Chapter - X

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India is home for about 380 million children, the largest number for any country in the world. The nation has a great responsibility to bring up these children, who form nearly 40% of the country's population as responsible and capable citizens.

While each crucial indicator including Infant Mortality Rate, Child Mortality Rate and levels of malnutrition have shown significant improvement, all of these are still considered abnormally high when viewed against the country's capabilities to protect and promote the development of children.

Children are the nation's supremely important asset. Development is the key concern of all nations. It depends to a large degree on the integrated development of children of that country who are its most valuable resources. Early childhood period is crucial in the growth and development of an individual. The foundation of their proper physical, mental, social and psychological developments are laid in early childhood. Damage or impoverishment suffered at this stage is likely to be irreparable.

Good health is necessary for a sound body and mind. Now it is well established that nutrition is able to affect the physical and mental growth of the child. The most alarming factor is that though the physical damage could be remedied later with the supplementation of diet, the damage done to the brain during the pre-school years is most irreversible (Ross, 1954; Rao; 1970 and Barnes et al. 1970).

Nearly one third of world's children suffering from malnutrition are in India (NIPCCD Report - 1999). Of the nearly 12 million children who die each year in developing countries mainly due to preventable causes, the deaths of over 6 million or
55% are either directly or indirectly attributed to malnutrition (UNICEF Report - 1998). About 100 million young children worldwide become blind due to vitamin A deficiency, 226 million children are stunted, shorter than they should be for their age. 67 million children are estimated to be wasted, which means they are below the weight they should be for their height and about 13 million children weigh less than they should be for their age (UNICEF, 1998). More than 2 billion people principally women and children are iron deficient and the World Health Organisation (WHO) has estimated that 51 percent of children under the age of four in developing countries are anaemic.

A close analysis of review of related literature (Chapter III) shows that diets of children are deficient in many important nutrients needed for healthy growth (Devi et al., 1991; Dahiya and Kapoor, 1992; Yadav and Singh, 1999). Lack of knowledge of the needed foods and the special dietary needs of the young children such as the high requirements for proteins during early phase of rapid growth result in malnutrition. In India, prevalence of malnutrition can be attributed to several causes such as poverty, large population, ignorance, traditional beliefs, customs and religious taboos. Malnutrition affect the anthropometric measurements of pre-school children (Sharma and Kalia, 1990; Shrivastava and Kumar, 1995; Aminul Haque et al. 1997).

Malnutrition in early childhood exerts detrimental influence on learning ability and behaviour and probably leads to irreversible mental and emotional damage. Malnutrition often weakens the resistance of a pre-school child to other infections (Schelp, 1990; Lanting, 1996 and Edward et al. ,1996). In India, a number of supplementary feeding programmes have been started. Supplements of protein and calorie rich foods in the diet of children goes a long way in improving the nutritional status of pre-school children (Thaker, 1990; Jayalakshmi, 1992; Abel, 1998). Supplementary feeding programmes improve the mental abilities of children as well (Puri et al. 1983, Choudhry et al. 1984).
The mother who is responsible for family meals has without doubt the most important role in looking after the needs and requirements of the family. The amount of information the meal planner has about nutrition and her attitude towards it will be reflected in the adequacy of the meals. So more education (about nutrition) a woman has, more likely that meals will be adequate and children of these women will be healthier (Abbi et al., 1988; Arya and Devi, 1991; Gupta et al., 1991). Many nutrition and health problems of children can be decreased if proper training and education (in nutrition) is given to the mothers of these children.

Nutrition Education is the process by which beliefs, attitudes and knowledge about food and health are channelised in to actual practices. The Government of India has also given great importance to the under privileged sections of the society. There are various national and International agencies engaged in imparting nutrition education.

Review of literature further shows that not much attempt has been made to educate mothers on Health and Nutrition. Anganwadi workers who impart Health and Nutrition Education are not properly trained and they do not have proper material to conduct formal sessions of Health and Nutrition. Thus, educating mothers by nutrition experts is the need of the hour if we want the well being of children who are our future nation builders. Whatever studies that have been done, in all those studies impact of Health and Nutrition Education of mothers is seen on knowledge and practice gains of mothers. No study has been done in India or abroad to see the impact of Health and Nutrition Education of mothers on subsequent growth and development of their pre-schoolers. So, the investigator was inspired to take up this study on the impact of Health and Nutrition Education of mothers on growth and development of their pre-school children.
STATEMENT OF THE PROBLEM

The problem under study reads as follows:

IMPACT OF IMPARTING HEALTH AND NUTRITION EDUCATION TO MOTHERS ON GROWTH AND DEVELOPMENT OF THEIR PRE-SCHOOL CHILDREN.

OBJECTIVES

1. To measure the anthropometric (Height, Weight, Head Circumference, Arm Circumference and Chest Circumference) gains of pre-schoolers of EG as compared to CG at different levels of Socio-Economic Status and Age.

2. To know the interactions between Health and Nutrition Education (HNE) of mothers, Socio-Economic Status (SES) and Age of pre-schoolers for anthropometric gains.

3. To measure DQ(DQ₁, DQ₂ and DQ_comb) gains of pre-schoolers of EG as compared to CG at different levels of Socio-Economic Status and Age.

4. To know the interactions between Health and Nutrition Education (HNE) of mothers, Socio-Economic Status (SES) and Age of pre-schoolers for DQ(DQ₁, DQ₂ and DQ_comb) gains.

5. To measure skill acquisition (Cognitive and Motor) gains of pre-schoolers of EG as compared to CG at different levels of Socio-Economic Status and Age.

6. To know the interactions between Health and Nutrition Education (HNE) of mothers, Socio-Economic Status (SES) and Age of pre-schoolers for skill acquisition (Cognitive and Motor) gains.
7. To measure Knowledge and Practice gains of mothers of EG as compared to CG at different levels of Socio-Economic Status and Age.

8. To know the interactions between Health and Nutrition Education (HNE) of mothers, Socio-Economic Status and Age of pre-schoolers for Knowledge and Practice gains of mothers.

**HYPOTHESES**

1. There will be significant gains in anthropometric measures (Height, Weight, Head Circumference, Arm Circumference and Chest Circumference) of pre-schoolers of EG as compared to CG at different levels of Socio-Economic Status and Age.

2. There will be significant interactions between Health and Nutrition Education (HNE) of mothers, Socio-Economic Status (SES) and Age of pre-schoolers for anthropometric gains.

3. There will be significant gains in DQ (DQ_1, DQ_2 and DQ_{comb}) of pre-schoolers of EG as compared as CG at different levels of Socio-Economic Status and Age.

4. There will be significant interactions between Health and Nutrition Education (HNE) of mothers, Socio-Economic Status (SES) and Age of pre-schoolers for DQ (DQ_1, DQ_2 and DQ_{comb}) gains of pre-schoolers.

5. There will be significant gains in skill acquisition (Cognitive and Motor) of pre-schoolers of EG as compared to CG at different levels of Socio-Economic Status and Age.
6. There will be significant interactions between Health and Nutrition Education (HNE) of mothers, Socio-Economic Status (SES) and Age of pre-schoolers for skill acquisition (Cognitive and Motor) gains.

7. There will be significant differences in Knowledge and Practice gains of mothers of EG as compared to CG at different levels of Socio-Economic Status and Age of pre-schoolers.

8. There will be significant interactions between Health and Nutrition Education (HNE) of mothers, Socio-Economic Status (SES) and Age of pre-schoolers for Knowledge and Practice gains of mothers.

DELIMITATIONS OF THE STUDY

1. The study was limited to measuring the growth and development of pre-school children with age range of 2 to 5 years belonging to SESh and SESl of Ambala City.

2. The study was limited to measuring the growth of pre-schoolers only for eighteen months.

3. The study was limited to measuring of only few parameters of growth.

4. The study was limited to teaching of few concepts of Health and Nutrition to the mothers only for one week and repeating it twice after six months interval.

DESIGN

In the present study experimental - control group, pre-post test 2x2x3 factorial design was used. The independent variables in the present study were Health and Nutrition Education (HNE) of mothers, Socio-Economic Status (SES) and Age of pre-
school children. Dependent variables were Height, Weight, Head-Circumference, Arm-
Circumference, Chest Circumference, DQ₁(on DST), DQ₂(on VSMS), DQ_{comb} (Average 
of DQ₁ and DQ₂) Cognitive Skills & Motor Skills of pre-school children, Knowledge and 
Practices of mothers. Treatment variable of Health and Nutrition Education(HNE) was 
studied at two levels i.e. Control (CG) and Experimental Group (EG). Socio-Economic 
Status(SES) was also studied at two levels i.e. High SES (SES_H) and Low SES(SES_L). 
Age of children was studied at three levels i.e 2-3 years, 3-4 years & 4-5 years. The 
layout of the factorial design used in the present study is given in Figure 4.1. The total 
number of combinations, come out to be 2x2x3 = 12 as shown in Figure 4.2.

Out of the twelve groups, six groups were of experimental mothers and six groups 
were of control mothers. The Knowledge and Practices of all the twelve groups of 
mothers were assessed before and after imparting them Health and Nutrition Education. 
Six experimental groups were imparted Health and Nutrition Education, Anthropometric 
Measurements, DQ₁, DQ₂, DQ_{comb} scores, Cognitive and Motor Skill scores of all the 
pre-schoolers were also taken before and after imparting Health and Nutrition Education 
to their mothers. There were three Post Tests. Post Test I was conducted six months 
after the training of mothers. After Post Test I, mothers were again taught the same 
facts about Health and Nutrition for one day for two hours. Post Test II was conducted 
twelve months after the first training of mothers. After Post Test II, experimental mothers 
were once again given revision of what was taught to them six and twelve months ago. 
Post Test III was conducted eighteen months after the first training of mothers. Pictorial 
form of the design of the present study is represented in Figure 4.3.

The present design of the study was such that Health and Nutrition Education 
(HNE) of mothers was the major variable between the control and experimental groups. All 
other variables such as socio economic status, age, sex, living conditions and the schools
they attended were the same for control and the experimental groups. Hence the observations were expected to provide an impact of Health and Nutrition Education of mothers.

**SAMPLE**

To conduct the present study, a sample of 600 mothers and their pre school children belonging to different socio economic levels and different age groups were randomly selected from different schools of Ambala city. Out of the sample of 600, 300 were the mothers and 300 were their pre school children. But after eighteen months only 240 children were available for the impact study. Those who were available for six months or twelve months were not taken for the impact study. Thus in the final sample, there were 240 pre school children and 240 were their mothers. (Total = 480). Out of the sample of 240 mothers, 120 formed an EG and 120 formed a CG. Out of the sample of 120 mothers, 60 mothers were from High SES and 60 mothers were from Low SES. Out of the sample of 60 mothers of High SES, 20 mothers had children of 2 to 3 years age, 20 mothers had children of 3 to 4 years age and 20 mothers had children of 4 to 5 years age. Out of the sample of 60 mothers of Low SES, 20 mothers had children of 2 to 3 years, 20 mothers had children of 3 to 4 years and 20 mothers had children of 4 to 5 years. Similarly out of the sample of 240 pre school children, 120 formed an EG and 120 formed a CG. Out of this 120 pre schoolers, 60 children were from High SES and 60 children were from Low SES. Out of the sample of 60 children of High SES, 20 children were of 2 to 3 years of age, 20 children were of 3 to 4 years age and 20 children were of 4 to 5 years age. Out of the sample of 60 children of Low SES, 20 children were of 2 to 3 years age, 20 children were of 3 to 4 years age and 20 children were of 4 to 5 years age. Figurical representation of the final sample has been shown in Figure 4.4.
TOOLS USED

For the purpose of proposed study, the following tools were used:

1. Body measurements were recorded using the technique described by Jellieffe (1966)
2. Developments Screening Test (DST) by Bharath raj (1977)
3. Vineland Social Maturity Scale (VSMS) Nagpur adaptation by Malin.
6. Questionnaire prepared by the investigator.

PROCEDURE OF DATA COLLECTION

The data of the present study was collected in the following phases:

Phase I - Identification of mothers and their pre-school children.

In the first phase of data collection, mothers and their pre-school children (2 to 5 years) were identified from different schools of Ambala City. Socio Economic Status of mothers and children were judged by administering SES scale urban by Kuppuswamy (1981).

Phase II - Pre Test Period

In the second phase, Pre Test was done by administering questionnaire
(prepared by the investigator) to all the groups of mothers to test their initial Knowledge, 
and Practices on Health and Nutrition. The questionnaire was administered by the 
investigator personally on each mother. The investigator took the help of trained assistants 
for data collection. Proper instructions were given to the assistants and made sure that 
subject understands the question clearly and gives correct response. The subjects were 
open to ask any question for the clarification of doubts and it was fully explained to 
them.

Anthropometric measurements (Height, Weight, Head Circumference, Arm 
Circumference and Chest Circumference of all pre-schoolers) were recorded by a 
technique as described by Jellieffe. For measuring intelligence, Developmental 
Screening Test (DST) by Bharathraja(1977) was administered individually by the 
investigator on all the preschool children. The maximum behavioural items that a child 
should do were calculated as per their chronological age. Developmental Age(DA) of 
the child was calculated by the formula

\[ DA = \frac{C.A}{\text{Behavioural items a child could actually do}} \times \text{Behavioural items a child should do} \]

Developmental Age(DA) of each child was then converted into Developmental Quotient 
(DQ) by using the formula.

\[ DQ = \frac{DA}{C.A} \times 100 \]

In order to assess Social Age(SA) of all preschool children, Vineland Social 
Maturity Scale adapted by Malin(1965) was used. Here also the maximum behavioural
items that a child should do were calculated as per their chronological age. Social Age (SA) of the child was calculated by the formula:

$$SA = \frac{C.A. \times \text{Behavioural items a child could actually do.}}{\text{Behavioural items a child should do}}$$

Social Age (SA) of each child was then converted into Social Quotient (SQ) by using the formula:

$$SQ = \frac{SA}{C.A} \times 100$$

In the present study, DQ obtained from DST and SQ obtained from VSMS were hereafter called as DQ\textsubscript{1} and DQ\textsubscript{2} respectively. DQ\textsubscript{comb} of each child was computed by averaging DQ\textsubscript{1} and DQ\textsubscript{2}. DQ\textsubscript{comb} was obtained for each child.

Cognitive abilities and Motor skills of pre-school children were judged by administering checklists from Portage Kit (Indian Adaptation by Kohli, 1992). The maximum behaviour items a child should do on Cognitive and Motor Check List were calculated as per their chronological age. Cognitive and Motor scores were calculated in the similar way as DQ\textsubscript{1} and DQ\textsubscript{2}.

Phase III - Training Period

In the third phase, Health and Nutrition Education was given to the mothers of only EG by the investigator herself. Each group was given education for one hour daily for one week. Subject matter for giving Health and Nutrition Education was prepared by the investigator. It included constituents of food, balanced diet, deficiency diseases in children, personal, food and environmental hygiene and preparation of low cost nutritious food for pre-schools children. No education was given to the mothers of the CG.
Phase IV  Post Test I

In the fourth phase, Post Test I was conducted on all the mothers and pre school children (Experimental and Control) six months after the education. In this post test, gain in anthropometric measurements, DQ scores, Cognitive and Motor Skill scores of pre-schoolers, Knowledge and Practices of mothers were noted by administering same tests which were administered at the time of Pre Test.

Phase V  Revision Period I

In the fifth phase, all that was taught to the mothers of EG, on Health and Nutrition was revised after the Post Test I. Revision was done for one day for two hours only. CG were not given any revision.

Phase VI  Post Test II

Post Test II was conducted on all the mothers and pre school children (experimental and control) after twelve months of first training period. In this Post Test also gain in Knowledge and Practice of mothers on Health and Nutrition, gain in Anthropometric measurements, DQ scores, Cognitive and Motor skill scores of pre school children were noted by administering same tests which were administered at the time of Pre-Test.

Phase VII  Revision Period II

In the seventh phase, after the Post Test II, again the same facts on Health and Nutrition were revised with the mothers of EG for one day for two hours only. This revision was done so that they donot forget what was taught to them twelve months ago.
Phase VIII  Post Test III

In the last phase, Post Test III was conducted on all the mothers and pre school children (Experimental and Control) after eighteen months of first training period. Once again, gain in Knowledge and Practices of mothers on Health and Nutrition, gain in anthropometric measurements and DQ scores of pre schoolers were noted by administering same tests which were administered at the time of Pre-Test.

STATISTICAL ANALYSIS

Various statistical techniques were applied for testing research hypotheses. A brief description of these techniques is made here as following :-

(1) Raw scores of DST and VSM were converted into DQ1 and DQ2 respectively so as to obtain average of combined DQs(DQcomb).

(2) Descriptive statistics namely, Mean, Median, SD, Skewness and Kurtosis of Pre-Test scores for total sample and individual groups were obtained.

(3) Analysis of variance, 2x2x3 factorial design for equal cell frequencies on gain scores of all the twelve variables was applied to know the main effects and interactive effects.

(4) Significance of difference between means was arrived at by 't' test.

(5) Graphic representation was done wherever necessary.
RESULTS

Results obtained in the present study can be categorized as follows:-

**Impact on Physical Growth of pre schoolers**

- No significant differences were found in Height, Weight, Head Circumference and Chest Circumference scores of EG and CG at Pre Test.

- EG had more Height, Weight, Head Circumference, Arm Circumference and Chest Circumference gains as compared to CG at Post Test I, Post Test II and Post Test III.

- SES children had more Height, Weight, Arm Circumference and Chest Circumference gains than SES children at Post Test I and Post Test II. No significant differences were found in Head Circumference gains of SES and SES children at Post Test I and Post Test II.

- At Post Test III, significant differences were found in Height, Weight, Head Circumference, Arm Circumference and Chest Circumference gains of SES and SES children. The increment rate of SES children was higher as compared to SES children.

- At Post Test I, no significant differences were found in Height, Weight, Head Circumference and Chest Circumference gains of children of 2-3 years, 3-4 years and 4-5 years. Significant differences were found in Arm Circumference gains of children of three age groups. Maximum Arm Circumference gains was found in children of 2-3 years.

- At Post II, no significant difference were found in Height, Weight and Head Circumference gains of three age groups. Significant differences were found in Arm Circumference and Chest Circumference gains of children of three age groups.
Maximum Arm Circumference gain was found in children of 2-3 years and maximum Chest Circumference gain was found in children of 4-5 years.

- At Post Test III, no significant differences were found in Height and Weight gains of children of three age groups. Significant differences were found in Head Circumference, Arm Circumference and Chest Circumference gains of three age groups. Maximum Head Circumference and Arm Circumference gains were found in children of 2-3 years but maximum Chest Circumference gain was found in children of 4-5 years.

- No significant differences were found in Height, Weight, Head Circumference, Arm Circumference and Chest Circumference gains of EG and CG of SES_h and SES_i at Post Test I, Post Test II and Post Test III.

- No significant difference were found in Height, Weight, Head Circumference, Arm Circumference and Chest Circumference gains of children of three age groups belonging to SES_h and SES_i at Post Test I, Post Test II and Post III.

- No significant differences were found in Height, Weight, Head Circumference, Arm Circumference and Chest Circumference gains of EG and CG of three age groups at Post Test I, Post Test II and Post Test III.

- No significant differences were found in Height, Weight, Head Circumference, Arm Circumference and Chest Circumference gains of EG and CG of three age groups belonging to SES_h and SES_i at Post Test I, Post Test II and Post Test III.

**Impact on Mental Growth of pre-schoolers**

- There were no significant differences in DQ_1, DQ_2 and DQ_comb scores of EG and CG at Pre Test.
- DQ₁, DQ₂ and DQ\textsubscript{comb} gains were more in EG\textsubscript{s} as compared to CG\textsubscript{s} at Post Test I, Post Test II and Post Test III.

- At Post Test I, significant differences were observed in DQ₁ and DQ\textsubscript{comb} gains of SES\textsubscript{h} and SES\textsubscript{l} children but no significant differences were observed in DQ₂ gains of SES\textsubscript{h} and SES\textsubscript{l} children.

- At Post II and Post Test III, no significant differences were observed in DQ₁, DQ₂ and DQ\textsubscript{comb} gains of SES\textsubscript{h} and SES\textsubscript{l} children.

- No significant differences were found in DQ₁ and DQ₂ gains of children of three age groups at Post Test I. But significant differences were found in DQ\textsubscript{comb} gains of children of three age groups.

- Significant differences were found in DQ₁, DQ₂ and DQ\textsubscript{comb} gains of children of three age groups at Post Test II and Post Test III.

- 4-5 years children had more DQ₁, DQ₂ and DQ\textsubscript{comb} gains than 2-3 years and 3-4 years. 3-4 years children had more DQ₁, DQ₂ and DQ\textsubscript{comb} gains than 2-3 years children.

- At Post Test I and Post Test II, no significant differences were found in DQ₁, DQ₂ and DQ\textsubscript{comb} gains of EG\textsubscript{s} and CG\textsubscript{s} of SES\textsubscript{h} and SES\textsubscript{l} children. But at Post Test III, significant differences were found in DQ₁, DQ₂ and DQ\textsubscript{comb} gains of EG\textsubscript{s} and CG\textsubscript{s} of SES\textsubscript{h} and SES\textsubscript{l} children.

- At Post III, EG\textsubscript{h} gained over CG\textsubscript{h} in DQ₁, DQ₂ and DQ\textsubscript{comb} scores. Similarly EG\textsubscript{l} gained over CG\textsubscript{l} in DQ₁, DQ₂ and DQ\textsubscript{comb} scores. EG\textsubscript{h} gained over EG\textsubscript{l} in DQ₁, DQ₂ and DQ\textsubscript{comb} gains.
No significant differences were observed in DQ₁, DQ₂ and DQ₃ gains of children of three age groups belonging to SESₕ and SESₗ at Post Test I and Post Test II. But at Post Test III, significant differences were observed in DQ₃ gains of children of three age groups belonging to SESₕ and SESₗ.

At Post Test III, SESₕ (4-5 years) had more DQ₃ gains than SESₕ (2-3 years) and SESₕ (3-4 years). Similarly SESₗ (4-5 years) had more DQ₃ gains than SESₗ (2-3 years) and SESₗ (3-4 years).

SESₕ (2-3 years) had more DQ₃ gains than SESₗ (2-3 years). SESₗ (3-4 years) had more DQ₃ gains than SESₗ (3-4 years). Similarly SESₗ (4-5 years) had more DQ₃ gains than SESₕ (4-5 years).

No significant differences were observed in DQ₁ and DQ₂ gains of EGₖ and CGₖ of different age groups at Post Test I. But in DQ₃ gains, differences were significant among them at Post Test I.

At Post II and Post Test III, significant differences were observed in DQ₁, DQ₂ and DQ₃ gains of EGₖ and CGₖ of different age groups.

At Post Test I, EG (4-5 years) had more DQ₃ gains than EG (2-3 years) and EG (3-4 years). Similarly CG (4-5 years) had more DQ₃ gains than CG (2-3 years) and CG (3-4 years).

EG (2-3 years) had more DQ₃ gains than CG (2-3 years). Similarly EG (3-4 years) had more mean DQ₃ gains than CG (3-4 years) and EG (4-5 years) had more DQ₃ gains than CG (4-5 years).

No significant differences were found in DQ₁, DQ₂ and DQ₃ gains of EGₖ and CGₖ of three age groups belonging to SESₕ and SESₗ at Post Test I and Post Test II.
At Post Test III, significant differences were observed in $E_{G_1}$ and $C_{G_2}$ of three age groups belonging to $S_{E_{Sh}}$ and $S_{E_{Sh}}$ in $D_{Q_1}$ and $D_{Q_{comb}}$ gains but no significant differences were observed in $D_{Q_2}$ gains.

- Significant differences were observed in $D_{Q_1}$ and $D_{Q_{comb}}$ gains of $E_{G_1}$ and $E_{G_2}$, $E_{G_1}$ and $E_{G_3}$, $E_{G_2}$ and $E_{G_3}$ at Post Test III.

- Significant differences were observed in $D_{Q_1}$ and $D_{Q_{comb}}$ gains of $E_{G_1}$ and $E_{G_4}$, $E_{G_2}$ and $E_{G_5}$, $E_{G_3}$ and $E_{G_6}$ at Post Test III.

- Maximum $D_{Q_1}$ and $D_{Q_{comb}}$ gains were observed in $E_{G_6}$ and minimum in $C_{G_4}$ at Post Test III.

**Impact on Skill Acquisition (Cognitive and Motor) of pre-schoolers.**

- There were no significant differences in Cognitive and Motor Skill scores of $E_{G_1}$ and $C_{G_4}$ at Pre-Test.

- $E_{G_1}$ had more Cognitive and Motor Skill gains as compared to $C_{G_4}$ at Post Test I and Post Test II.

- There were no significant differences in Cognitive Skill gains of $S_{E_{Sh}}$ and $S_{E_{Sh}}$ children at Post Test I. But there were significant differences in Motor Skill gains of $S_{E_{Sh}}$ and $S_{E_{Sh}}$ children at Post Test I. $S_{E_{Sh}}$ children had more Motor Skill gains than $S_{E_{Sh}}$ children.

- At Post Test II, significant differences were observed in Cognitive and Motor Skill gains of $S_{E_{Sh}}$ and $S_{E_{Sh}}$ children. $S_{E_{Sh}}$ had more Cognitive and Motor Skill gains than $S_{E_{Sh}}$ children.
- There were no significant differences in Cognitive and Motor Skill gains of children of three age groups at Post Test I.

- At Post Test II, significant differences were observed in Cognitive and Motor Skill gains of children of three age groups. 4-5 years children had more Cognitive and Motor Skill gains than 2-3 years and 3-4 years.

- No significant differences were found in Cognitive and Motor Skill gains of EG_s and CG_s of SES_h and SES_i at Post Test I and Post Test II.

- No significant differences were found in Cognitive and Motor Skill gains of children of three age groups belonging to SES_h and SES_i children at Post Test I and Post Test II.

- No significant differences were observed in Cognitive and Motor Skill gains of EG_s and CG_s of various age groups at Post Test I, Post Test II and Post Test III.

- No significant differences were observed in Cognitive and Motor Skill gains of EG_s and CG_s of three age groups belonging to SES_h and SES_i at Post Test I and Post Test II.

**Impact on Knowledge and Practices of mothers.**

- There were no significant differences in Knowledge and Practice scores of mothers at Pre-Test.

- EG_s had more mean Knowledge and Practice gains than CG_s at Post Test I, Post Test II and Post Test III.

- Significant differences were found in Knowledge gains of SES_h and SES_i mothers at Post Test I, Post Test II and Post Test III. SES_h mothers had more Knowledge gains than SES_i mothers at all Post Tests.
- No significant differences were found in Practice gains of \( S E S_h \) and \( S E S_i \) mothers at Post Test I.

- At Post Test II and Post Test III, significant differences were found in Practice gains of \( S E S_h \) and \( S E S_i \) mothers. \( S E S_i \) mothers had more Practice gains than \( S E S_h \) mothers.

- No significant differences were observed in Knowledge and Practice gains of mothers having children of different age groups at Post Test I, Post Test II and Post Test III.

- Significant differences were found in Knowledge gains of \( E G_x \) and \( C G_y \) belonging to \( S E S_h \) and \( S E S_i \), at Post Test I, Post II and Post Test III. But for Practice gains, no significant differences were observed in \( E G_x \) and \( C G_y \) of \( S E S_h \) and \( S E S_i \) mothers at Post Test I but at Post II and Post Test III, significant differences were observed in Practice gains among them.

- \( E G_h \) had more Knowledge gains than \( E G_i \) at Post Test I, Post Test II and Post Test III. But for Practice gains, \( E G_i \) had more gains than \( E G_h \) at Post Test II and Post Test III.

- \( E G_h \) had more Knowledge and Practice gains than \( C G_i \) at Post Test I, Post Test II and Post Test III. Similarly \( E G_i \) had more Knowledge and Practice gains than \( C G_i \) at all the three Post Tests.

- \( C G_h \) had more Knowledge and Practice gains than \( C G_i \) at Post Test I, Post Test II and Post Test III.

- No significant differences were observed in Knowledge and Practice gains of mothers having children of different age groups belonging to \( S E S_h \) and \( S E S_i \) at Post Test I, Post Test II and Post Test III.
- No significant differences were observed in Knowledge and Practice gains of EG and CGS having children of different age groups at Post Test I, Post Test II and Post Test III.

- No significant differences were observed in Knowledge and Practice gains of EG and CGS having children of various age groups belonging to SES<sub>h</sub> and SES<sub>i</sub> at Post Test I, Post Test II and Post Test III.

CONCLUSIONS

In the light of findings of the present study, the following major conclusions can be drawn.

- Health and Nutrition education given to mothers has significant positive effect on Height, Weight, Head Circumference, Arm Circumference and Chest Circumference gains of pre-school children.

- SES<sub>h</sub> children have more Height, Weight, Head Circumference, Arm Circumference and Chest Circumference gains than SES<sub>i</sub> children.

- No significant differences are found in Height & Weight gains of children of 2-3 years, 3-4 years and 4-5 years.

- Maximum Head Circumference and Arm Circumference gain is found in children of 2-3 years but maximum Chest Circumference gain is found in children of 4-5 years.

- No significant interactions are there between HNE of mothers, SES and Age of children for anthropometric gains of children.

- Relationship of nutrition and mental growth is once again established. We can improve upon the mental abilities of children by educating mothers on Health and Nutrition. Health and Nutrition Education imparted to mothers has significant effect on DQ gains of children.
- SES₁ children also have the same potential of mental growth as SESₗ children have, if good nutrition and proper environment is given to them.

- At the initial stage, SESₗ children gain more DQ scores than SES₁ children but when their deficiencies are overcome with proper nutrition, SES₁ children gain more DQ scores than SESₗ children.

- 4-5 years children gain more DQ scores as compared to 2-3 years and 3-4 years children. Rate of mental development increases as the age increases.

- There are significant positive Interactions between HNE of mothers, SES and Age of children for DQ gains of children after twelve and eighteen months.

- Health and Nutrition education given to mothers has positive effect on Cognitive and Motor Skill gains of children.

- SESₗ children have more Cognitive and Motor Skill gains than SES₁ children.

- Significant differences are there in Cognitive and Motor Skill gains of children of 2-3 years, 3-4 years and 4-5 years after twelve months. 4-5 years children have more Cognitive and Motor Skill gains than 2-3 years and 3-4 years.

- There are no interactions between HNE of mothers, SES and Age of children for Cognitive and Motor Skill gains of children.

- Health and Nutrition education given to mothers has positive effect on Knowledge and Practice gains of mothers.

- SESₗ mothers have more Knowledge gains than SES₁ mothers. But when Health and Nutrition education is repeatedly given to mothers, SES₁ mothers have more Practice gains than SESₗ mothers after twelve and eighteen months.

- Age of children has no effect on Knowledge and Practice gains of mothers.
- There is significant interaction between HNE and SES for Knowledge and Practice gains of mothers but there is no interaction between SES and Age of children, HNE of mothers and Age of children, HNE of mothers, SES and Age of children.

**Educational Implications**

The research confirms the indispensability of educating mothers on Health and Nutrition especially in the view of pivotal role mother plays in feeding children who are our future capable citizens. The research therefore, includes following educational implications.

- Arranging repeated Health and Nutrition Programmes for mothers by Nutrition Experts.

- Training Anganwadi workers to educate mothers on Health and Nutrition.

- Giving more stress on Health and Nutrition education of mothers instead of supplementary feeding programmes.

- Devising new and interesting methods to educate mothers on Health and Nutrition.

- Preparing simplified content for Health and Nutrition Programmes in local languages.

- Preparing well illustrated teaching aids for Health and Nutritions Programmes.

**Suggestions for further Research Work**

(1) Longer time period should be taken to measure the growth of children.

(2) Health and Nutrition Education programme should be conducted for at least two weeks or more and repetitions should be done at intervals of three months.
(3) Impact of Health and Nutrition Education of mothers on psychosocial development, language development and emotional development can be studied.

(4) Impact of Nutrition education of mothers on growth and development of pre-school children in rural and urban areas can be compared.