CHAPTER 3

MATERIAL AND METHODOLOGY
UNIVERSE OF THE STUDY

Present study has been conducted among college going girls of Jabalpur city Madhya Pradesh.

SAMPLING FRAME & SIZE

To collect relevant data from different colleges firstly all the colleges of Jabalpur city have been arranged in descending order on the basis of total number of students. Then after colleges having total number of girls students more than 50.0% were selected. Thus (15) colleges of Jabalpur city were selected as Sample College by stratified sampling method. Government Mohanlal Hargovind das College of Home Science, Government Man Kunwar Bai College, Chanchla Bai Patel Mahila Mahavidyalaya, Hawabag College, Mata Gujri College, Navyug Arts and Commerce College, St. Aloysius College, Government girls college Ranjhi,Hitkarini Mahila mahavidyalayam,Kesharwani College, Department of Government Engineering College, Department of Government Agriculture College and Govindram Sakseria College of Jabalpur city Madhya Pradesh were selected for study. The relevant data on 1000 Girls comprising 250 from each category i.e. general, other backward class (OBC), schedule tribe (ST) and schedule caste (SC) were selected by purposive sampling from selected colleges but the sample size of each college under study is different on the basis of their above said categories in order to make the sample a representative one.

TOOLS OF DATA COLLECTION:

NUTRITIONAL PROFILE

 Necessary Anthropometrics measurements for assessment of nutritional profile (i.e. height, weight, sitting height and chest girth) were taken on selected girls.
Measurements

Anthropometric measurements are important for the assessment of nutritional status of individuals. Various indices based on such measurements can give a view for the physical growth, body built and nutritional status of an individual as accurately as possible. Keeping the view of calculating the BMI indices, following measurements were taken on every girl student.

1. Body weight.
2. Height vertex.

The instruments used in the study are martin anthropometric rod, weighing machine and steel tape. During the time of measurements necessary directions were given to the girls and precautions were taken so as to minimize the errors and to get maximum accuracy in the measurements.

Following health indices are applied for the assessment of Nutritional profile among the college girls of Jabalpur city, Madhya Pradesh.

Body Mass Index

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

The obtained Index value of girls, in order to find out the percentage frequency of normal, under weight and over weight individuals is classified as per WHO specifications (WHO, 1995).

<table>
<thead>
<tr>
<th>BMI Range</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 16.0</td>
<td>Severe degree of malnutrition</td>
</tr>
<tr>
<td>16.0 - 16.99</td>
<td>Grade II Thinness</td>
</tr>
<tr>
<td>17.0 - 18.49</td>
<td>Grade I Thinness</td>
</tr>
<tr>
<td>18.5 - 24.99</td>
<td>Normal Range</td>
</tr>
<tr>
<td>25.0 - 29.99</td>
<td>Grade I Over weight</td>
</tr>
<tr>
<td>30.0 - 39.99</td>
<td>Grade II over weight</td>
</tr>
</tbody>
</table>
Data analysis

Data related to physical measurements were analysed by simple statistical techniques. The obtained Body Mass Index value of individual is classified as per WHO classification. Further analysis was done with the help of simple statistical techniques like correlation, and test of significance difference were applied to analyse the data.

AWARENESS TOWARDS FAMILY WELFARE PROGRAMME

To know the extent of awareness towards family welfare programme concerning information were collected through questionnaire consisting queries related to Health awareness, Reproductive Health, Antenatal and Postnatal Care, Family Planning methods, Immunization.

Data analysis

The data collected through questionnaire were analysed with the help of arithmetic mean.

Statistics used

1. **Arithmetic mean**: In order to condense the data into single value average is calculated which is representative of the distribution. Arithmetic mean is commonly used; it is a sum of all observations divided by number of observations.

   The mean of n observation \(X_1, X_2, X_3, \ldots, X_n\) given by
   \[
   \text{AM} = \frac{X_1 + X_2 + \ldots + X_n}{n}
   \]

   \[
   \text{AM} = \frac{\text{Sum of observations}}{\text{Number of observations}}
   \]

   \[
   \text{AM} = \frac{\Sigma x}{n} = \frac{\text{Sum } X}{n}
   \]

   Arithmetic mean is denoted by \(\bar{x}\) the notation \(\Sigma\) is read as Sigma and \(\bar{x}\) as X bar.
(ii) Standard Deviation: Average is a single value by which the whole data can be represented but it cannot describe the data completely. There may be two or more data sets with same mean but data sent play not be identical. Therefore study of variation is necessary. Variation is also known as dispersion. It gives the information, how individual observations are scattered or dispersed from the mean of a large series.

Deviation = Observation – mean

Standard Deviation is defined as the positive square root of the arithmetic mean of the squares of the deviations taken from the arithmetic mean. It is denoted by symbol σ, read as Sigma (Dixit, 2005).

Thus

\[ \text{SD}(\sigma) = \sqrt{\frac{\text{Sum}(x - x)^2}{n}} \]

\[ \sigma = \sqrt{\frac{\sum dx^2}{N} - \left( \frac{\sum dx}{N} \right)^2} \]

Where \( \sigma = \) Standard Deviation

\( dx = \) Deviation from assumed mean

\( dx^2 = \) Square of Deviation from assumed mean

\( N = \) Number of items

(iii) Coefficient of Correlation:

Two variables are said to be correlated when change in value of one variable causes corresponding change in the value of the other variable. The correlation may be positive or negative. In positive correlation increase in the value of one variable causes increase in value of the other variable or decrease in the value of the other variable. In negative correlation increase in the value of one variable causes decrease in value of the other variable and vice versa.

Prof. Karl Pearson has suggested a measure of degree of correlation called co-efficient of correlation it is calculated by the following formula and denoted by “r”. (Shukla & Sahai, 1988)

\[ r = \frac{\sum dx dy}{N \sigma_x \sigma_y} \]
Where \( r \) stands for Co-efficient of correlation.

\[ \Sigma \text{dx dy} \] : Stands for total of products of corresponding deviations of \( x \) and \( y \) series.

\( N \) : Stands for Number of pairs of items.

\( \sigma_x \) : Stands for Standard Deviation of \( x \) series.

\( \sigma_y \) : Stands for Standard Deviation of \( y \) series.

**Test of Significance : Z test**

Test for difference between two proportions:

It is used for judging the significance of difference between means of two independent samples.

This statistical theory is used to decide whether the observed difference between two sample mean can be attributed by chance *(Kothari, 1990)*.

\[ Z_{cal} = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}} \]

\[ T = 1.8856 \]

Test about Two population means

Where \( \bar{x}_1 \), mean of sample 1

Where \( \bar{x}_2 \), mean of sample 2

\( \sigma_1 \) SD of sample 1

\( \sigma_2 \) SD of sample 2

\( n_1 \) is number of item of sample 1

\( n_2 \) is number of item of sample 2

Z test is also used for comparing the sample proportion to a theoretical value of population proportion or for judging the difference in proportion of two independent samples.

\[ H_0 = \mu = \mu_0 \]

\[ Z_{cal} = \frac{\bar{x} - \mu_0}{\sigma / \sqrt{N}} \]
\[ \bar{x} \] Sample mean
\[ \mu \] - Population mean
\[ \sigma_p \] - SD of population
\[ N \] - is number of Itam.