CHAPTER VII
SUMMARY, RECOMMENDATIONS, AND FUTURE RESEARCH IMPLICATIONS
7.1. SUMMARY:

7.1.1. Introduction.

Children are the citizens of tomorrow who would substantially and significantly contribute towards socio-economic development of a nation; and hence the physical and mental health of a child become important issues. Unfortunately enough India is one of the developing countries which has as large as 33% of under-five infant mortality mainly due to malnutrition. Hunger and malnutrition are serious problems in Asia, South America and Africa which prove hazardous towards normal development of mind and body of a child. Nutrition vis-a-vis protein deficiency is one of the commonest factors in creating health hazards, and therefore demands special research attention. Evidences are plenty, from the reviews of nutrition and dietary surveys/studies, particularly those of the ICMR, that 35% of children do not get adequate protein in their regular diet, and alarmingly as large as 92% do not get adequate calories. However, the effects of socio-cultural and environmental processes on physical and mental development of Indian children has not been extensively studied, even though it has been believed that these socio-cultural factors have a significant influence in dietary practices/food habits and quality and quantity of calorie intake in particular. Some important studies (Sen, 1976; Mohanty, et.al., 1988; Easwaran, et.al., 1972; Martin, 1973 and Udani, 1963) have established that poverty itself prevents healthy development with regard to physical status and academic performance of a child. Adverse economic condition resulting in poor house and sanitation, inadequate health care, susceptibility to disease, large family size, insufficient
living space, restricted educational opportunities, unfavourable feeding and child care practices etc. (Cravioto, 1970; Rath, 1976; Rath, et al., 1979 and Chowdhury, 1984) always lead to retarded physical and educational development and most frequently causing premature death. Nevertheless nutritional status has been regarded as most important causal factor for mental impairment in addition to social, environmental, obstetrical and genetic factors.

Children are like barometers, which reflect the nutritional status of the community. Imperatively any improvement in the quality of child life is clearly a step towards social and economic development of a country. In such a premise the objectives of the present study were formulated to:

1. ascertain the nutritional status of the children,
2. find out the factors responsible for nutritional deprivation,
3. see the effects of nutritional status on physical development,
4. ascertain the effects of malnutrition on educational achievement,
5. assess the environmental factors responsible for the physical development of the children,
6. find out the causes for poor educational performance of students, and
7. suggest measures for amelioration of this situation and improvement of the health as well as education of children.
However the scope of the work was limited to ascertain the nutritional status of the children, particularly living in poor state like Orissa, and to find out the extent to which their physical development and educational achievement have been affected, in the backdrop of three different places of residence (urban, rural and slum) and various other variables pertaining to home and parental conditions.

7.1.2. Methods and Techniques.

The present study, which was essentially exploratory in nature, involved school going children at three different areas: urban, rural and slum. To find out developmental status and educational achievement, the researcher selected four groups of children from each area, in the age of 6, 7, 8 and 9 years, from both the sexes.

The researcher followed questionnaire methods for ascertaining the physical development status and evaluating the students' potentialities. And one interview schedule was used for collection of information regarding the nutritional intakes and family background. The researcher used anthropometric indicators such as height (cm.), weight (kg.), mac (cm.), chest circumference (cm.), head circumference (cm.), skinfold thickness over tricep (mm); level of haemoglobin (gm%) and clinical examination of signs of deficiency diseases. To measure the academic potentialities Teacher Evaluating Inventory and Academic Achievement methods were used. For the assessment of nutritional status calorie values of food consumed by the children for three consecutive days and for the data regarding home background parents of the children were interviewed using a structured schedule.
Data thus gathered were treated, scored and analysed using standard statistical procedures which helped in objective interpretation of the findings. Group means were first computed to observe gross differences in various indices. Correlation co-efficients were computed to establish and ascertain the relationship between groups across various dimensions. Finally, analysis of variances was done on a few important dimensions to further examine the interactional pattern between background variables and the development of the child; and significant difference between different groups of subjects, across area and age dimensions.

7.1.3. Analysis and Interpretation of Data.

The data pertaining to various factors affecting nutritional status, physical development and educational achievement in three different localities, across four age groups and both the sexes were analysed to find out mean differences, inter-correlations between various factors and degree of their variance.

Nutritional Status:

Nutritional status of urban children was found to be better (1462.87) than that of rural children (1356.22). Slum children had poorer nutritional status (1313.08) than children of both the rural and urban areas. Children of each age group also showed a gradual increase in calorie intake (6 years - 1232.19, 7 years - 1337.77, 8 years - 1420.13 and 9 years 1501.75) with the advancing age. And so far as sex was concerned, boys had a little more calorie intake (1389.07) than the girls (1356.9).
Level of education was found to be one of the important factors responsible for nutritional status of the child as found from its positive and significant correlation with nutritional status in case of both the sexes and different age groups except 6 years children.

It was found that the parents' education in urban areas was higher (27.97) than rural (11.31) and slum areas (11.27) and that might be leading to better nutritional status of urban children which was proved by its positive correlation.

Impact of income of the family on calorie intake of the child was found from its significant correlation in case of three areas, four age groups and both the sexes.

Monthly income of the urban families was higher (Rs.1838.74p.) than rural (Rs.758.47p.) and slum areas (Rs.438.56p.) which might be responsible for better nutritional status of urban children than rural and slum children.

Size of the family including children was proved to be a causative factor of affecting nutritional status. As found from the interpretation of the result, its correlation with nutritional status was found to be inverse and significant in most of the cases.

In urban families, number of children was less (2.7) than rural (3.69) and slum (3.76) families. Members in urban families were more (5.47) than rural families (4.9) but higher in slum families (6.34). It might be due to better economic condition and parents' education, food intake of urban children did not get affected as was the case for rural and slum children.
Physical Development:

With regard to growth and development, urban children were of better health status than their rural and slum counterparts, and rural children had better physical development than slum children. Also in case of different age groups, the results showed that each advancing age had better growth and development. However, boys were ahead of girls.

With regard to height, urban children were better (123.55 cms.) than rural children (117.96 cms.) and rural children were better than slum children (116.72 cms.); and for different age groups, 9 years children (128.37 cms.) were found to be the tallest. Height of 8 years children (122 cms.) was more than 7 years children (116.91 cms.) and 7 years children were taller than 6 years children (110.39 cms.). In case of both the sexes girls' height (118.62 cms.) was lower than that of boys' height (119.96 cms.).

Weight of the urban children (21.68 kgs.) was better than rural children (19.37 kgs.), and slum children (18.44 kgs.) had poorer weight than rural children. It was also found that amongst different age groups 9 years children (23.27 kgs.) had more weight gain than other age group of children. 6 years children had lowest weight (16.38 kgs.) gain than others, 7 years children's weight (18.96 kgs.) was lower than that of 8 years children (20.72 kgs.). Girls' weight (19.42 kgs.) was lesser than that of boys' (20.23 kgs.).
Mid-upper arm circumference (mac) was found lowest in case of slum children (14.36 cms.), whereas mac of urban children was highest (15.65 cms.) than rural children (14.98 cms.). Mac for 9 year children (15.61 cms.) was more than others; 8 years of children (15.05 cms.) had better mac than 7 years (15.03 cms.) and 6 years (14.32 cms.). However, in respect to both the sexes, girls' mac (15.20 cms.) was lesser than boys' mac (15.39 cms.).

Urban children's chest circumference was more (55.36 cms.) than rural (55.22 cms.) and slum children (54.40 cms.); 6 years children had the lowest (52.59 cms.) chest circumference. The chest circumference of 9 years children was the highest (57.67 cms.). The 7 years children's chest circumference (54.01 cms.) was lower than that of 8 years of children (55.57 cms.). Boys' chest circumference (55.21 cms.) was better than girls' (54.71 cms.).

Head circumference of urban children (50.11 cms.) was better than rural (49.72 cms.) and slum children (49.73 cms.). With regard to age groups upper age groups' head circumference was higher than that of lower age groups of children (9 years - 50.82 cms, 8 years - 49.83 cms., 7 years 49.75 cms. and 6 years - 49.02 cms.). Girls' head circumference (49.37 cms.) was lower than that of boys' (50.34 cms.).

Slum children's tricep (6.16 mms.) was the lowest compared to other two areas, whereas urban children's tricep (9.91 mms.) was better than that of rural children (7.45 mms.). Amongst different age groups 9 years children's tricep (7.5 mms.) was higher than other age groups. Children
of 8 years had better tricep (8.42 mms.) than 7 years (7.45 cms.) and 6 years children had the lowest tricep (6.01 mms.). Tricep of boys (7.37 mms.) was less than that of girls (7.40 mms.).

Deficiency diseases in slum children were more (1.87) than rural (1.06) and urban children (0.21). In respect to age groups, in 6 years children deficiency diseases (1.20) were more than 7 years (1.07), 8 years (0.96) and 9 years (0.97) of children. However, girls were suffering from less (0.97) number of deficiency diseases as compared to boys (1.13).

Haemoglobin level of slum children was the lowest (81.01%). It was also lower in rural children (86.69%) as compared to urban children (89.45%). Across age groups, 8 years children had highest (87.14%) haemoglobin level followed by 9 years (85.33%), 7 years (85.89%) and 6 years (84.67%).

Physical development of children was also found to be affected by their food intake as was evident from their significant correlations in almost all the cases.

Most of the indicators of physical development were affected by the parents' education, and in some cases their correlation coefficients were significant.

In most of the cases also, income of the family was related to physical development showing its effect on physical growth and development.

Further, size of the family was found to affect the health status of the children as found from their correlations which were significant in some cases.
Educational Achievement:

So far as educational achievement was concerned urban children had the highest (TEI - 47.80; AA - 51.60) achievement when compared to rural (TEI - 33.96; AA - 35.03) and slum (TEI - 28.74; AA - 28.33) children, and rural children's achievement was better than slum children.

Amongst different age groups educational achievement was better in 7, 8 and 9 years children (7 years-TEI-36.13, AA-37.34; 8 years-TEI-35.22, AA-37.17; 9 years-TEI-36.51, AA-39.78) than 6 years of children's educational achievement which was lowest (TEI-32.22, AA-31.77).

Boys' achievement was found to be better (TEI-36.13, AA-37.42) than that of girls' (TEI-33.91, AA-35.60).

The present study revealed that children having better nutritional status were rated highly and found to be securing the highest marks than the children having poor nutritional status as proved in case of children of three areas where urban children's educational achievement was better than the children of other two areas.

Parents' level of education also influenced the educational achievement of the children as found from its significant correlations in almost all the cases.

Economic condition of the family also determined the educational achievement of the children as was evident from its positive and significant correlations in most of the cases.
Educational achievement was also influenced by number of children and members in the family which was proved by their inverse and significant correlations in most of the cases.

Parental interest in the study of the children was also an influencing factor which showed a significant correlation with educational achievement in all the cases except for rural and slum children.

Educational achievement was also affected by the physical facilities provided at home for study, as was proved from their significant and positive correlations.

Children's educational provisions at homes also affected their achievement in academic career as revealed from their significant correlation.

Lastly, from the interpretation of educational achievement and physical development it was found that physical development had its effect on the educational achievement of the children as reported in most of the cases where there were significant correlations. This proved that children of better health status were doing well in their educational achievement.

In order to compare groups across age and area dimensions, and to establish the nature of relationship ANOVA was done for five important variables. For calorie intake, the differences between sub-groups corresponding to age were found to be very highly significant, and for other four variables the differences were non-significant. Thus it was found that the children belonging to four different age groups were very well
comparable, but there was little or no difference in respect of four major background variables, viz., parents' education, family income, number of children, and number of members in the family.

Comparison across area of living (urban, rural and slum), inter-group differences were found to be very largely significant, for all the five variables mentioned above. Hence, the four different age groups of children were different from each other in any particular area, from the other two. In other words, children of three areas greatly varied both in calorie intake, and for their background variables. However, within group differences were marginal and non-significant in most cases.

7.2. RECOMMENDATIONS:

On the basis of the above findings, the following recommendations are proposed to the Government and concerned agencies and organisations for ameliorating the existing conditions.

(a) Since none of the children was getting adequate food in their daily intake as per the ICMR recommendations as was confirmed by the findings of this study, the state and other voluntary agencies need to plan and implement development programmes for improving the nutritional status of the children in general, and those of the poor sections in particular.

(b) As the parents' education has proved to be of immense importance in improving the nutritional status, physical growth as well as development, and educational performance of the children, there ought to be multipronged efforts by the state and other agencies
to educate the people, especially in rural and slum areas, regarding the nutritional requirements of the children, and its importance with regard to their growth and development as well as educational achievement. It is proposed that effective ways of educating the parents, who are out of formal education, could be through extension education programmes.

(c) Since economic conditions of the family has much significance in maintaining nutritional status of the children, the government vis-a-vis voluntary agencies may take adequate steps towards improvement of the economic status of the communities.

(d) As has been found, size of the family has negative correlation with the nutritional status, ultimately affecting the growth and development and educational achievement of the children, the family planning/welfare programmes being implemented at present should be reviewed and made more effective and attractive in order that objectives of child welfare can be actualized.

(e) Since physical development and educational achievement of the children were hampered due to lack of sufficient food and nutrition, the current school mid-day meal programme should be more effectively planned and strengthened.

(f) As educational achievement was found to have been influenced by physical development there should be a systematic and continuous school health programme, comprising of the following measures, to achieve physical, mental and social well being of the children.

i) Provision for medical check up of the children,

ii) Remedial measures and follow-up,
iii) Preventive measures,
iv) Nutrition services,
v) Maintenance of mental health,
vi) Nutrition and health education, and
vii) Maintenance of health records.

(g) Further provisions may be made for good and healthy school living which includes good hygienic environment of the school with cleanliness in and out of the school premises; adequate space in the class room according to number of students; proper ventilation and light conditions; hygienically suitable drinking water provision; and facilities for sanitary latrines, etc.

7.3. FUTURE RESEARCH IMPLICATIONS:

On the basis of the present study, and taking into consideration its limitations, the following suggestions are made which may be considered by researcher in future.

(a) Since the difference between different areas have been established through this present study, for calorie intake and other variables affecting nutritional status, physical development and academic achievement; and within group differences were marginal and non-significant; more area specific studies are required to be conducted, in order that micro-level differences pertaining to calorie intake and other associated variables can be critically examined.

(b) Though the present study had taken into consideration four different age groups, in order to highlight upon a developmental sequence
and the differences thereof, the range was not perhaps adequate. Therefore, it calls for a larger range of age to be examined in respect of nutritional status, physical development and academic achievement, in order to establish further facts/variables associated with the growing child.

(c) While the present researcher conducted her study on acceptable small samples and found that the outcomes of the study were not at all affected by the size of the sample; she strongly feels that future studies should be based on larger samples, preferably selected by a stratified random sampling technique, so as to acquire more flexibility in drawing sub-samples for critical analysis.