RESEARCH METHODOLOGY

Chapter IV

RESEARCH METHODOLOGY

For conducting research in any field or area, it is necessary to develop a systematic procedure for working. So that required information can be collected and also to guide the investigator in systematic analysis of the information, so that proper inferences can be made.

Methodology includes techniques, devices and procedures applied for conducting the survey. Keeping this in mind, the following methodology has been developed prior to actually taking up the research work in the field. The investigator selected the survey topic, "Dietary profile of pre-school children of slum dwellers of Shillong city in Meghalaya state". For this purpose a questionnaire was designed in consultation with Dr. Neelma Kunwar, who was my guide. The research of any study may be generalizable when the methodology is to be designed in specified manner.

Selection of the area

The area selected for the present investigation was slums of Shillong city. It has 16 pockets of slums having 1,003.6 sq.km. area, in which 15,186 number of families are existing with 24,928 number of children. Out of 80,019 person (population). The study was confined to 200 preschool children situated in 5 different slums of Shillong.

Period of Investigation

The data collection was initiated during June, 2004 and it continued till March, 2005. Thus, the data collection took about 10 months time.

Selection of the sample

After selecting the slum pockets, the selection of number of sampling units was done. Sample of the study consists 200 preschool children of 0-6 years of age (40 children each from 5 slums). It was a purposive sampling. The samples were selected randomly.

Procedure of data collection

A pilot study was conducted on 5 families, from the selected slum area with the objective to know whether the schedule helps in collecting required information and is free of any ambiguity and complexity. Certain modifications were made and then the pre-tested schedule was developed to collect the information from the selected subjects.

Collection of data

The primary tools used in the study was a detailed proforma. Personal interview method was used to collect the data. For this purpose, a schedule was developed with the help of advisor.

"A schedule is usually applied to a set of questions which are asked and filled in by the interviewer in a face to face contact" (Elhance., 1995).

The schedule consisted of two parts :

1. General Information
2. Specific Information

General Information consisted of information regarding name, age, education, caste, religion, occupation, income, size of family, house number, no. of rooms, type of house, facilities at home, duration of residence and food habits.

The **specific information** consisted of four sections ie. A, B, C, and D.

Section: A related to know the hygienic conditions in the homes and the proper living in the slums.

Section: B related to food consumption habits, dietary intake and nutritional intake etc. This section had a chart for recording dietary intake of the pre-school children, in which the nature and quantity of each food consumed in past 24 hours was recorded in houschold measures. This section also had another table, which showed their daily nutrient intake in comparison with Recommended Dietary Allowances (RDA) given by ICMR.

Section: C related to anthropometric measurement and clinical survey. and

Section: D related to sources of nutrition education.

In the schedule, the question were structured with listing alternative answer. The respondent had to choose the appropriate one according to their choice. Prepared questionnaire is shown in appendix I.

The question regarding the general and specific information was asked from the respondent by the investigator herself. Firstly the data related to general characteristic were obtained. Then the detailed specific information related to food consumption habits, dietary intake, nutritional intake, clinical symptoms etc. were obtained.

The data related to the consumption of various food items were obtained. For this purpose 24 hours recall method was used in the sense that respondents were advised to provide information on the consumption of various food items of their pre-school child of the day prior to the day of the survey. Dietary recall data was not collected after the day of any occasion or fasting. Showing them standard cups made the standardization and bowls and then they were asked that how many cups of the food their child have consumed. In this context the data on the amount of various food items were obtained, which were later on converted into the form of raw material. It is to be mention here that it is quite

difficult to measure the consumption of various food items very accurately because the respondent themselves were not having any accurate records and the information provided by them may be considered only as approximate one.

To calculate the energy, protein and fat, we used Comprehensive Food Exchange List; the amount of food in household measures was converted into metric weight and the nutrient intake was calculated according to the RDA (ICMR, 1990).

Table 4.1 Weight and their equivalent measures

Food Stuff	Measure	Weight (g)
Milk	1 C	250 ml
Meat	1 egg	40
Pulse	3 T	30
Cereal	1 bread slice	20
Vegetable B	-	Variable
Fruit	1 portion	Variable
Fat	1 t	5
Sugar	1 t	5

Then the various anthropometric measurements were taken for the pre-school age children and they were examined clinically for the presence of any nutritional deficiency signs.

Anthropometric measurements

The pattern of growth and the physical study of the body though genetically determined are profoundly influenced by diet. Hence, anthropometric measurements are useful criteria for assessing nutritional study.

(a) Weight

Weight is the simplest measurement of growth and nutritional status. A weighing balance was used, which was adjusted to zero before measurement of each subject. Subject was made to stand straight ahead without touching anything. His height was recorded to the nearest 0.25 kg (Gopal Das, T. *et al.*, 1987).

(b) Height

For the height measurement measuring tape was used. Measuring tape was fixed on smooth wall. It was perpendicular to the ground, while floor was rough or smooth. The subject was ahead to remove his/her shoes, stand with the center his back touching the scale, with his/her feet parallel and heels, shoulders and back of the head touching the wall. The head was held comfortably erect. A smooth ruler was held on top of the head in the center, crushing the hair at right angle to the scale and the height read off from the lower edge of the ruler to the nearest 0.5 cm (Gopal Das, T. *et al.*, 1987).

(c) Mid upper arm circumference

The fiber glass tape was used for measurement of mid upper arm circumference with a minimum division of 0.1 cm. The subject was asked to flex his left arm at the elbow such that the lower arm at a right angle to the upper arm. The length between the acromian process of the scapula and oleranon process of the ulna was measured with a flexible fibre glass tape and the site of measurement exactly midway down the upper arm. The arm circumference was measured to the nearest 0.1 cm (Gopal Das, T. *et al.*, 1987).

(d) Head circumference

Head circumference is related to mainly brain size to small extend, to thickness of scalp tissues and the skull. The subject was asked to stand in a

steady position and circumference was measured by placing the flexible and non-stretchable measuring tape firmly sound the frontal bones just superior to supra orbital ridges; passing it round the head at same level on each side. Measurement was noted to the nearest 0.1 cms (Jellife, 1966).

(e) Chest circumference

It is also one of the indicator for measuring nutritional status of the child (Swaminathan, M. 1991). The subject was made in the standing position with their palms inverted in the axile. Measurement was taken with a flexible and non-stretchable measuring tape the nipple line, preferably in mid inspiration, measurement was taken to the nearest 0.1 cm (Jellife, 1966).

Clinical examination

Clinical examination is the most essential part of all nutritional surveys, since the ultimate objective is to assist levels of health of individuals and population groups as influenced by the diet they consume. All the symptoms were compiled and examined including hair, eyes, teeth, nails, gums, skeletal system, lower eyelid as well as general appearance (Swaminathan., 1991).

Nutrition education

The importance of nutrition education as a means for improving the nutrition of the community in developing countries has been increasingly realised during recent years. Lack of knowledge of dietary requirements and the nutritive value of different foods is the main contributory cause for the widespread occurrence of malnutrition among preschoolers. Nutrition education should be practical and adopted to suit the socio-economic conditions, food habits and local food resources. It should include effective demonstration feeding in which mothers take active part.

Tabulation and statistical analysis

"Statistical analysis are procedure used in finding out the numerical value of the whole study".

The data was put to further statistical analysis in order to draw meaningful conclusion. Percentage, mean, deficit percentage, standard deviation, correlation coefficient were used.

Percentage

Single comparisons were made on the basis of the percentages. For drawing percentages, the frequency of a particular cell was multiplied by 100 and divided by total number of respondents in that particular category to which they belonged.

Arithmetic mean

Arithmetic mean is the average used in the present study.

"Arithmetic mean of a series is the figure obtained by dividing the total values of various items of their number" (Elhance, 1995).

$$\bar{X} = A + \frac{\sum f_u}{\sum f_i} \times i$$

where,

$\bar{X}$ = Arithmetic mean

A = Assumed mean

$\sum f_u$ = Product of frequency and deviation taken from the assumed mean

i = Class interval

$\sum f$ = Total frequency

Deficit percentage

For drawing deficit percentage, nutrient intake was subtracted with RDA, multiplied by 100 and divided by RDA.

$$= \frac{\text{RDA} - \text{nutrient intake}}{\text{RDA}} \times 100$$

Standard Deviation

Concept of standard deviation was first used by Karl Pearson in 1893. It is defined as a positive square root of arithmetic mean of the square of deviation of the given observations from their arithmetic mean. It is denoted by the Greek letter (read as sigma) (Elhance, 1995).

$$\sigma x = \sqrt{\frac{\sum f - (x - \bar{x})^2}{(n-1)}} \quad \text{if } n < 30$$

$$\sigma = \sqrt{1/n \sum f (X_i - \bar{X})^2} \quad \text{if } n > 30$$

where, $\bar{X} = \frac{\sum fx}{n}$ is the arithmetic mean of the given value

Correlation coefficient (r)

Karl Pearson has given the formula for its calculation. The coefficient of correlation two variable is obtained by dividing the sum of the products of corresponding deviations of the various items of the two series from their respective means by the products of their standard deviations and the number of pairs of observation.

The coefficient of correlation or the product moment correlation is calculated by the following formula :

$$r = \frac{n\Sigma\Sigma fuv - \Sigma fu\,\Sigma fv}{\sqrt{[n\Sigma fu^2 - (\Sigma fu)^2]\,[n\Sigma fv^2 - (\Sigma fv^2]}}$$

where, r stands for correlation coefficient

n	=	number of observations
$\Sigma\Sigma fuv$	=	Sum of the product of deviation of x and y variables with their frequencies
Σfu	=	Sum of the product of deviation of x variable with the frequency
Σfv	=	Sum of the product of deviation of y variable with the frequency
Σfu^2	=	Sum of the product of squares of deviation of x variables with the frequency
Σfv^2	=	Sum of the product of squares of deviation of y variable with the frequency.