CHAPTER-III

METHODOLOGY

Methodology pertaining to the study on “Impact of Strengthening the ICDS Adolescent Nutrition and Health Education Component and Its Delivery” is discussed under the following headings:

3.1 Type of the Study
3.2 Objectives of the Study
3.3 Formulation of Hypothesis
3.4 Definitions of the Terms Used
3.5 Method of Study
3.6 Selection of Samples
3.7 Sources of Data
3.8 Tools Used for Data Collection
3.9 Conduct of the Study
3.10 Statistical Analysis of Data
3.11 Limitations of the Study

3.1. Type of the study

The present study is said to be an action research. An action research can either be applied research or fundamental. Since the study is a process by which the investigator attempts to find a solution to an immediate problem with a view to make generalizations for a social problem. In other words, it is a process to study the problems scientifically in order to guide, correct, and evaluate their decisions and actions’ is called action research (Kothari, 2003).
3.2. Objectives of the study

The overall objective of the study is to evaluate the implementation of NHEd in ICDS programme with focus on delivery system and its impact on beneficiaries and to suggest measures for making the programme more effective to the target group.

The specific objectives of the study are to

1. assess the nutrition and health knowledge levels of Anganwadi workers in ICDS, before and after intervention.
2. study the influence of socio-economic and demographic factors on the knowledge level of the Anganwadi workers.
3. identify the inadequacies in the delivery of adolescent nutrition and health education component of ICDS.
4. assess the nutrition and health knowledge, attitude and practice and nutritional status of the adolescent beneficiaries before and after intervention.
5. design and implement a suitable nutrition and health education intervention programme.
6. identify the areas of improvement due to the intervention programme.

3.3. Hypothesis of the study

On the basis of the above objectives, the following hypotheses have been formulated.

1. The socio- economic and demographic factors would not influence the knowledge of Anganwadi workers towards nutrition and health.
2. Intervention programme would bring positive impact on the nutrition and health knowledge levels of the Anganwadi workers.

3. Intervention programme would bring positive impact on nutrition and health knowledge, attitude and practice of the adolescent respondents.

3.4. Definitions of the terms used

**Impact** - In this study, the impact is defined as the difference brought about by an intervention programme on the nutrition and health knowledge of the Anganwadi workers, and nutrition and health knowledge, attitude, practice, nutrition and health status of the adolescent beneficiaries.

**Strengthening**- means “improving the nutrition and health knowledge by implementing an intervention programme based on the weaker components in the NHEd”.

**Delivery** - In this study, it implies the frequency, duration, method and teaching aids used for conducting NHEd.

**ICDS**- ICDS is the shortened form of Integrated Child Development Services.

**NHEd** - NHEd is the shortened form of Nutrition and Health Education.

3.5. Area of the study

The present study has been carried out in Athoor Block in Dindigul district of Tamil Nadu, which comprises 14 blocks. Athoor Block is one among them and it has been selected for the study. There are 153 ICDS in Athoor block, among them 100 have been selected for the study.

The reason for choosing this study area was that the area was easily reachable by availing public transport facilities by the investigator which facilitated her to have in depth as well as wider study in this area.
Description of the study area

<table>
<thead>
<tr>
<th>Block</th>
<th>Athoor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from the Head Quarters (Dindigul)</td>
<td>15 kms</td>
</tr>
<tr>
<td>Number of gram panchayats</td>
<td>22</td>
</tr>
<tr>
<td>Number of town panchayats</td>
<td>3</td>
</tr>
<tr>
<td>Total number of villages (villages and hamlets) in Athoor Block</td>
<td>109</td>
</tr>
<tr>
<td>Number of ICDS centres in this block</td>
<td>146</td>
</tr>
<tr>
<td>Number of ICDS centres studied</td>
<td>100</td>
</tr>
<tr>
<td>Total samples (Anganwadi workers)</td>
<td>100</td>
</tr>
</tbody>
</table>

3.6. Samples of the study

In order to study the delivery system of ICDS Adolescent Nutrition and Heath Component, totally 450 samples were selected for the study. Among the 450 samples, one hundred were Anganwadi workers and three hundred and fifty were adolescent beneficiaries of the scheme.

The Anganwadi workers are responsible for delivering the Nutrition and Health Education to the beneficiaries. Adolescent girls are the beneficiaries of the ICDS adolescent scheme. Each Anganwadi worker has 10-15 adolescent beneficiaries in the age range of 11-18 years. There are 1258 adolescent beneficiaries. By simple random method four adolescent beneficiaries were selected from each of the Anganwadi workers. Only three hundred and fifty respondents were formed as the final sample. Nearly fifty respondents dropped out from the study due to migration and the researcher could not met them during the post - survey.

Hence, the study constituted totally one hundred Anganwadi workers and three hundred and fifty adolescent beneficiaries.
DESIGN OF THE STUDY: A BIRDS EYE VIEW

STUDY AREA: ATHOOR BLOCK OF DIN DIGUL DISTRICT

SAMPLES: ♦ Anganwadi Workers (N = 100)
♦ Adolescent Beneficiaries (N = 350)

TOOLS USED: ♦ Interview Schedule – I
♦ Interview Schedule – II

First Phase: Baseline Survey from the Selected Samples

Second Phase: Execution of Education Intervention Programme

Education Intervention

Investigator
(3 months)

Anganwadi Workers
(10 months)

Anganwadi Workers

Adolescent Beneficiaries

Third Phase: Evaluation of Education Intervention Programme

Anganwadi Workers

♦ Knowledge
♦ Use of teaching methods and aids
♦ Increased duration and frequency

Adolescent Beneficiaries

♦ Knowledge
♦ Attitude
♦ Practice
♦ Nutritional Status

65
3.7. Sources of Data

The present study was based on primary data collected from the field situation. Basotia and Sharma (2002) have stated that the primary sources are those from which information is gathered by the researcher. The sources of such information are the individuals and the incidents around them. Generally, primary information is gathered through direct information by observation, schedule, and interview method. In the present study, primarily the data were collected from the Anganwadi workers. As the study was on adolescent scheme, it would be more valid to study the impact of nutrition and health education programme on the beneficiaries. Therefore, the adolescent beneficiaries were also included for the study in order to ascertain whether they were benefited from the programme with regard to the nutrition and health point of views. Both these groups formed the source of data.

3.8. Tools Used for Data Collection

The tools used for the present study were interview schedules. Two separate tools were constructed in the regional language to elicit information from the Anganwadi workers and from the adolescent beneficiaries.

3.8.1. Interview Schedule -1

This was administered to collect data from the Anganwadi workers. The Interview Schedule - I used for this research study consisted of three sub-divisions.

The first sub-division contains items for collecting the socio-economic profile of the workers, which included age, religion, caste, family size and type, family income, marital status, educational qualification, and length of experience.
The second sub-division of the schedule consisted of the details regarding the delivery of nutrition and health education package.

The third sub-division of the schedule was the knowledge assessment tool. The knowledge assessment formed the final part of both schedules I and II and a similar set of questions were given to both the groups.

3.8.2 Interview Schedule - II

For collecting data from the Adolescent beneficiaries Interview schedule - II was used. It consists of four sub divisions.

The first sub-division contains items for collecting the socio-economic profile of the adolescent beneficiaries, which included the age, educational status, caste, religion, family type and size, birth order and monthly income of the family’s of the respondents.

The second division consists of assessment of the nutritional status of the selected adolescent respondents.

3.8.2.1 Assessment of Nutritional Status

Assessment of Nutritional Status of a community is one of the first step in the formulation of any public health strategy to combat malnutrition. The nutritional assessment organizes and evaluates the information gathered to make a professional judgment about nutritional status (ASPEN, 2002). Nutritional status can be assessed by the following methods and these methods have been employed in the present study.

i. Anthropometry

ii. Bio chemical examination

iii. Clinical Examination

iv. Dietary Assessment
i. Anthropometry

Anthropometry is measurement of human body at various ages and levels of nutritional status. It is based on the concept that an appropriate measurement should reflect any morphological variation occurring due to a significant functional physiological change (Rao, 2000). For the present study, Anthropometric measurements such as height and weight were taken for the selected adolescent respondents to categorize as normal, overweight, and obese.

a. Height

The height of an individual is principally a measure of skeletal bone tissue. The measurement of height is a routine practice for the assessment of nutritional status (Samraj, 1997). Height was measured using a measuring tape. The respondent was made to stand up as straight as possible and heels touching the wall. A wooden scale was placed gently on the head perpendicular to the walls. The height was thus recorded in centimeters.

b. Weight

Weight is another measure that is easy to obtain. Weight also provides a crude evaluation of overall fat and muscle stores (Hopkins, 1993).

Bathroom scale was used to measure body weight. The balance was adjusted to zero and the reading was noted. The respondents were made to stand bare foot and erect and readings were made to the nearest 0.1 kg.

c. Body Mass Index (BMI)

BMI is a valid measure of nutritional status. The Quetlet’s index, the most widely used height _ weight index is commonly referred to as BMI. It has a high correlation with adiposity, but it does not quantify total body adiposing or convey information concerning regional fat distribution.
(Van and Hubbard, 2000). BMI can be calculated from the recorded measurements of weight (Kg) and height (M) using the formula given by Garrow (2000).

\[
\text{BMI} = \frac{\text{Weight (Kg)}}{\text{Height (m}^2)}
\]

ii. Biochemical Examination

Biochemical tests help to diagnose deficiencies and diseases at the sub clinical stage and confirm it as a diseases state (Bert, 1998). For the present study, Haemoglobin estimation was carried out for 100 sub samples before and after intervention. Haemoglobin level in the blood was estimated by Cyanmethaemoglobin method, which was accepted as the best method for field situation. The Haemoglobin values of the respondents were compared with WHO (1968) values and categorized as normal, mild, moderate and severely anaemic.

iii. Clinical Examinations

Clinical examination is the most important part of nutritional assessment and remains a widely utilized practical direct method for assessment of nutritional status of individual and community (Jelliffe and Jelliffe, 1991). It is relatively simple in community situation. It does not call for sophisticated equipment and helps to reveal the anatomical changes that occur in the body and observed by naked eye. In order to know whether the respondents were healthy and free from deficiency symptoms, clinical assessment was done for all the respondents by the investigator and the observations were recorded.
iv. Dietary Assessment

Thimmayama (1987) states that the value of nutritional assessment is greatly enhanced when it is supplemented by a dietary survey. Diet survey was performed using the 24-hour Food Recall Method. This method is widely used and considered as the most reliable method to assess the diet pattern of the adolescent girls.

24 Hour Food Recall Method

In this method, a trained professional asks the respondents to describe the kinds and amounts of food consumed during the previous 24 hours. Those interviewed are often given food models, cups, glasses and bowls of various sizes to estimate the portion size (Guthrie, 1989). The twenty-four hour dietary recall provides data for one day only and is commonly used in nutrition surveys to obtain estimates of the typical food intakes of a large number of people in given populations. The assessor asks the client to recollect everything eaten or drunk in the past twenty-four hour or the previous day. Through this method, the previous day menu was collected from the respondents and analysed for the nutrient intake. The values were compared with Recommended Dietary Allowance (RDA) for Indians using ICMR Nutritive value of Indian foods (Gopalan, et al, 2004).

The fourth part of the schedule consists of an assessment of knowledge, attitude and practice of the respondents regarding nutrition and health aspects. The knowledge assessment instrument was used to assess the nutrition knowledge level of the Anganwadi workers and the adolescent beneficiaries.
ASSESSMENT OF NUTRITIONAL STATUS
PLATE I
3.8.2.2. Construction of Knowledge Assessment Test

Nutrition and Health Education provided by the Anganwadi workers comprises six nutrition and health topics and other life-skill oriented topics, it became necessary to identify the areas that could be included in the test to be constructed. The core content of NHEd topics was examined and the sub topics related to nutrition and health were identified and finally the following topics were included in the tool. One hundred questions were included in the form of open-ended questions. The topics were on

1. Physiological Changes during Adolescence
2. Nutritional Care during Pregnancy and Lactation
3. Breast feeding and Weaning foods
4. Iron Deficiency Anaemia
5. Iodine Deficiency Disorder
6. Vitamin A Deficiency
7. Growth Monitoring and Immunization
8. Diarrhoea
9. Personal Hygiene and
10. Environmental Sanitation

For each correct response one score was given and the total score obtained for all the items in the questions formed the knowledge score for each respondents. The maximum score to be obtained was 100.

The knowledge assessment instrument was pre-tested with the other sets of school going students and Anganwadi workers to establish clarity of the questions, appropriate language level and comprehension level of the questions.
3.8.23. Development of Attitude Scale to measure attitudes towards Nutrition and Health

An attitude scale was intended to measure the attitude of the respondents towards nutrition and health. The procedure adopted for preparing the attitude scale was different from the general methodology used for preparing the rest of the instrument. The first step in developing the scale was to collect a set of statements in such a way that the acceptance or rejection of each one would imply a different degree of favourable or unfavourable attitude. The items included in this were picked up from the NHEd topics. Though many attitude scales developed in this field by many experts, none of them found suitable as it tend to measure the attitude of the beneficiaries under the NHEd programme. The investigator developed about 50 statements. All the statements represented were factual towards the issue. Against each statement three alternative responses namely, Agree (A), Uncertain (U), Disagree (DA) were given. It was pre tested for clarity. From this preliminary tryout, statements that found to be double-barreled statement, repetitions were deleted after obtaining opinions from experts. After elimination, fifteen statements in each nutrition and health statements were retained for the study.

**Scoring of the statements**

The statements were scored in accordance with the general practice by assigning numerical weights to the statements. Agree (3), uncertain (2), Disagree (1). The score of each respondent was computed by summing the weights of the responses made to each individual item. The range of the total score on the scale under the present study is 30 - 90.
3.8.2.4. Development of Checklist to measure Nutrition and Health Practices

The items of the test were developed based on the content of NHEd. All the items were placed with two alternative responses- yes/no. In scoring the statements, correct responses were given one mark and the wrong responses were given zero mark.

3.8.2.5. Opinionnaire

The final part of the Interview Schedule is Opinionnaire.

After reviewing the literature and discussions with ICDS personnel regarding the adolescent girls scheme, the investigator prepared a list of statements expressing the attitude of beneficiaries towards the delivery system of the ICDS scheme. The tool prepared had five-point scale to measure their attitude towards the topics covered in group meetings. The five-point scale consisted of five degrees namely strongly agree, agree, undecided, disagree and strongly disagree. Each point on the scale carries a score. The score value given to strongly agree- five, agree- four, undecided- three, disagree- two and strongly disagree-one.

3.9 Conduct of the Study

3.9.1 Pre-test

It is very essential to pre-test the tool. The optimum time needed for collecting information had to be determined. Vagueness and ambiguity have to be removed. The time that interviewee could spare has also to be determined. Hence pre testing was carried out with fifty Anganwadi workers as well as the fifty adolescent beneficiaries, who were not part of the final sample. On the basis of experience gained in pre-testing, the final schedule was redrafted.
3.9.2 Administration of the Tool

The investigator met the Anganwadi workers in their respective ICDS centers and explained to them about the purpose of the study. Through informal conversation, good rapport was established with them and collected the required information using schedule - I. The beneficiaries of the adolescent scheme were also identified from the Anganwadi workers. Using the interview schedule - II, the information were elicited from the adolescent beneficiaries.

Interview was the main method chosen for data collection because of its relative advantages for gathering data from the respondents. Further, this method could facilitate supplementary collection of data through observation during diet survey, nutritional assessment and also cross-checking of the responses for improving their reliability.

The investigator met the adolescent beneficiaries at their home, ICDS centres and some of the beneficiaries at their working area. Before interviewing, the need for the study was explained to them. Establishing rapport with the adolescent beneficiaries were found to be very easy since they mingled with people without any hesitation. It took a considerable amount of time to collect data from them.

The highlights of the base-line findings from the interview schedule-1 and II revealed the need for strengthening the delivery system of nutrition and health education package.

3.9.3 Nutrition Education Programme for Anganwadi Workers

The findings of baseline survey indicated that all the Anganwadi workers had less than optimal knowledge required for conducting NHEd sessions. The mode of delivery such as duration, frequency, method
and teaching aids were also found to be inadequate and inappropriate in most of the cases. This seems to be the weak spot of the service delivery. The data related to adolescent beneficiaries shows that their nutrient intake was less than the RDA, many were graded under CED III, and they fell under mild and moderate forms of anemia.

As a part of the study, nutrition education package was designed and it was planned in such a manner to develop awareness and improve their attitude towards a better nutrition management for themselves and it can be imparted to the beneficiaries in the following NHEd sessions:

The components for the nutrition and health education were picked up based on the topics handled by them during nutrition and health education sessions. The topics included for nutrition education are given below:

1. Adolescence - Growth and Development.
2. Nutritional Care during Pregnancy and Lactation.
   • Vitamin A Deficiency
   • Iron
   • Iodine
6. Personal hygiene and environmental sanitation.
7. Growth monitoring.
8. Diarrhoea
9. Immunization
3.9.4 Designing Curriculum for Education Intervention to the Anganwadi Workers

Considering the above observations, efforts have taken to strengthen the NHEd delivery. Hence forth, education intervention was provided to the Anganwadi workers and the messages were reinforced to them through a structured module prepared by the investigator.

The curriculum planned and prepared for NHEd sessions for intervention purpose is given below:
<table>
<thead>
<tr>
<th>S.No</th>
<th>Topics</th>
<th>Objectives</th>
<th>Content</th>
<th>Methodology</th>
<th>Training Material</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Physical Changes during adolescence</td>
<td>• Understand the physical changes that take place during adolescent period</td>
<td>• Physical changes</td>
<td>Body mapping, lecture, group participation</td>
<td>Flip charts</td>
<td>Learn about physical changes during adolescence.</td>
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<tr>
<td></td>
<td></td>
<td>• Explain the sequence of changes in the body.</td>
<td>• sequence of change</td>
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<tr>
<td>2</td>
<td>Basics about food and nutrients</td>
<td>• Understand the functions of food</td>
<td>• Introduction about food and nutrients.</td>
<td>Lecture, Participatory Learning Method.</td>
<td>Posters, Charts</td>
<td>Learn about food, nutrients, sources and functions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enumerate the functions and sources of nutrients</td>
<td>• Nutrients their functions and sources.</td>
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<tr>
<td></td>
<td></td>
<td>• Explain the importance of various nutrients in the body.</td>
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<td></td>
<td></td>
<td>• Relate the need for variety of foods in the diet.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Nutritional care during pregnancy lactation, breast Feeding and weaning foods.</td>
<td>• Know about the importance of nutrients during pregnancy and lactation.</td>
<td>• Nutritional requirements during pregnancy and lactation.</td>
<td>Lecture group discussion followed by presentation</td>
<td>Posters, Flipcharts, Charts.</td>
<td>Learn about nutrients requirements during pregnancy and lactation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Understand the importance of breast feeding.</td>
<td>• Factors influencing lactation.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Care during breast feeding.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.No</td>
<td>Topics</td>
<td>Objectives</td>
<td>Content</td>
<td>Methodology</td>
<td>Training Material</td>
<td>Process</td>
</tr>
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</tr>
</tbody>
</table>
Explain the need for including micronutrients in the diet.  
Understand the deficiency symptoms due to insufficient micronutrients. | Micro nutrient deficiencies – Vitamin A, Iron and Iodine sources and doses of each micronutrient. | Lecture, group discussion demonstration, Participatory method.  
Folder vitamin A deficiency charts, Folder - Iron deficiency anemia. Iodine testing kit – Iodine deficiency disorder, Booklet | Learn about micronutrient deficiencies symptoms, doses and food sources. |                                                                                                                                 |
| 5    | Growth monitoring                           | Understand the needs and benefits of growth monitoring.  
Steps for growth monitoring and counselling | Growth monitoring need, benefits, steps in growth monitoring. | Demonstration Lecture  
Salter Scale Booklet. | Understand the essentials of growth monitoring. |                                                                                                                                 |
| 6    | Environmental Sanitation                    | Explain the need for controlling environmental factors in prevention of diseases.  
Understand the various communicable and non-communicable diseases due to environmental factors. | Environmental sanitation – communicable and non-communicable diseases. | Group discussion and Lecture  
Charts, Handouts Posters. | Learn about environmental sanitation, communicable and non-communicable diseases. |                                                                                                                                 |
<table>
<thead>
<tr>
<th>S.No</th>
<th>Topics</th>
<th>Objectives</th>
<th>Content</th>
<th>Methodology</th>
<th>Training Material</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Personal hygiene</td>
<td>- Understand the importance of personal hygiene in day to day activities.</td>
<td>- Need importance</td>
<td>Group discussion</td>
<td>Charts booklets</td>
<td>Learn about the importance of personal hygiene</td>
</tr>
<tr>
<td>7</td>
<td>Immunization</td>
<td>- Understand the importance of immunization.</td>
<td>- Immunization schedule.</td>
<td>Group activity, lecture</td>
<td>Charts, booklets</td>
<td>Learn about the importance of immunization during childhood and pregnancy.</td>
</tr>
<tr>
<td>8</td>
<td>Diarrhoea</td>
<td>- Explain the ill effects of diarrhoea in children under five years.</td>
<td>- Diarrhoea - causes, symptoms, and foods should be taken, oral rehydration therapy.</td>
<td>Participatory method, lecture.</td>
<td>Flash cards, charts</td>
<td>Understand the importance of breast milk during diarrhoea and oral rehydration therapy.</td>
</tr>
</tbody>
</table>
3.9.5 Impact of the Nutrition Education Programme

After the intervention programme, the Anganwadi workers were given sufficient time to improve the quality of service delivery provided to the beneficiaries. NHEd post-evaluation was carried out using the same nutrition knowledge assessment tool. After eight months, interval, post-evaluation was carried out for the Anganwadi workers and after ten months for the adolescent beneficiaries.

3.10. Statistical analysis of the data

The analysis was carried out using Statistical Package for Social Sciences (SPSS) 10.0 version for analyzing the frequency distribution, percentage and simple average. The data have been presented in the form of tables, figures and charts for analysis and discussion. The analysis was mainly qualitative and descriptive in nature. Inferences were made on the basis of problems identified from the data obtained through the interview schedule.

3.11. Limitations of the study

1) The study focused only on the delivery system of empowering nutrition and health aspects to the target group. Other benefits accrued by the adolescent beneficiaries could not be quantified and analysed in depth.
2) Due to time constraints, the study was restricted to only one block.
3) No comparisons between adolescent beneficiaries and non-beneficiaries were made.
4) The study focused only on the NHEd component delivered to the adolescent beneficiaries to have a deep insight.
5) Due to practical difficulties in the field situation haemoglobin analysis were carried out only to one hundred samples only.