CHAPTER - III

METHODOLOGY
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The previous two chapters were devoted to present the significance of the problem under investigation and for reviewing related literature. In this chapter, the procedure of the research study undertaken is described in detail. The major research question is related to the causes for low participation of students in Sports and Games.

Any research study involves the elements of observation, description or analysis of what happens under certain circumstance. Best and Kahn (1986) have evolved a simple three point analysis to classify educational research. It is as follows.

**Historical Research** describes *What was*. The process involves investigating, recording, analysing and interpreting the events of the past for the purpose of discovering generalizations that are helpful in understanding the past and the present, and, to a limited extent, in anticipating the future.

2. **Descriptive Research** describes *What is*, describing, recording, analysing, and interpreting conditions that exist. It involves some type of comparison or contrast and attempts to discover relationships between existing non-manipulated variables.

3. **Experimental Research** describes *What will be* when certain variables are carefully controlled or manipulated. The focus is on variable relationships. As defined here, deliberate manipulation is always a part of the experimental method.

Commenting on the scope and types of research in Physical Education Kamlesh\textsuperscript{73} says emergence of Physical Education and sport as a scientific discipline is comparatively a recent phenomenon. Therefore, the scope of research in this field knows no bounds. Most important areas are still unexplored. Even research designs in physical education and sports appear to be more complicated than in other fields. Philosophical method of research is used to determine and review "aims and objectives" of sports and physical education; laboratory method is applied to the study of numerous psychological, physiological variables; historical method is harnessed to study "what has been" in games and sports; surveys are conducted to evaluate present status/practices.

\textsuperscript{73} Kamlesh, M.L., "Methodology of research in Physical Education and Sport" (2\textsuperscript{nd} Ed. Metropolitan Book Co.Pvt.Ltd., New Delhi, 1994) p26
The present study is descriptive and it tries to discover relationship between causes for low participation. It tries to find out reasons for dismal state of affairs in sports and games participation in colleges of Sri Venkateswara University area.

The present chapter depicts the method of collection of data. It describes the statistical tools used for analysis.

The present study is confined to Sri Venkateswara University area, which encompasses the three districts namely: Chittoor District, Nellore District and Cuddapah District.

The study area is divided into three overlapping regions namely rural, semi-urban and urban areas. The distribution of student sample chosen district-wise, region-wise and sex-wise is shown in Table-2.
TABLE - 2
Distribution of Sample Students According to Sex, Region and District-wise

<table>
<thead>
<tr>
<th>District</th>
<th>Rural</th>
<th>Semi-Urban</th>
<th>Urban</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
<td>Male</td>
</tr>
<tr>
<td>Chittoor</td>
<td>12</td>
<td>11</td>
<td>23</td>
<td>25</td>
</tr>
<tr>
<td>Nellore</td>
<td>16</td>
<td>12</td>
<td>28</td>
<td>40</td>
</tr>
<tr>
<td>Cuddapah</td>
<td>26</td>
<td>17</td>
<td>43</td>
<td>42</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>40</td>
<td>94</td>
<td>107</td>
</tr>
</tbody>
</table>

Research Design

Sri Venkateswara University consists of 144 degree colleges which are affiliated to it. These colleges are situated in three districts namely, Chittoor, Nellore and Cuddapah, consists of 44, 41 and 59 colleges.
respectively. There are totally 56,092 students, among them 35,597 (63%) are male students and 20,495 (37%) are female students. Out of 144 degree colleges, 15 colleges have been selected by choosing 5 colleges from each of the three districts, using 'Simple Random Sampling without Replacement' technique.

The sampling design, which is adopted for the present research study, is the two stage Random Sampling technique with Simple Random sampling without Replacement at both the stages. The first stage sampling units are the colleges selected from three regions namely, rural, semi urban, and urban regions of each of the three districts. The second stage sampling units are the students from the selected colleges of the three regions. The sample consists of totally 600 students by choosing 200 students from each district. Among 600 students 378 (63%) were male students and 222 (37%) were female students. Table-2 gives the male and female students distribution according to three regions of three districts.

Collection of Data for the Present Study

In the present study, the statistical data is collected through questionnaires and schedules. The data collected is the primary data,
directly collected from the 600 students of 15 colleges of three regions of three districts. Before, the data collection, a pilot survey was conducted with the help of Physical Education teachers, who attended summer course in M.REd., at the S.V.University centre.

Two separate questionnaires were prepared one to collect the information from Physical Education teachers in the colleges and another to collect the information from the students of the selected colleges. The researcher visited all the selected colleges personally and distributed the corresponding questionnaires to the students after explaining in detail the contents of the questionnaire. The respondents filled in the questionnaires in the presence of the researcher. The questionnaire meant for the Physical Education teachers, were mailed to the concerned and got the filled in questionnaires by post.

The salient features of the questionnaires are:

A. Questionnaire given to the students

In the case of student questionnaire the following facts were asked for:

1. Details of the student
2. Details of participation in sports and games
3. Reasons for participation and also reasons for non-participation
4. Level of participation
5. Family & Friends encouragement
6. Institutional encouragement
7. (Copy of the questionnaire is presented in Appendix-I)

B. Questionnaire given to the Physical Education Teachers in Colleges:

In this case the following facts were asked for:

1. General information regarding the location of the Institution
2. Particulars of Physical Education teachers
3. Service conditions
4. Information regarding infrastructure facilities
5. Promotional aspects of Physical Education programme in the colleges
6. Financial position
7. Incentives & Awards

(The copy of the questionnaire is presented in Appendix - II)
STATISTICAL TOOLS FOR THE ANALYSIS

In the present research study, the various suitable statistical techniques namely Arithmetic mean, Standard Deviation, Percentages, Correlation Coefficient and its test of significance and Chi-square ($\chi^2$) test for the independence of two attributes have been applied to analyse the collected data. The formulae for the various statistical tools are given below:

(a) Arithmetic Mean ($\bar{X}$)

It is defined as the sum of the given observations divided by the number of observations. Symbolically, it is given by

$$X = \frac{\sum X}{n}$$

where $\sum X$ = sum of all observations

(b) Standard Deviation ($\sigma$):

It is defined as the positive square root of the arithmetic mean of the squares of the deviations of the given observations from their arithmetic mean. Symbolically, it is given by

$$\sigma = \sqrt{\frac{\sum X^2}{n} - (\bar{X})^2}$$

Where $\sum X^2$ = sum of squares of all observations
(c) **Correlation Coefficient (\( r_{xy} \)) :**

Karl Pearson's coefficient of correlation between two variables say \( X \) and \( Y \) is given by

\[
r_{xy} = \frac{\sum XY - \left( \frac{\sum X}{n} \right) \left( \frac{\sum Y}{n} \right)}{\sqrt{\left( \frac{\sum X^2}{n} - \left( \frac{\sum X}{n} \right)^2 \right) \left( \frac{\sum Y^2}{n} - \left( \frac{\sum Y}{n} \right)^2 \right)}}
\]

(d) **Test of Significance of Correlation Coefficient :**

To test for the significance of sample correlation coefficient \( r \) one may state the null hypothesis as \( H_0 : \) There is no significant correlation between the given two variables \( X \) and \( Y \).

To test for the null hypothesis, the student's t-test statistic is given by

\[
|t| = \frac{r \sqrt{n - 2}}{\sqrt{1 - r^2}}
\]

Where, \( r \) : Correlation coefficient

\( n \) : Number of pairs of observations.
By comparing the calculated value of $|t|$ with the critical value (or Table value) of t-statistic for (n-2) degrees of freedom at either 5% or 1% level of significance, one may draw the inference accordingly. If the calculated value of $|t|$ is greater than the critical value, then one can infer that there is significant correlation between the two variables X and Y. Otherwise, the correlation coefficient is said to be insignificant.

(e) $\chi^2$ - Test for Independence of two Attributes

Suppose A and B be any two attributes with r and s levels respectively. The qualitative data on these two attributes may give the following table known as (r x s) contingency table:

(r x s) contingency Table

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>..........</th>
<th>s</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>$O_{11}$</td>
<td>$O_{12}$</td>
<td>..........</td>
<td>$O_{1s}$</td>
<td>$(A_1)$</td>
</tr>
<tr>
<td>2</td>
<td>$O_{21}$</td>
<td>$O_{22}$</td>
<td>..........</td>
<td>$O_{2s}$</td>
<td>$(A_2)$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>$O_{r1}$</td>
<td>$O_{r2}$</td>
<td>..........</td>
<td>$O_{rs}$</td>
<td>$(A_r)$</td>
</tr>
<tr>
<td>Total</td>
<td>$(B_1)$</td>
<td>$(B_2)$</td>
<td>..........</td>
<td>$(B_s)$</td>
<td>N</td>
</tr>
</tbody>
</table>
Where, \( 0 \)'s are the observed cell frequencies \((A_1), (A_2), \ldots, (A_r)\) are the row totals \((B_1), (B_2), \ldots, (B_s)\) are the column totals \(N\) is the total frequency.

To test for the independence of attributes, one may state the null hypothesis as,

\[ H_0 : \text{There is no significant association between the two attributes} \]

\[ A \text{ and } B. \]

To test the null hypothesis, the \( \chi^2 \)-test statistic is given by

\[ \chi^2 = \sum \frac{(0 - E)^2}{E} \]

Where, \( 0 \)'s are the observed cell frequencies \(E\)'s are the corresponding expected cell frequencies, which can be computed by using following formulae:

\[ E_{ij} = \frac{(A_i)(B_j)}{N} \]
By comparing the calculated value of $\chi^2$ with the critical value (Table value) of $\chi^2$ statistic for $(r-1) (s-1)$ degrees of freedom at either 5% or 1% level of significance, one may draw the inference accordingly.

If the calculated value of $\chi^2$ is greater than the critical value, then one can infer that there is significant association between the two
attributes A and B, otherwise, one may infer that there is no significant association between the given two attributes.

In this chapter the research procedure adopted was described. The sampling techniques used and data gathering tools were described. The procedure adopted for collecting the data and statistical techniques used for analysing the data was explained. Chapter IV presents the details of the data analysis and interpretation of results obtained.