Chapter-III

METHODOLOGY

The methods and procedures applied for discovering answers to meaningful questions through the application of scientific method is known as methodology. Methodology is the core of any research which guides the Researcher to take the right path in completing the decided research endeavour. This chapter clearly defines the research method used to conduct the study. The researcher explains in this chapter, how the necessary data and information to address the research objectives and questions were collected, presented, analyzed and justification for the research design is given, research instruments, data sources, data collection techniques, data presentation techniques and analytical techniques used.

The purpose of the study was to find out the level of participation in physical exercises among female students and staff members of Karnataka State Women’s University. In this chapter, the selection of subjects, selection of variables, criterion measures, collection of data, description of research tools, statistical procedure followed for analysis of collected data were described.

3.1 RESEARCH DESIGN :

The present study was chosen as descriptive survey method. A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with in procedure. The purpose of the study was to study the level of participation in physical exercises among students and female staff members of Karnataka State Women University and also identify the factors that is internal and external barriers to physical exercises, knowledge of exercise benefits and exercise motivations on physical exercises among female students and staff members of Karnataka State Women’s University individually.
The research design is given below in Fig.3.1

3.2 SELECTION OF SUBJECTS

To achieve the purpose of the study, the researcher had extensive discussions and visited a number of degree colleges of Karnataka affiliated to Karnataka State Women’s University Karnataka State. The researcher used the stratified random sampling method for drawing the sample. This is a technique designed to ensure to representative sample and avoid bias by the use of random selection within each subgroups.

The population comprises of female students and female staff members of degree colleges. The stratification was made on the basis of courses at colleges affiliated to Karnataka State Women’s University (B.A., B.Sc. and B.Com.) and post graduate courses (M.A., M.Sc. and M.Com/M.C.A.).
For this purpose, 56 non-professional colleges of Karnataka affiliated to Karnataka State Women’s University were randomly selected for the investigation. Among them 15 aided institutions, 39 private unaided institutions and 2 government institutions were selected and also PG departments of Karnataka State Women’s University.

The subjects of female students studying in graduate and postgraduate courses from the affiliated colleges of Karnataka State Women’s University were selected. Totally 1800 college students were selected randomly, out of which 500 students from each stream of undergraduate courses (B.A., B.Sc and B.Com) and 75 students from post graduate courses (M.A., M.Sc., M.Com and M.C.A.) was taken as subjects of this study.

The subjects of female staff members working in degree colleges and post graduate departments of Karnataka State Women’s University were selected. Totally 300 staff members was selected randomly out of which Teaching Staff members are 158 and Non-Teaching staff members are 142 working in degree colleges and post graduate departments of Karnataka State Women’s University.

The data for the present study was obtained from 1800 female students from degree colleges affiliated to Karnataka State Women’s University is presented in Table-3.1 and Fig.3.2, Fig.3.3 and Fig.3.4.
Table-3.1

The table shows sample distribution

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Group</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Female Students</td>
<td>1800</td>
<td>86.36</td>
</tr>
<tr>
<td>2</td>
<td>Female Staff</td>
<td>300</td>
<td>13.64</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>2100</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Table-3.1 shows the number of secondary school students in the study. There are 1800 (86.36%) female degree college and university students and 300 (13.64%) female staffs working in degree colleges and various departments of Karnataka State Women’s University. The above frequencies are presented through a pie graph in Fig.3.1

Fig.3.1

Pie diagram shows the sample distribution over sex
Fig. 3.2

Sample: Female Students

Karnataka State Women’s University

Degree Colleges (56 Colleges)

Degree Students (1500)

Post Graduate Depts. (10 Departments)

Post Graduate Students (300)

B.A. (500)  B.Sc. (500)  B.Com (500)

Arts (75)  Science (75)  Commerce (150)

Fig. 3.3

Sample: Female Staff Members

Karnataka State Women’s University

Degree Colleges (56 Colleges)

Staff (225)

Post Graduate Depts. (10 Departments)

Staff (75)

Teaching (116)  Non-Teaching (109)

Teaching (42)  Non-Teaching (33)
3.3 SELECTION OF VARIABLES

The researcher reviewed various scientific literatures, based on the experience and knowledge gained by the following variables were selected for this study

The following variables were selected

A. Dependent Variables

Physical Exercises Practices

B. Independent Variable

1. Barriers to Physical Exercises.
2. Exercise Benefits
3. Exercise Motivations

C. Background Variables

For Female students
1. Type of Participation
2. Graduation Type

For Female Staff Members
1. Type of Participation
2. Marital Status
3. Type of Occupation
4. Type of Institution

3.4 PILOT STUDY

The researcher after the carefully preparing the questionnaire, administered the questionnaire to two selected schools and the physical education teachers and based on
the feedback received, updated a final questionnaire for the administration. Internal consistency correlation was used to establish reliability of the questionnaire.

3.5 COLLECTION OF DATA

The well prepared and standardized research tools were used to assess the inputs and sports participation of the students collected by visiting degree colleges affiliated to Karnataka State Women’s University. Of the receipt of the filled up questionnaire, the researcher personally visited the colleges and various departments at University and administered the research tools along with personal proforma. After the filling up the questionnaire by the students and staff members were tested and the data obtained only from female subjects. The collected data were properly scored according to the manual.

3.6 TOOLS OF RESEARCH

Tools of research employed in the study are presented in Table-3.2.

Table-3.2

Table showing the research tools used in the present Study.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Variable</th>
<th>Tools</th>
<th>Developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Physical Exercises Practices</td>
<td>Self Prepared</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Barriers to Physical Exercises</td>
<td>Perceived Barriers to Physical Activity Scale</td>
<td>Yoursself</td>
</tr>
<tr>
<td>3.</td>
<td>Exercise Benefits</td>
<td>Perceived Exercise Benefits Scale</td>
<td>Sechrist, Walker and Pender</td>
</tr>
<tr>
<td>4.</td>
<td>Exercise Motivations</td>
<td>The Exercise Motivations Inventory (EMI-2)</td>
<td>David Markland</td>
</tr>
</tbody>
</table>
3.7 DESCRIPTION OF THE TOOLS

3.7.1 Perceived Barriers to Physical Exercises/Activity.

Perceived Barriers to Physical Activity Scale developed by Youself (2012) was used to know the barriers to physical activity of degree college female students and women staff members. This questionnaire consists of 12 items to assess the internal barriers such as lack of energy, lack of motivation and lack of self efficacy (6 questions) and external barriers such as lack of resource, lack of social support and lack of time (6 questions) to exercising. All questions were negatively phrased with 5 responses ranging from strongly disagree (score 1) to strongly agree (score 5 responses). The sums of the categories scores were used to calculate total internal and external barriers. The test-retest reliability was found to be 0.88.

3.7.2 Perceived Exercise Benefits :

The Exercise Benefits Scale (Sechrist, Walker, & Pender) was selected as the measurement tool to assess the perception of female students and degree college women staffs about exercise benefits. The instrument has a four-response, forced-choice Likert-type format with responses ranging from 1 (strongly disagree) to 4 (strongly agree). Missing data was handled by calculating the mean number for the question unanswered. Scores on the total instrument can range from 29 to 116. The higher the score, the more positively the individual perceives exercise. The 29-item Benefits Scale has a standardized alpha of .954 Test-retest reliability was found to be 0.89 on the Benefits Scale.

3.7.3 The Exercise Motivations Inventory-2 (EMI-2)

The Exercise Motivations Inventory-2 (EMI-2) is a measure of participation motives or reasons for exercising. It was also developed to address problems identified with the original and to make it applicable to both exercisers and non-exercisers.
The *Exercise Motivations Inventory*-2 (EMI-2) developed by David Markland is a measure of participation motives or reasons for exercising. This inventory have 51 statements concerning the reasons people often give when asked why they exercise.

Each statement is very true for indeed, circle the ‘5’. If you think that a statement is partly true for you, then circle the ‘1’, ‘2’, ‘3’ or ‘4’, according to how strongly you feel that it reflects why you exercise or might exercise.

Sub scales and Scoring key for EMI-2

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Scale</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Stress Management</td>
<td>6, 20, 34, 46</td>
</tr>
<tr>
<td>2.</td>
<td>Revitalization</td>
<td>3, 17, 31</td>
</tr>
<tr>
<td>3.</td>
<td>Enjoyment</td>
<td>9, 23, 37, 48</td>
</tr>
<tr>
<td>4.</td>
<td>Challenge</td>
<td>14, 28, 42, 51</td>
</tr>
<tr>
<td>5.</td>
<td>Social Recognition</td>
<td>5, 19, 33, 45</td>
</tr>
<tr>
<td>6.</td>
<td>Affiliation</td>
<td>10, 24, 38, 49</td>
</tr>
<tr>
<td>7.</td>
<td>Competition</td>
<td>12, 26, 40, 50</td>
</tr>
<tr>
<td>8.</td>
<td>Health Pressures</td>
<td>11, 25, 39</td>
</tr>
<tr>
<td>9.</td>
<td>Ill-Health Avoidance</td>
<td>2, 16, 30</td>
</tr>
<tr>
<td>10.</td>
<td>Positive Health</td>
<td>7, 21, 35</td>
</tr>
<tr>
<td>11.</td>
<td>Weight Management</td>
<td>1, 15, 29, 43</td>
</tr>
<tr>
<td>12.</td>
<td>Appearance</td>
<td>4, 18, 32, 44</td>
</tr>
<tr>
<td>13.</td>
<td>Strong &amp; Endurance</td>
<td>8, 22, 36, 47</td>
</tr>
<tr>
<td>14.</td>
<td>Nimbleness</td>
<td>13, 27, 41</td>
</tr>
</tbody>
</table>

Scores on the total instrument can range from 51 to 255. The higher the scores had higher exercise motivation.
3.7.4 Data Collection:

After collecting the research data scales along with the scoring keys, the researcher contacted the college principals personally for the purpose of data collection. The test scale sheets were given to the subjects by personal interview. A brief description of test scales along with the objectives and importance of the study were explained to the subjects to ensure their honest, correct and sincere responses. The subjects were also ensured that their responses would be kept confidential and would be used only for research purpose.

3.8 STATISTICAL TECHNIQUES USED FOR DATA ANALYSIS

For determining the influence of perceived barriers to physical exercises, perceived exercise benefits, and exercise motivations variables on participation in physical exercises, descriptive statistics, and the outcomes of the statistical analyses that are: correlation, step-wise multiple and enter multiple linear regressions which are used to test the research hypothesis and independent sample t-test and one-way ANOVA is used to compare the differences among the two groups. The statistical techniques were employed for analyzing the data are shown in the following Table-3.3.

Table-3.3
Table showing statistical techniques and the purpose for which they were used.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Statistical technique(s) used</th>
<th>Purpose for which they were used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>t-test</td>
<td>To examine the significant differences between means pertaining to the criterion variables according to levels of variables (between two groups)</td>
</tr>
<tr>
<td>2</td>
<td>One-way ANOVA and Scheffe’s Post Hoc Test</td>
<td>To examine the significant differences of means pertaining to the Physical Exercises Practices according to levels of main independent variables and background variables. (between more than two groups)</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Statistical technique(s) used</td>
<td>Purpose for which they were used</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>Pearson’s Product Moment Coefficient of Correlation</td>
<td>To find out the significant relationship between the independent and dependent variable</td>
</tr>
<tr>
<td>4</td>
<td>Multiple Correlation and Regression</td>
<td>To identify the significant predictors of the Physical Exercises practices of female students and staff members to develop solutions for the regression equations.</td>
</tr>
</tbody>
</table>

### 3.8.1 t-test

This is used to find out the significant difference between mean scores pertaining to the participation in physical exercises, perceived barriers to physical exercises, perceived exercise benefits and exercise motivations of female degree college students and staff members according to their participation level and age.

The difference between means was tested using the formula.

\[
 t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}
\]

### 3.8.2 One-way ANOVA

A One-Way Analysis of Variance is a way to test the equality of three or more means at one time by using variances. Data were analyzed using One-way ANOVA test to determine whether significant differences occurred among estimates grouped by courses and type of institutions. To find out the One-way ANOVA value of Physical Exercises practices, barriers to physical exercises, exercise benefits and exercise motivations, a post hoc test (Scheffe) was used where significant difference occurred.
3.8.3 Pearson’s Product Moment Coefficient of Correlation

Correlation describes the degree or magnitude of the relationship between the two variables. The measure of this relationship between two variables is called co-efficient of correlation. Measures of correlation, by common convention are defined to take values ranging from $-1$ to $+1$. A value of $-1$ describes a perfect negative relation. All points lie on a straight line, and $x$ decreases as $Y$ increases. A value of Zero means that $X$ and $Y$ are independent of each other. A value of $+1$ describes a perfect positive relation between $X$ and $Y$. Pearson Product moment co-efficient of correlation was computed using the formula:

$$r = \frac{N\sum XY - (\sum X) \times (\sum Y)}{\sqrt{N\sum X^2 - (\sum X)^2} \times \sqrt{N\sum Y^2 - (\sum Y)^2}}$$

Where,

- $X$ = the sum of observations of variable $X$
- $Y$ = the sum of observations of variable $Y$
- $X$ = the sum of squares of observation on variable $X$
- $Y$ = the sum of squares of observation on variable $Y$
- $XY$ = the sum of the products of observations on $X$ and $Y$ variables
- $N$ = the number of Paired observations.

Pearson Product Moment Correlation was used to examine the relationship between the independent variables and dependent variable.

3.8.4 Multiple Correlation and Regression Analysis

The correlation between two variables is sometimes misleading and may be erroneous. If there is little or no correlation between the variables other than that brought about by their common dependence upon a third variable (or several variables) (Garret, 1973). As such, multiple correlation seems to be the most appropriate technique that can be used to analyze the relationship between dependent and
independent variables. For the purpose of the present investigation the Dolittle multiple correlation technique was chosen (Guilford, 1965). Because the “Wherry Dolittle method provides a method of solving certain types of multiple correlation problems with a minimum of statistical labour” (Garrett, 1966). Step wise solution for beta coefficients were worked out. Multiple regression equations were computed with the help of ‘β’ coefficients.

**Multiple Regression :**

The independent variables that were significantly correlated with Physical Exercises included in the multiple regression analysis.

The regression equation in score form, for n variables, can be written as:

\[ X_1 = a + b_1X_2 + b_2X_3 + \ldots + b_nX_n \]

In the above equation \(X_1\) is the criterion to be predicted. The regression coefficients \(b_1, b_2, \ldots, b_n\), etc., give the weights to be attached to the scores in each of the independent variable. Furthermore, these regression coefficients give the weights which each variable exerts in determining \(X_1\) when the influence of the other variable is excluded. From the regression equation of each of the several independent variables plays in determining the scores in \(X_1\) can be known. The criterion can be obtained developing and solving the normal equations. The Wherry Doolittle Method is used here to derive solutions.

All of the analyses have been done by statistical package for social sciences (SPSS).