METHODOLOGY
3. METHODOLOGY

The methodology adopted for the investigation has been presented in this chapter. This section comprises particulars about selection procedures, development of instruments, measurement of variables, experimental design, data collection and processing procedures and operational definitions.

3.1. Selection

3.1.1. Area and Sample

In order to evaluate the efficacy of four functional strategies of nutrition education, a cluster of five villages viz., Mallavaram, Peruru, Perumallapalle, Ramanujulapalle and Tummalagunta was selected. These villages are drawn from Chandragiri block of Chittoor district, Andhra Pradesh. They are located at short distance (less than one kilometer) to one another. The purposive selection was followed to avoid significant variations in physical, social and cultural conditions, since they would strongly influence the individual's food behaviour (Hochbaum, 1981; Glanz, 1981 and Lennon and Fieldhouse, 1982) and in turn affect the setting created for testing the strategies. Since one of the strategies viz., Motivational requires the existence of an income generation programme in a village, purposive
selection was adopted. The strategies and the control were distributed at random among the five villages with the exception of one strategy i.e., motivational as indicated.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Strategy</th>
<th>Village</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Behavioural</td>
<td>Perumallapalle</td>
</tr>
<tr>
<td>2.</td>
<td>Educational</td>
<td>Mallavaram</td>
</tr>
<tr>
<td>3.</td>
<td>Instructional</td>
<td>Peruru</td>
</tr>
<tr>
<td>4.</td>
<td>Motivational</td>
<td>Ramanujulapalle</td>
</tr>
<tr>
<td>5.</td>
<td>Control</td>
<td>Thummalagunta</td>
</tr>
</tbody>
</table>

The physiographical location of the four villages is depicted in Figure 7.

The requirements for the strategies selected were individual attention, dialogue, face-to-face interaction and discussion. McCrosky et al. (1971) and Burgoon et al. (1974) found that small group (2 or more persons upto 25) is ideal to facilitate the above mentioned requirements. Therefore, small group was thought to be appropriate for the present investigation. Fifteen mothers who would fulfil the criteria mentioned below were purposively selected from each village.

Mother should

1. have a pre-schooler;
SAMPLE VILLAGES
1. PERUMALLAPALLE
2. MALLAVARAM
3. PERURU
4. RAMANUJULAPALLE
5. TUMMALAGUNTA

Figure 7.
2. belong to a middle income (Rs. 10,000 per annum as stated by Tyagi (1984) group (but the group of mothers selected for motivational strategy previously belonged to a low income group. Now their income level was raised to the level of middle income due to the introduction of an income generation programme);

3. belong to age group ranging from 15 to 35 years;

4. not have been exposed previously to any rigorous training in nutrition and health education.

These criteria were adopted for the sample selection due to the following reasons respectively.

Criteria 1. The presence of the child would motivate the mother to practice what was learnt.

2. Middle income group family has the means to provide balanced diet to the pre-schooler and others in the family. Conspicuous variations in economic status of the mother would affect the practice of what was learnt.

3. Mothers of the age below 15 and above 45 may not have a pre-schooler to practice what was learnt.

4. The rigorous training will vitiate the results of the investigation.

Thus there were 74 rural mothers in all, selected for the investigation. They were either illiterates or low-liberates (primary education). They belonged to the
families having the size ranging from 3 to 10 members.

3.1.2. Variables

Several researchers and educationists in nutrition education (Hochbaum, 1981; Glanz, 1981; Sims, 1981; Pelto, 1981; Lennon and Fieldhouse, 1982 and Brun, 1985) suggested that product evaluation must be focused in evaluating any nutrition strategy. Product evaluation includes knowledge, attitude, belief and behaviour related to foods and nutrition. These factors operate at the individual level and have scope for modification through nutrition education (Sims, 1981 and Lennon and Fieldhouse, 1982). Hence the change is possible in knowledge, attitude, belief and behaviour which are internal to the individual, provided the educational strategy is effective (Hochbaum, 1981 and Lennon and Fieldhouse, 1982). Further, the factors like physical, socio-cultural, economic and situational which are external to the individual concerned are more stable than the internal factors. They are beyond the scope of nutrition education intervention alone. Therefore, the factors which are at the individual level, were chosen to determine the efficacy of the selected strategies.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Nature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behaviour</td>
<td>Dependent</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>Intervening</td>
</tr>
<tr>
<td>Belief</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Independent</td>
</tr>
<tr>
<td>Family</td>
<td></td>
</tr>
</tbody>
</table>

3.1.3. Strategies

Selection of strategies was mainly based upon empirical evidence obtained through earlier research (Glanz, 1971; McClintock, 1972; Gillespie, 1981 and Paulsen et al., 1981). Several researchers and educators in the field felt that the ultimate goal of nutrition education is change in food behaviour. Further, it was agreed upon that this food behaviour is immediately backed by individual's and/or family's attitude and beliefs, for which knowledge is imperative but need not be emphasized unless the need for it is felt by the concerned (Sims, 1981; Hochbaum, 1981 and Birch, 1981). Several approaches which emphasise the change in behaviour and attitudes were theoretically proposed and only few of them were tried out in specific situations. Comparative studies are limited, therefore, Brun (1985) commented by saying "It is impossible to arrive at, which strategy is effective to change the behaviour at this juncture. Hence, change in
food attitude and behaviour was kept as prime concern to select the strategies. Such strategies can only be designed as 'functional' which focus upon the sustained food behaviour (McClintock, 1972 and Olson and Sims, 1981). Further, each selected strategy contains more than one approach. The approaches included have empirical evidences (Lewin, 1944; Larson et al., 1974 and Bright Well and Sloan, 1977). Thus the strategies were modified to suit the conditions prevailing in rural areas, without altering the basic principles to specific approaches. Four such strategies viz., Behavioural, Educational, Instructional and Motivational were chosen for comparative evaluation in the rural context.

### Salient Features of the Strategies

#### 3.1.3.1. Behavioural: The basic assumption behind this strategy is that the behavioural change is followed by change in attitude and supplementation of relevant information on demand. Selection of a rural Social Model who has desirable food behaviour is a precondition to the strategy which is being tested. This selection was done using participant-observation and socio-metric techniques. Later the selected Social Model was provided with relevant skills, attitudes and knowledge related to pre-school child nutrition using dialogue approach. Need was not felt by the investigator to train the 'Model' in communication
skills because she was found to be talented in her communication with her neighbours and others in the community.

Learning activities -

1. Social modelling (Social Model person in the village) - Exposure to five dimensions* of food behaviour in five sittings with a minimum interval of five days. Only positive behaviour was emphasized. Model person was stimulated and supported by the investigators as and when necessary.

2. Role-playing - Practice of the model behaviour (only positive behaviour) - Guided practice from the model to others in the community.

3. Reinforcement - Encouragement of progressive behaviour - during individual contacts.

4. Transfer of learning - Encouragement of the model behaviour in the natural setting - Involving family members' support at critical stages through participant-observation.

Sample situations of different learning activities of behavioural strategy are presented in Figure 8.

3.1.3.2. Educational: The basic presumption is that the change in attitude is aimed by way of engaging the people in desirable behaviour and the relevant information

*1. Food choice
2. Food preparation
3. Feeding
4. Dietary care during diseases
5. Hygienic practices
EXPOSURE TO SOCIAL MODEL

GUIDED PRACTICE

Figure 8. Situations of Behavioural strategy
was provided as and when necessary.

Learning activities-

1. Diagnose the undesirable practices along the lines of five dimensions of food behaviour Inquiry method

2. Diagnose the reasons (self/family/traditional/cost/availability) Persuasive approach

3. Feeling the need to change (Involve the members of the family as per the need) Reinforcement

4. Practice of the desirable food behaviour

Sample situations of educational strategy are presented in Figure 9.

3.1.3.3. Instructional: The basic assumption here is that the behaviour will result provided the relevant information is supplied.

Learning activities -

1. Information giving along the line of five dimensions of food behaviour Giving instructions

2. Emphasis - Positive effects of desirable practices - negative effects of undesirable practices Dialogue approach

3. Advocating the practice of desirable food behaviour Reinforcement
Figure 9. Situations of Educational strategy
Sample situations of instructional strategy are
given in Figure 10.

3.1.3.4. Motivational: The basic presumption is
that the change in attitude is aimed by way of engaging
the people in desirable behaviour and the relevant infor-
mation was provided as and when necessary. The investi-
gator associated herself with the organizers of Society
for Development of Rural Sericulture Industry (SDRSI).
A few preliminary visits along with the organizers were
paid to the families which are getting additional income
from the sericulture project, to establish rapport.
This created a favourable attitude towards the investiga-
tor herself and in turn increased the credibility of the
investigator.

Learning activities -

1. Analysis of the food behaviour of the group along the lines of five dimensions - Identification of undesirable practices
   \Discussion - Decision

2. Perception of the need for change - Emphasis on the dangers
   \Fear appeal

3. Intention to change
   \Reinforcement

4. Practice of desirable food behaviour

Sample situations of motivational strategy are
presented in Figure 11.
Figure 10. Situations of Instructional strategy
IDENTIFICATION OF PROBLEMS

GROUP PARTICIPATION

Figure 11. Situations of Motivational strategy
Based on the process and kind of interactions underlying each of the approaches different kinds of interrelations were viewed among the expected effects product outcomes viz., knowledge attitude and behaviour. The models of interrelations viewed in the four strategies are presented in Table 8.

**TABLE 8: Interrelations of Variables in Different Strategies**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Strategies</th>
<th>Interrelations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Behavioural</td>
<td>$\n$</td>
</tr>
<tr>
<td>2.</td>
<td>Educational</td>
<td>$\n$</td>
</tr>
<tr>
<td>3.</td>
<td>Instructional</td>
<td>$\n$</td>
</tr>
<tr>
<td>4.</td>
<td>Motivational</td>
<td>$\n$</td>
</tr>
</tbody>
</table>

$K$ = Knowledge; $A$ = Attitude; $B$ = Behaviour.

These interrelations do not mean that these are the only possible relations. There may be many possible relations with slight alterations in their order.

In all the strategies, messages related to the preschool child nutrition were processed in the milieu of the existing attitudes, beliefs, behaviour and knowledge of the target group (obtained through pre-testing). They were built into their system, but not presented in isolation.
3.1.4. Content

Content selection is one of the crucial elements in any nutrition education intervention (Greaves, 1974 and Devadas, 1977). As per the criteria suggested by Reddy et al. (1974), Jacoby et al. (1977), Gillespie (1981) and Brun (1985) and the above mentioned nutritionists for the preparation of the content, five dimensions of food behaviour expected were chosen. They were food choice, preparation, feeding, feeding during diseases and hygienic practices in the context of the nutritional health of the children and pre-school children in particular. Pre-school child nutrition was chosen because pre-schoolers would be in the formative stage and that planned behavioural change might pave the way to mould their food behaviour through the mother. The coverage of the content under each dimension can be seen clearly from the instruments (Tables 9 to 12) presented in Chapter 4 - Results and Discussion. Functional knowledge was given more importance. Small packages of relevant and usable information was derived.

3.2. Development of Instruments

Keeping in view the guidelines provided in section 3 under Review of Literature, four instruments were developed viz., knowledge, attitudes, beliefs and behaviour. The procedure followed for the development of each instrument is detailed below.
3.2.1. Knowledge and Behaviour Instruments

Based on the literature available, courtesy copies of the earlier instruments, the profile of the present target group and the selected content, an item pool of 115 items was identified. These items were sent to 60 experts in the field for content validation. The validity of the content was examined with reference to five aspects viz., accuracy, clarity, comprehensiveness, relevancy and importance. The expert opinion was called for to indicate how accurate, clear, and comprehensive the items of the contents. Relevance was determined in relation to two aspects viz., to the topic selected and to the target group. The items were refined based on the expert opinion. Irrelevant items were omitted using the criterion that 75 per cent or more of the experts agreed that an item was not relevant.

Further, the degree of importance of each item to maintain optimum level of nutritional health of pre-school children, was determined using the five point continuum viz., most important (5) to least important (1). These rankings were used to calculate scale values. Scale value for each item was obtained by taking the median of distribution of rankings given by the experts. Directions sent for the experts for evaluating the items are presented in Annexure I.
The items were pilot tested with a sample of 30 mothers. Validity and reliability were established using difficulty index and split-half reliability test respectively (Garrett and Woodworth, 1981). Thus 60 items with the scale values ranging from 2 to 5 were chosen for the final versions of knowledge and behaviour instruments. Sample of directions sent to the experts are given in Annexure I a and b.

In the knowledge instrument, format of the item was in question form. Question form was preferred to statement because it stimulates thinking in the mind of the respondent (Dugdale et al., 1979). Further, it is appropriate for the rural audience. Each item consisted of two aspects viz., (a) question presenting the fact and (b) question for reasoning. Each item consisted of three response categories viz., Yes/No/Don't know. Sample item of the knowledge instrument -

1. a. Is parboiled rice superior to raw rice? Yes/No/Don't know
   b. Why?

In the behaviour instrument, the item was presented in the form of a question representing the nutritional practice of an individual. Each item consisted of two response categories. Items included in the knowledge instrument have corresponding practice item in the behaviour instrument under each dimension of food behaviour. Sample item of the behaviour instrument -
1. Are you including parboiled rice items in the child's diet frequently? Yes/No

3.2.2. Attitude and Belief Instruments

Based on the literature available, courtesy copies of the earlier instruments, prevailing attitudes of the target group and the content selected, an item pool of 110 items were identified. Items were edited first using the criteria suggested by Edward (1957). Later, same procedure was adopted as mentioned in knowledge and behaviour instruments' section, for attitude and belief till the stage of refinement of items based on the criteria viz., accuracy, clarity, comprehensiveness and relevancy. The fifth criterion considered for attitude instrument was rigidity/flexibility. Items were selected using the criterion that 75 per cent or more of the experts agreed that an item reflected the attribute of rigidity or flexibility in regard to the practice of nutrition. Thus majority of the experts' opinions established the validity of the content as well as the orientation of the statement. Samples of instructions sent are given as Annexure I c and d.

Further, to determine the degree of flexibility, the items were placed on a 11-point Thurstone Scale Continuum viz., Most rigid - Most flexible. Similar procedure was adopted for food belief instrument, but the criterion was undesirability/desirability. Scale values were calculated
and pilot testing was done for these two instruments also as in the case of knowledge. Thus 50 items with the scale values ranging from 2 to 5 (rigid) and 6 to 9 (flexible) were chosen for the final version of the attitude instrument. Fifty items with the scale values ranging from 2 to 5 (undesirable) and 6 to 9 (desirable) were chosen for the final form of the belief instrument.

In both the instruments, items were presented in the form of statements. Each item was provided with two response categories viz., Agree/Disagree.
Sample items of attitude and belief instruments respectively -

1. Jaggery is preferred to sugar
2. Jaggery is heat producing

Instruments of knowledge, attitude, belief and behaviour (Tables 9 to 12) are presented in Chapter 4 - Results and Discussion. All the instruments were translated into the regional language (Telugu) and validated by experts. It was these translated instruments that were administered in the pilot, pre/and post tests.

3.3. Measurement of Variables

The knowledge score was awarded to the respondents as illustrated i.e., If the respondent gave the response 'Yes' to the positive question, the concerned scale value was awarded to the respondent. For the other two categories
viz., 'No' or 'Do not know', no score was given. Similarly, if the response is 'Yes' or 'Do not know' to a negative question, no score was given. If, on the other hand, the answer was 'No', the concerned scale value was given as a score.

Perceived knowledge and accuracy of knowledge were calculated using the following formulae:

Perceived knowledge = \[ \frac{\text{No. of questions marked 'Yes' or 'No'}}{\text{Total No. of questions}} \]

Accuracy of knowledge = \[ \frac{\text{No. of correct responses}}{\text{No. of responses marked 'Yes' or 'No'}} \]

For the behaviour items, if the mother was practising that particular item, she was given the concerned score value. Otherwise she was given zero.

In attitude and belief instruments, if the respondent agreed with the statement, the concerned scale value was given. Otherwise no score was given.

3.4. Experimental Design

The field experiments were conducted following the experimental design mentioned below. Total time taken for the execution of the experimental plan was seventy days. The investigator did have adequate experience and expertise both in nutrition education programme and nutrition education research to test the selected strategies.
EXPERIMENTAL DESIGN

ESTABLISHMENT OF RAPPORT → 5 DAYS IN TOTAL FOR FIVE VILLAGES

PRETESTING → \[ E_1 \quad E_2 \quad E_3 \quad E_4 \quad E_c \] → 3 DAYS FOR EACH GROUP \[ 3 \times 5 = 15 \text{ DAYS} \]

TRAINING THE SOCIAL MODEL → THIS WAS DONE SIMULTANEOUSLY SPARING PART OF THE DAY THROUGHOUT THE PERIOD DURING WHICH PRE-TESTING WAS DONE

TESTING OF STRATEGIES → \[ E_1 \quad E_2 \quad E_3 \quad E_4 \] → TWO SESSIONS FOR EACH DIMENSION OF THE FOOD BEHAVIOUR FOR EACH STRATEGY \[ 2 \times 5 = 10 \quad 10 \times 4 = 40 \]

POST-TESTING → \[ E_1 \quad E_2 \quad E_3 \quad E_4 \quad E_c \] → 3 DAYS FOR EACH GROUP \[ 3 \times 5 = 15 \text{ DAYS} \]
3.5. Data

3.5.1. Collection

Respondents were interviewed by the investigator to obtain their knowledge, attitudes and beliefs. The food behaviour was mostly obtained through participant-observation during the whole testing period. Participant observation method was followed to check the behaviour strategy along with the verbal behaviour of the respondents. For a few items, they were also interviewed by the investigator. Each instrument took less than an hour for collecting information from each respondent.

3.5.2. Processing

For testing the significance of increase in the scores after nutrition interventions (between the pre and post test scores), 't' test for significance of difference was used. Analysis of variance of one way classification was used to test the significance of the relative efficacy of different nutrition intervention strategies adopted.

Using computer analysis, step-wise multiple correlations (R) were calculated to determine significance of association between the variables viz., knowledge at recognition and reasoning, attitudes - rigidity and flexibility, beliefs - undesirable and desirable and food behaviour. Using the regression coefficients obtained
from this analysis, the Multiple regression equations expressing the relation between behaviour (dependent variable) and other intervening variables viz., knowledge, attitudes and beliefs are given under each of the four strategies. With the help of Multiple correlations the per cent variation in the dependent variable (food behaviour) explained by each of the intervening variables is given under each of the four strategies both in pre and post situations.

To observe the effect of the independent variables (age and family size) on the other variables viz., knowledge at two levels, attitudes, beliefs and food behaviour, 't' test was used. C.R of the two group means, into which the samples were divided on the basis of independent variables were used for this. Thus standard techniques were followed in the statistical analysis of the data (Garrett and Woodworth, 1981).

3.6. Operational Definitions

1. **Food/Nutritional behaviour** – Behavioural manifestation of the nutritional knowledge of an individual.

2. **Attitude** – Individual's predisposition towards the change in nutritional practices.
3. Belief - Socio-culturally derived faith with or without personal experience.

4. Knowledge - An individual's scientific factual information related to food, nutrition and its functionality.
   (a) K I - An individual's agreement to the correct, usable nutritional scientific fact presented.
   (b) K II - An individual's reasoning to one's agreement to the correct nutritional fact presented.

5. Functional strategy - It is a practical and promising methodology to influence either the individual's food behaviour or group's food behaviour in the desirable direction.

6. Social model - A person chosen from the community and who serves as a guide to other members of the community in the context of food behaviour.