in a study of school children (7-9 years) that the serum vitamin A level (µg%) was $14.94 \pm 5.88$ (6.13) and $13.34 \pm 6.10$ (7.78) in cases of boys and girls respectively. Serum Vitamin A was significantly lower than the reference value and was almost similar in
boys and girls. Similar result was also reported by Easwaran and Devadas (1984) among school children of Coimbatore.

Chhabra et al (1996) observed in a study of boys aged 6 to 12 years that out of 192 children signs of specific nutritional deficiency were observed in 24 (12.5 percent) boys. Bitot’s spot suggestive of vitamin A deficiency were the most commonly seen in 10 (5.2 percent) boys. Agarwal et al (1999) in a study of school girls observed that sign of Vitamin A deficiency were limited to conjunctival Xerosis or bitot’s spot and none had night blindness. Vitamin A deficiency was seen in 7.2 percent of total children studied.

**Vitamin - B Complex Deficiency**

Malaviya et al (1969) in a study of school children observed that there was no deficiency of sign of thiamin in any of the student examined, only 1.93 percent showed riboflavin deficiency. The clinical manifestation observed was cheliosis in 1.16 percent (6 out of 516 student). Cheliosis was observed only among boys. Three boys & three girls i.e a total of 6 (1.16 percent) showed angular stomatitis; cheliosis along with angular stomatitis was observed in two boys. Early deficiency of niacin in the form of papillary hypertrophy of tongue was found in 4.48 percent (i.e. 25 out of 516 students examined.)

Patodi et al (1977) conducted a study of primary school children in Indore city observed that sign of riboflavin deficiency was present in 6.96 percent of students. Sharma et al (1984) observed in a study of health status of primary school children that Vitamin B complex deficiency was seen in 3.48 percent cases with a higher prevalence rate among children from lower
socio-economic group and from large sized families. Whereas Merchant et al (1975) reported vitamin B complex deficiency in 4.6 percent cases.

Sharma et al (1991) observed in a study of institutionalized children that highest prevalence of angular stomatitis (32.0 percent) was seen in boys of Andhra Pradesh and lowest (less than 1 percent) in children of Karnataka. Prevalence of phrynoderma was higher (1.2 to 6.8 percent) in the state of Uttar Pradesh compared to other state of girls seemed to suffer more than boys.

Chandna et al (1994) observed in a study of school children aged 7-9 years that the mean intake of thiamine in boys $1.19 \pm 0.14$ (9.61) and girls $1.08 \pm 0.15$ (3.97) were significantly higher than recommended dietary allowances (1.0 mg). Intake of thiamine was significantly higher in boys than girls. Consumption of higher amount of groundnuts have contributed towards the higher intake of thiamine. Similarly, Sarupriya and Mathew (1988) also reported that adequate intake of thiamine by boys and girls, intake of riboflavin in boys $0.63 \pm 0.18$ (1.33) and girls $0.53 \pm 0.13$ (35.03) was significantly lower than recommended dietary allowances (1.2 mg).

Chhabra et al (1996) observed in a study of health and nutritional status of boys that sign of vitamin B deficiency in the form of cheilosis, angular stomatitis and glossitis were seen in 5 (2.6 percent) boys.

**Vitamin C Deficiency**

Malaviya et al (1969) observed that the prevalence of spongy and bleeding gums is 11.29 percent. The prevalence was found to be higher (12.39 percent) among boys while it was 2.36 percent among the girls. Data also shows that prevalence of spongy bleeding gums among the boys
increased as the age advanced, being absent in 4-5 years of age, and highest in the age group of 12-13 years. Among the girls the prevalence was observed only in the age group of 5.6 years (6.25 percent) and 7-8 years (7.14 percent).

Patodi et al (1977) in a study of school children in some primary schools of Indore city observed that out of 424 children signs of vitamin C deficiency was present in only 0.78 percent. Chandna et al (1994) in the study of school children (7-9 years) observed that mean intake of vitamin C in boys was $31.97 \pm 22.08$ (2.59) and in girls $27.54 \pm 17.99$ (4.94) was almost similar.

**Vitamin D or Ca Deficiency**

Malaviya et al (1969) observed that 14.34 percent (74 out of 516) manifested one or the other past sign of rickets further it may be seen that the skeletal defects were more in boys (19.02 percent) than in girls (4.73 percent). It may also be observed that among the boys, leaving the age groups of 13 to 15 years, the percentage of these defects ranged from 10.0 percent to 26.19 percent and occurrence of skeletal defects has no correlation with age. Among the girls the percentage was found to be the highest in age group of 8-9 years while it was found lowest among 7-8 years. An overall review of the occurrence in different age group among the girls reveals that the defect was concentrated between the age groups of 5-10 years. Among the various skeletal defects observed epiphyseal enlargements were 0-19 percent (i.e. in 516 students), beading of ribs 9.88 percent (i.e. 51 in 516), Knocknee or bowlegs 6.39 percent (i.e. 33 in 516) and frontal and parital bossing 6.20 percent (i.e. 32 in 516).
Patodi et al (1977) in a study of school children in primary school of Indore city observed that the amongst nutritional disorders vitamin D or Ca deficiency accounts for 1.43 percentage of total children studied. Sharma et al (1984) in a study of primary school children in urban area of Merrut city were examined 1089 children vitamin D deficiency was seen in 8.38 percent cases. Maximum number of children were between 5 to 9 years of age. Almost equally similar result (8.3 percent) were observed by Dhingra et al (1977).

Agarwal et al (1999) observed in a study of school girls that the vitamin D deficiency in the from of Rickets was present in 0.9 percent of cases and it was more common in girls of primary section 1.4 percent as compared to girls of secondary section where it was 0.4 percent. Kapil et al (1993) and Thomas (1992) in a study observed that nutritional deficiencies are more common in girls as compared to boys. Ignorance about the nutritive valuses of different foods and discrimination against the girls child may be important contributory factors for this observation.

**DENTAL DISORDER**

Malaviya et al (1969) in a study of school children observed that the prevalence of caries was found to be 50.77 percent (i.e. 262 out of 516 students examined). The prevalence among the boys was 53.60 percent while in girls it was 44.97 percent. 107 students out of 516 examined (20.73 percent) showed mottled enamel.

Patodi et al (1977) in a study of school children aged varied from 5 to 14 years observed that caries teeth was present in 3.31 percent children, while tarter deposit on teeth and mottling teeth were present in 6.64 percent and 0.26 percent children respectively overall prevalence of dental disorder
was quite high (10.2 percent) which can be explained by the fact that most of the children did not brush their teeth, or used only finger and water for cleaning their teeth.

Dwivedi et al (1978) observed in a study of school children that disease pattern was almost similar in primary school of rural and urban areas. In rural area dental caries contributed to 44.42 percent & in urban area 43.51 percent of all prevalent ailments. This may be due to the socio-economic and cultural background of people residing in Rewa town is Similar to that of people residing in rural area.

Dhar et al (1979) observed in a study of primary school children that the dental caries (26.51 percent) was the commonest defect observed being more common in boys than girls (30.62 percent boys and 20.06 percent girls). This high rate of dental caries in studied children could be explained by a generally poor orodental hygiene. It is possible that girls are being cared more than boys by their mothers and the boys are free to move outside to use more edibles. Various figures from other authors are: Pal (1966) observed 48 percent children with dental caries, Malaviya et al (1969) reported 50.77 percent children and Indra Bai and Malika (1976) reported 10.3 percent children with dental caries among school children. It is interesting to note that they did not find a single case of dental mottling in children indicating absence of fluorosis in Kashmir. The figures from other studies are Gill et al (1969) found mottling in 16.4 percent school children and koshi et al (1970) found n ottling in 13.7 percent school children. This also corroborates with the fact that no case of fluorosis has been reported from Kashmir so far.
Sharma et al (1984) in a study of primary school children in Merrut city observed that the poor dental hygiene was seen in 40.40 percent cases. Mottling of teeth along with pitting was seen in 8.44 cases. Dental caries was found in 10.44 percent cases with maximum incidence at 7 years. Boys were more prone to dental caries (13.21 percent) as compared to girls (9.48 percent). Dental Caries was more common among muslims (13.71 percent) as compared to hindus (10.71 percent) and sikhs (5.5 percent).

Ganga et al (1991) in a study of dental caries reported out of 500 children, 161 children with caries (75.3 percent had cavity) 182 (36.4 percent) had one or more missing teeth. Nine (1.8 percent) had filled teeth. Males out numbered females in this study, contrary to earlier report Rule, (1982) McDonald et al (1981) reported that brushing of teeth within 15 minute of consumption of sweet reduced carious activity. Singh et al (1985) observed that the dental caries begins even before the 1st year of life.

Sharma et al (1991) in a nutritional, health and psychosocial profile of institutionalized children observed that dental mottling indicating fluorosis was seen in children of Uttar Pradesh (18.0 percent), Karnataka (8.0 percent), West Bengal (4.0 percent) and Andhra Pradesh (1 percent) prevalence of dental caries was seen in all four states and ranged from 1 to 22 percent.

Rao et al (1993) in a study of tribal school children observed that the dental caries was found in 128 (16.5 percent) children followed by calculus in 101 (13.0 percent) children. The less pathogonomic morbid stains were present in 191 (24.5 percent) children. Around 40 percent of children habituated to nus and dantum were suffering from dental caries. However, the prevalence of caries among children habituated to coal, ash, manjan and paste varied between 15-18 percent this difference was significantly greater
(P < 0.005). Shrivastava et al (1990) observed in a study that in Uttar Pradesh only 12.5 percent of rural school children were habituated to tooth powder and ash. Laske et al (1986) observed that granular materials (Manjan, ash and coal) produce irreversible enamel damage and make the tooth susceptible for decay. Traeen and Jostein (1990), Obry-Musset et al (1991), Amid et al (1987) and Ganga et al (1991) reported that more than 80 percent in school children was due to dental caries. Thakre (1989) found that periodontal disease were prevalent among children who clean their teeth with ash, coal and manjan. Vaish, (1983) and Borle et al (1990) reported that tribal children are partially immune to dental caries but Talim (1983) reported equal proportions of periodontal disease among rural and urban children Mathur et al (1979) and Mistry (1983) reported that the relationship of nutritional status and dental caries is controversial.

Chhabra et al (1996) in a study of health status of boys aged 6 to 12 years observed that disease of the oral cavity were the next common morbidity presenting as caries teeth in 21 (10.9 percent) and periodontal disease in 10 (5.2 percent) boys.

Venugopal et al (1998) in a epidemiological study of dental caries observed that out of 2000 children examined 712 (35.6 percent) had caries, with a peak of 69.1 percent at the age of 9 years. Prevalence of caries was 53.5 percent in children with mixed dentition (6-12 year age group). It was 16.4 percent and 37.4 percent among children with primary dentition (1-5 year) and predominantly permanent dentition (13.14 year age group) respectively. The prevalence of caries in males 36.2 percent and female 34.9 percent was comparable (P < 0.05). There was no significant difference in prevalence of dental caries in children belonging to different religious group. But their study does not reveal much influence of parental
income on caries prevalence. Prevalence of caries was low in well nourished children and with vegetarian type of diet, higher prevalence was seen in children consuming sweets several times a day. Vaish (1982) showed higher prevalence among boys. While Verma et al (1986) and Dutta (1965) in their study showing higher prevalence in girls. But Chaudhary et al (1957) sharing similar experience as present study. They has not revealed much influence of parental income on caries prevalence. Khan et al (1990) reported higher prevalence of caries among higher socio-economic groups. Where as Verma et al (1986) and Dutta (1965) reported higher prevalence in low socio-economic group. Gill and Prasad (1968) observed in a study of primary school children that lower prevalence of caries among those using datun. Ann et al (1991) reported significant association between dental caries and frequency of consumption of sugary foods.

Agarwal et al (1999) in a study of school girls observed that the presence of dental caries in 61 percent of younger girls and 29.6 percent of adolescents reflect poor status of dental hygiene in the study population. Dental finding were seen in 26.1 percent girls with caries, mostly in secondary girls. Shetty (1992) reported that dental caries has been reported in nearly half of the school children of Mumbai, more commonly in affluent school children. Tragler (1981), Kapoor and Aneza (1992) reported that girls seem to be more susceptible for tooth decay than boys, for unexplained reason Gupta (1989) reported that dental caries is not so common in rural or slum school girls.
SKIN DISEASES

Patodi et al (1977) in a study of health status of primary school children observed that the out of 35.12 percent skin disorders among school children, majority of them suffered from multiple boils (9.37 percent), dermatitis (8.39 percent) and pediculosis (6.38 percent). High prevalence of these conditions also reflected poor standard of personal hygiene among surveyed children.

Dwivedi et al (1978) in a study of primary school children observed that disease pattern was almost similar in both rural and urban areas. Skin diseases in the form of scabies and boils accounts for 0.78 percent and 1.11 percent of all prevalent ailments in Rampur Baghelan block and Rewa town respectively.

Yaima et al (1981) observed in a study of morbidity pattern in urban school children that the skin disorder accounts for 6.4 percent of total children studied. Sharma et al (1984) in a study of primary school children in urban area of Merrut city observed that the skin diseases were seen in 18.63 percent cases. Pyoderma was seen in 11.47 percent, ring-worm in 5.05 percent and scabies in 2.11 percent cases.

Chhabra et al (1996) observed in a study of boys aged 6 to 12 years that the skin disease was the commonest morbidity (31.7 percent). Skin infections in the form of pyoderma, scabies and Prickly heat accounts for 14.6 percent, 10.4 percent and 6.7 percent respectively. Gangadharan et al (1977) reported the prevalence of skin infections as 23 percent in rural school children while Mukherjee and Sen Gupta (1960) observed a prevalence of 4.9 percent in urban school children and Rao et al (1984) reported a prevalence of 12 percent in rural school children.
difference may be because of the living conditions, personal hygiene and climatic variations.

Agarwal et al (1999) in a study of health status of school girls from affluent population of Mumbai observed that the skin infections accounts for 7.0 percent of total children studied. Skin infections in the form of scabies and pediculosis was present in 2.5 percent and 21.5 percent respectively. Prevalence of scalp lice infestation in primary school girls has considerably declined to 10.5 percent, since in earlier study from the girls of same age group done in 1981, when it was seen in 46.6 percent Tragler (1981).

**LYMPHADENOPATHY**

Patodi et al (1977) in a study of primary school children aged 5 to 14 years observed that the lymphadenitis accounts for 0.78 percent of total children studied. Gangadharan (1977) in a study of school health service in Kerala observed cervical lymphadenopathy in 2.43 percent of the school children. Joseph (1977) observed lymphadenopathy in 2.1 percent of school children.

Dhar et al (1979) observed in a study of health status of primary school children in Kashmir that 8.16 percent children had submandibular lymphnode enlargement and 3.43 percent children had cervical gland enlargement. Enlargement of tonsils among 11.45 percent children was present in the study. Ray et al (1971) observed 7.95 percent tonsilitis and Dhingra et al (1977) found enlargement of tonsils among 5.6 percent children.

Yaima et al (1981) in a study of morbidity pattern of urban school children reported that lymphadenopathies was present in 9.2 percent of total
Dhar et al (1979) in a study of primary school children observed that ear wax was present in 7.17 percent and 5.17 percent of boys and girls respectively. Discharge in ear was present in 4.26 percent 3.65 percent in boys and girls respectively. Yaima et al (1981) reported in a study of morbidity pattern in urban school children that the ear disorder constitute 1.7 percent. Total prevalence of ear disease in case of male children was 2.2 percent while in case of female it was 0.8 percent.

Sharma et al (1984) in a study of primary school children in urban area observed that chronic suppurative otitis media was seen in 28 (2.57 percent) cases, otitis externa in 5(0.46 percent) cases and hearing defect in 0.27 percent cases. It was seen more Commonly in muslims (4.76 percent) as compared to hindu (2.10 percent).

Chhabra et al (1996) in a study of health and nutritional status observed that ear disease in the form of chronic suppurative otitis media, and wax in ear constituted 7.3 percent and 1.5 percent respectively. Agarwal et al (1999) in a study of school girls observed that the deafness was present in 0.4 percent of cases and otitis media accounts for 2.0 percent of total studied girls.

**DEFECTS OF THE EYE**

Patodi et al (1977) in a study of primary school children observed that the main ophthalmic disorders were defective vision (8.59 percent), acute conjunctivitis (7.09 percent), blepharitis (3.90 percent), stye (2.80 percent) and trachoma accounts for 2.02 percent cases. Which can be treated and corrected easily with the help of teachers in schools. Other eye diseases which require specialist care were corneal opacity (0.78 percent), strabismus (0.32 percent) and cataract (0.19) percent.
Dwivedi et al (1978) in a study of primary school children observed that the diseases of eye in the form of trachoma conjunctivitis, refractory errors and corneal opacities contributes to 12.17 percent and 12.37 percent of all prevalent-aliment in rural and urban area respectively. Dhar et al (1979) in a study of primary school children observed that eye diseases in the form of conjunctivitis and blepharitis contributed to 0.38 percent of cases.

Shrivastava et al (1981) in a study of prevalence of Trachoma in school children of rural community observed that the overall prevalence of trachoma in children aged 5-14 years was 34.1 percent. There was gradual decline in the prevalence of trachoma with the advancement of the age being highest in the age group 5 to 6 years (50.8 percent) and lowest (31.2 percent) in the age group 11-12 years. This difference in the prevalence with age was significantly different (P < 0.05).

Yaima et al (1981) in a study of urban school children reported that total prevalence of eye disease was 6.1 percent. It was more common in male children than the female children. Sharma et al (1984) observed in a study of primary school children of urban area of Merrut that the eye disease were Seen in the form of conjunctivities (4.5 percent), stye and blepharitis in 6.27 percent cases, congenital squint 0.18 percent cases and keratomalacia in 0.09 percent cases.

Agarwal et al (1999) observed in a study of school girls from affluent population of Mumbai that the refractory errors (visual activity > 6/9) were seen in 564 (49.3 percent) girls, including 56.8 percent and 40.3 percent girls of primary and secondary sections respectively. Only 9.4 percent total
girls were actually using spectacles, including 4.4 percent of primary and 15.6 percent of secondary section girls. Refractory errors were noticed in nearly half of girls, more frequently than that reported by Tragler (1981) and Shetty (1992).

**RESPIRATORY SYSTEM**

Dwivedi et al (1978) in a study of health status of primary school children in rural and urban area reported that prevalence of respiratory tract infection in children from Rampur Baghelan block was 6.58 percent while children from Rewa town it was 6.89 percent. Study showed that disease pattern was almost similar in both areas. This may be because the socio-economic and cultural background of people residing in Rewa town is similar to that of people residing in rural area.

Yaima et al (1981) observed in a study of morbidity pattern of school children that respiratory disorder accounts for 2.8 percent of total morbidities. In case of male children prevalence of respiratory disease was 3.5 percent and in case of female it was 1.5 percent.

Chhabra et al (1996) in a study of health status of boys observed that total prevalence of respiratory tract infection was 8.7 percent. Respiratory diseases in the form of upper respiratory infection accounts for 7.2 percent, while pneumonia was present in 1.5 percent of children. A similar prevalence has been observed by Gangadharan (1977) Rao et al (1984) and Sharma et al (1991) in studies conducted in school.

Agarwal et al (1999) observed in a study of health status of school girls from affluent population of Mumbai that the respiratory disease in the form of bronchial asthma in 6.6 percent of subjects is not unexpected, as
Mumbai has hot and humid climate with heavy pollution. 0.8 percent of girls had tubercular infection of lungs.

**CARDIOVASCULAR SYSTEM:**

Merchant and Abraham (1975) in a study of children in Bombay city observed that functional murmurs was present in 7.4 percent children, congenital heart disease in 1.2 percent and constrictive pericarditis in 0.12 percent children.

Agarwal et al (1999) in a study of school girls observed that cardiac disease accounts for 0.5 percent of cases. Among six cardiac lesion, two were rheumatic in origin. Hypertension was seen in 2.2 percent girls and nearly half of them were obese.

**GASTROINTESTINAL DISORDER**

Patodi et al (1977) in a study of school children in primary schools of Indore city observed that out of 1537 school children examined disease of gastrointestinal system was present in 1.56 percent of individuals.

Chhabra et al (1996) in a study of boys aged 6 to 12 years observed that total prevalence of gastrointestinal disorder was 8.8 percent. Diarrhoea was the most common gastrointestinal morbidity observed, being present in 4.7 percent of boys, followed by worm infestation (3.6 percent) and acid peptic disease (0.5 percent) in total boys studied.
**WORM INFESTATION**

Dhar et al (1979) in a study of primary school children in Hazratbal area (Kashmir) observed that prevalence of ascariasis was almost universal, 94.20 percent. All the age groups had infestation children with mild infestation was 33.50 percent, with moderate 48.64 percent and 12.10 percent children had severe infestation. However Wani (1970) found 80.7 percent ascariasis infestation in kashmir and Gill et al (1969) in their study have shown 0.8 percent prevalence.

Yaima et al (1981) in a study of urban school children reported that worm infestation was present in 24.8 percent of cases. It was more in male children (27.4 percent) than in female children (20.3 percent) and this might be attributed to out of home eating habit.

Agarwal et al (1999) in a study of school girls from affluent population of Mumbai observed that overall prevalence of worm infestation was 17.0 percent, it was 24.1 percent in girls of primary section and 8.4 percent in those of secondary section. Worm infestation were common in younger girls, as reported by Tragler (1981) and Gupta (1989).

**LIVER & SPLEEN ENLARGEMENT**

Malaviya et al (1969) in a study of primary school children reported that liver was found palpable and enlarged in 6 students out of 516 (i.e. 1.16 percent). This enlargement of liver was not found associated with tenderness. No case of enlargement of spleen could be detected.

Agarwal et al (1999) observed in a study of school girls that the splenomegaly was present in 1.6 percent of total children studied.
**DISEASES OF GENITO-URINARY SYSTEM**

Gangadharan (1977) observed that 1.09 percent children had genitourinary disease (phimosis 0.04 percent, chronic UTI 0.57 percent). Dhingra et al (1977) observed 0.6 percent disease of the urogenital system in corporation school as compared to nil in public school of Delhi. Sundaram (1978) observed undescended testis in 0.1 percent corporation school children as compared to 0.1 percent private school children.

Patodi et al (1977) observed in a study of health status of school children in primary schools of Indore city that disease of genitourinary system was present in 0.20 percent of total children studied. Agarwal et al (1999) observed in a study of school girls that urinary tract infection was present in 0.9 percent of cases.

**DISEASES OF SKELETAL SYSTEM**

Merchant and Norah (1975) observed orthopaedic disorders like pigeon chest, T.B. Spine, dislocation etc present in 3 children out of 835 children. Gangadharan (1977) observed 0.52 percent having musculo-skeletal disease (residual polio in 0.13 percent, kyphoscoliosis 0.13 percent).

Sundaram (1978) observed residual polio in 0.2 percent corporation school children as compared to 0.1 percent in private school. Other orthopaedic defects were 0.8 percent and 0.4 percent respectively. Yaima et al (1981) observed musculo skeletal disorder in 0.3 percent school children.
DISEASES OF CENTRAL NERVOUS SYSTEM

Patodi et al (1977) in a study of health status of primary school of Indore city reported that diseases related to nervous system was present in 3 children and proportional morbidity rate was 0.15 percent. Gangadharan (1977) observed CNS disorder in 0.67 percent children. Joseph (1977) observed epilepsy in 0.10 percent cases.

Agarwal et al (1999) in a study of school girls observed that among the central nervous system disorder epilepsy accounts for 0.4 percent of cases.

THYROID ENLARGEMENT

Malaviya et al (1969) in a study of primary school children observed that 14 out of 516 students examined (2.7 percent) showed enlargement of thyroid gland. The majority of them fell within the age group of 4-7 years.

CONGENITAL DEFECTS

Dwivedi et al (1978) in a study of health status of primary school children observed that children from Rampur Baghelan block, 0.08 percent had congenital anomalies while children from Rewa town reported prevalence was 0.41 percent.

Yaima et al (1981) in a study of morbidity pattern in urban area observed that total prevalence of congenital defect found in male children was 0.4 percent but no case had been reported in female children.
BEHAVIOUR PROBLEMS

Srivastava et al (1978) observed that number of children having behaviour problems in public school was 31.57 percent and in Govt school was 37.67 percent. Nocturnal enuresis was present in 26.24 percent children and 34.51 percent children respectively.

Agarwal et al (1999) observed in a study of health status of school girls that the behavioural problems are common due to excessive stress, competitiveness, high parental expectations and consequent anxiety. In their study most of the problems seen i.e. nail biting, vague aches and pains, thumb sucking etc., indirectly indicate highly stressful and anxiety related behaviour. These problems were less frequently noted in older girls probably in the absence of experienced psychiatrist, it was difficult to extract the hidden behaviour of older girls. Narang et al (1991) in a study of psychiatric symptomatology in children in high & low socio-economic group, observed that behavioural problems were mostly due to anxiety. It was observed that nail biting was present in 6.5 percent, vague aches and pains in 3.4 percent, pica in 3.2 percent, thumb sucking 1.1 percent, nocturnal enuresis 0.8 percent, miscellaneous 0.6 percent of cases.

SPEECH

Joseph (1977) in a study of health problems in rural school children observed that speech disorders were present in 0.5 percent of school children.

Shrivastava et al (1978) observed that 2 percent children from public school (lalling 1.43 percent and stammering 0.58 percent) had speech disorder as compared to 7.33 percent from Govt school (4.33 percent lalling
IQ

An IQ is an expression of an individual's ability level at a given point in time, in relation to his age norm. To the layman, the IQ is not identified with a particular type of score on a particular test, but is often a shorthand designation for intelligence. IQ is not fixed and unchanging and it is amenable to modification by environmental interventions. According to Alexander Bain intelligence is the aggregate or global capacity of the individual to act purposefully to think rationally and to deal effectively with his environment.

New born child grows in all spheres of development, his muscle grow in size and strength, the brain grows in size, his nervous system assumes greater and greater complexity, he also grows mentally. The innumerable ability which form part of what is called intelligence grows steadily. In fact it is known that there is a great parallel between physical development and mental development. This subtle relationship between the two lead Alfred Binet to postulate an index of brightness expressed in term of the ratio of mental age (M.A.) to the chronological age (C.A.).

IQ is not fixed and unchanging and it is amenable to modification by environment interventions. Other evidence comes from a variety of investigations dealing with the effects of education, special training programs and major environmental changes (Anastasi, 1958). An individual’s intelligence at any point in time is the end product of a vast and complex sequence of interactions between hereditary and environmental factors.
In different cultures and at different historical periods within the same culture, the qualification for successful achievement will differ. The changing composition of intelligence can also be recognized within the life of individual from infancy to adulthood. An individual’s relative ability will tend to increase with age in those functions whose value is emphasised by his culture or subculture and his relative ability will tend to decrease with age in those functions whose value is de-emphasised (Levinson, 1959, 1961).

Nutrition of the children is an important physical factor for the growth and development of this most important cognitive ability. Maier (1932) showed that malnutrition in rats resulting in 3 percent changes of cerebral tissue affects the complex learning processes. Similarly the animal studies of Champakam (1968) revealed that protein calorie malnutrition not only retards the physical growth but also impairs several aspects of mental faculties.

Cravioto (1971) again assessed the level of intelligence of school children who in early infancy had been admitted in the hospital for malnutrition. The intelligence level was measured by wechsler intelligence scale in which both verbal and performance tests were applied.

**PHYCHOSOCIAL ASSESSMENT**

Gupta et al (1975) in a study of school children observed that children from nourished group performed better as compared to malnourished group on the Stanford Binet test of intelligence. All the children in nourished group had their IQ’s more than 90 whereas only 27.1 percent children from the malnourished group was as much as 29 points higher as compared to malnourished group.
Dhingra et al (1977) observed in a study if school children from public schools and corporation school observed that children belonging to public schools were comparable to the corporation school children for their age but not for their socio-economic states. Mean IQ of public school children were significantly higher as compared to the children of same nutritional status. Children of class I obtained an IQ between 121-130 where as social class IV children obtained an IQ of 100 and below with 18.5 percent as mentally subnormal, 86.6 percent of social class II children had IQ above 101. Majority of social class III children (83.7 percent) were found having IQ between 91-100.

Dwivedi et al (1978) in a study of health status of primary school children in rural and urban areas observed that prevalence of mentally retarded children in Rampur Baghelan block was 0.28 percent while in Rewa town it was 0.44 percent of all prevalent ailments.

Kadam (1984) in a study observed that if malnutrition is severe and occurs early may result in reduced mental development due to impairment of brain development during the period of rapid growth. Puri (1984) observed that adequate quantity of good quality protein does enhance I.Q. Inference drawn is that supplementary feeding in pre-school children showed significant improvement in I.Q. of children.

Darrel and Wilson (1986) in a study of children observed that therapies designed to increase height are unlikely to alter measures of intellectual development. They used weschler intelligence scale.

Chaturvedi (1987) observed that upper intellectual grade IQ ≥ 110 were greater in ICDS sample of children who were better nourished. Shrivastava (1988) observed in a study of school children using Ravan
coloured progressive matrices, that the median IQ of nourished children was found to be 112.5 and for malnourished children was 94.5. The median IQ of malnourished children was found to be decrease with the increase in the degree if malnutrition being 96.0 for grade I, 87.0 for grade II and 77.5 for grade III malnourished children.

Sharma et al (1991) in a study of psychosocial profile of children observed that the mean scores on Binet-Kamat and draw a mean tests in different nutritional grade showed significant differences. The mean IQ level showed a decreasing trend with lower nutritional grades. However, in case of social maturity scale the scores were above average in all the nutritional groups. Children with normal nutritional status IQ was ≥ 95, with grade I undernutrition IQ ranged from 90-95 and grade II+III undernutrition IQ was below 90.

SCHOOL ENVIRONMENT

Recommendations for healthful school living were made regarding environmental factors and the school day lighting, heating and ventilation, water supply and toilet and shower room facilities were some of the items considered necessary to healthful school environment. Hygiene were replaced by the term “healthful school living”.

The school building, site and equipment are part of the environment in which child grows and develops. A healthful school environment therefore is necessary for the best emotional, social and personal health of the child.
Sundaram (1979) in a study of primary schools of Madras city comprising both of corporation and private schools observed that private school (84 percent) were better located than corporation schools (55 percent). Corporation schools are located in close proximity to the residences of the economically weaker sections of the society while private school were located in proper environmental hygiene. Maintenance of buildings in corporation schools was not satisfactory. Inadequate space for class rooms was a common feature in both group (72 percent and 66 percent). Only 50 percent of both group were adequately lighted & ventilated.