Chapter - III

Methodology
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METHODOLOGY

The purpose of the study was to analyse the differences, if any, in the psychological and sociological factors among men and women players of the selected university teams in Andhra Pradesh. In this chapter, the method adopted for the selection of subjects, selection of variables, selection of tools (questionnaires), pilot study, test administered (survey by questionnaire), the experimental design and the method adopted for statistical treatment of data have been explained.

SELECTION OF SUBJECTS

For this study, men and women players who represented various universities from Andhra Pradesh in the south-west zone and All India Inter university tournaments were selected as subjects. The following table shows, the games and the number of players selected for the study.

Table - 1
SUBJECTS SELECTED FROM GAMES AND ATHLETIC TEAMS OF SELECTED UNIVERSITIES FROM ANDHRA PRADESH

<table>
<thead>
<tr>
<th>Game</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volleyball</td>
<td>48</td>
<td>36</td>
<td>84</td>
</tr>
<tr>
<td>Handball</td>
<td>48</td>
<td>36</td>
<td>84</td>
</tr>
<tr>
<td>Badminton</td>
<td>22</td>
<td>17</td>
<td>39</td>
</tr>
<tr>
<td>Ball Badminton</td>
<td>32</td>
<td>32</td>
<td>64</td>
</tr>
<tr>
<td>Basketball</td>
<td>48</td>
<td>48</td>
<td>96</td>
</tr>
<tr>
<td>Table Tennis</td>
<td>18</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>Athletics</td>
<td>39</td>
<td>17</td>
<td>56</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>255</strong></td>
<td><strong>204</strong></td>
<td><strong>459</strong></td>
</tr>
</tbody>
</table>
Out of the fourteen universities in Andhra Pradesh, based on the literature available, as the investigator felt that Andhra University, Osmania University, Sri Venkateswara University and Nagarjuna University were functioning for the past many years and have been participating in the inter-university tournaments more actively, the subjects were selected only from these universities.

Andhra University, Osmania University, Sri Venkateswara University and Nagarjuna University were selected as the sample units of the Andhra Pradesh Universities as they prove themselves to be worthy of being included as sample units on the basis of their credibility. They have participated in a number of sports events in the inter-university tournaments with contingents of strength and have created creditable records in many of these events.

For the selection of the subjects from these four university sites, the investigator first gained access to them in the following ways:

1. by seeking prior permission through a letter to the university authorities to include the university athletes as subjects;
2. by obtaining lists of university players who participated in various sports and games tournaments from the university authorities;
3. by requesting the university authorities to give direction to the directors of physical education of various universities to which the athletes belong regarding how to administer the test (designed in this study); and
4. by requesting the directors of physical education of various universities to administer the test to the university athletes.

Lists obtained from the four selected universities showed a total number of 459 athletes from the year 2002 - 2003 and they included male and female athletes.

**SELECTION OF VARIABLES**

The investigator reviewed the scientific literature pertaining to the study from books, journals, periodicals, and research papers and taking into consideration the need of the study and the feasibility criteria, the following independent and dependent variables were selected for the study.

*Dependent Variables*

The following psychological and sociological variables were selected as dependent variables for the study:

Psychological Variables
- Pre competition anxiety
- Trait anxiety and Aggression

Sociological Variables
- Courage
- Sportsmanship
- Leadership
- Cooperation and Sociability
Independent Variables

The data on the psychological variables and sociological variables were collected from men and women university players of various games and athletics. The following were the independent variables in the study:

I  Sex
   a. Male
   b. Female

II Game
   a. Volleyball
   b. Handball
   c. Badminton
   d. Ball Badminton
   e. Basketball
   f. Athletics
   g. Table Tennis

RATIONALE FOR THE SELECTION OF DEPENDENT VARIABLES

PSYCHOLOGICAL VARIABLES

Anxiety

Participation of sportsmen in competitive sports has intensified the psychic stress. Most of the researches pertaining to relationship between anxiety and sports are concerned with the questions as to how trait anxiety and state anxiety affect sports performance. In sport psychology research, competitive anxiety has been studied in relation to sex, age and sports
performance in various games. Studies indicate that anxiety is higher for women than for men. Anxiety shall be moderate among players for better performance in competitions. The investigator was interested in assessing the level of anxiety (state and trait) among men and women players of various teams to find out whether men or women possess greater, lesser or moderate level of anxiety and the differences between them.

Anxiety plays an important role in athletic performance. Anxiety can either enhance or inhibit performance. Whether its effect is positive or negative depends on how an individual perceives the situation.

Athletes with low anxiety level have been known to perform better in selected skills. A moderate level of anxiety is seen as less for the acquisition and performance of skills. The levels of anxiety either too high or too low tend to inhibit learning and performance.

Taking into consideration the above facts, anxiety was chosen, as a dependent variable.

**Aggression**

Aggression plays a vital role in the field of sports to achieve the desired goal. Aggression acts as intrinsic motivation during performance. It leads an athlete to execute the maximum level of performance.
Aggressive behaviour helps in the level of performance by disturbing the opponents. Though it influences the performance level of an individual, it charms the opponent.

In team games, aggressive behaviour collapses the combination set up of the opponent. It leads to the downfall of the level of performance. Due to the aggressive behaviour of an individual, the team-mates are also motivated to perform their level best.

The investigator chose aggression as a variable to see the difference in the status of the variable between men and women and players of different games as well.

**SOCIOLOGICAL VARIABLES**

Sports participation, like any other activity is stimulated by two kinds of factors, one operating within and the other outside the athlete that is, internal and external factors. Both these factors are regarded as socialization factors in sports participation. Sport, being a body-cum-mind building activity, depends primarily on the level of attitude of the participants towards it. Depending on the level of attitude, the extent of sports participation is formed. Considering this aspect, the level of attitude of the players has been taken as sociological factor in sports participation and sought to be measured. Attitude towards sports is determined by the kinds and quantum of benefits perceived from it.
Courage, sportsmanship, leadership, cooperation and sociability are the dimensions of attitude included as dependent variables in this study.

**SELECTION OF TOOLS (QUESTIONNAIRE)**

Questionnaire is a form distributed through mail and filled by the respondent under the supervision of the investigator or interviewer (Aggarval, 1975).

Questionnaire was used as a tool to collect data on psychological variables for this investigation. The following standard questionnaires were responded by university players:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Tool</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre competition anxiety</td>
<td>Sports Competition Anxiety Test Questionnaire (SCAT)</td>
<td>Rainer Martens</td>
</tr>
<tr>
<td>Trait Anxiety</td>
<td>Competition State Anxiety Test Inventory - 2 (CSAI - 2)</td>
<td>Rainer Martens</td>
</tr>
<tr>
<td>Aggression</td>
<td>Sports Aggression Questionnaire</td>
<td>Anand Kumar and PS. Shukla</td>
</tr>
</tbody>
</table>

The following questionnaire standardised and adopted by V. Perumal (2000) was responded by university players to collect data on sociological variables:

<table>
<thead>
<tr>
<th>Sociological Variables</th>
<th>Tool</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Courage</td>
<td>Social Attitude Scale</td>
<td>V. Perumal</td>
</tr>
<tr>
<td>2. Sportsmanship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Leadership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Cooperation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Sociability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PILOT STUDY

A pilot study was conducted on M. P. Ed. II year students of Alagappa University College of Physical Education as subjects. The following are the objectives of the pilot study:

1. To know the difficulty in administering the questionnaire.
2. To get a clear understanding about the duration of time which is required for answering the questionnaire.
3. To find out the reliability of tester.
4. To find out the reliability of the test.

VALIDITY AND RELIABILITY

The questionnaires administered to collect data on the psychological factors are the standard psychological tools. In order to collect data for sociological factors, the questionnaire constructed, standardised and adopted by Perumal (2000) was used.

Validity

In general, a test or technique is valid if it measures what it claims to measure. Validity is therefore concerned with the extent to which a technique is actually measured what it is intended to measure (Loveil and Lawson, 1970).

According to Rubin (1984), validity is the soundness of the interpretation of the test. It is closeness of the agreement between what the test measures and the behaviour it is intended to measure.
The most common type of validity are content validity, criterion related validity and construct validity.

**Content Validity**

It means that the test is the degree to which the sample of items, tasks or questionnaires on a test are representative of some defined universe or domain of contest (Clarke and Clarke, 1984).

The items of the questionnaire used as a tool in the study are so meaningful and aim at collecting the data valid for the study. As such content validity of the questionnaire used in this study was established.

**Reliability**

According to Safrit (1979), “the term reliability reflects the ability of the test to detect reliable difference between examiners”. Reliability may be measured by three techniques, such as

1. Single test administration
2. Test - retest and
3. Individual test score.

In order to find out the reliability of the test and tester, test - retest method was used in this study.

The investigator used only standardised questionnaire for assessing anxiety, aggression and social attitude. The purpose of this research study was to measure anxiety, aggression and social attitude levels among the inter university players of Andhra Pradesh.
**SCAT's Reliability**

SCAT's reliability was assessed by test-retest and analysis of variance (ANOVA) techniques. The test-retest reliability of SCAT - C was assessed for four samples of boys and girls, Grades 5 to 6 and 8 to 9, from the Champaign - Urbana, Illinois, public schools. Each sample completed SCAT - C and then was retested at one of four subsequent time intervals: 1 hour, 1 day, 1 week and 1 month. Test-retest reliability ranged from 0.57 to 0.93 with a mean of 0.77 for all samples combined. These are acceptable levels of test-retest reliability.

**Validity**

Although psychometricians have suggested that new psychological inventories must demonstrate a plethora of specific types of validity, consensus suggests that it is most important for new inventories to demonstrate content, concurrent, predictive, and construct validity. Although evidence reviewed in the previous section demonstrated that SCAT was reliable and that reliability is essential for an inventory to be valid, reliability does not ensure validity. The fundamental purpose of the following section is to demonstrate SCAT's content and concurrent validity.

**Reliability of CSAI - 2**

Test-retest reliability is inappropriate for state scales, so the only method of estimating reliability for the CSAI - 2 was by examining the internal consistency of the scale (Kerlinger, 1973). Internal consistency measures the
degree to which items in the same subscale are homogeneous. Cronbach's alpha coefficient was computed to assess the internal consistency of the CSAI - 2 on three samples using data collected in conjunction with concurrent validation. Separate alpha coefficients were computed for three CSAI - 2 subscales for each sample.

**Concurrent Validity**

The American Psychological Association's (1974) *Standards* for *Educational and Psychological Tests* recommends that self-report inventories be first validated by demonstrating concurrent validity with previously validated scales. Thus, concurrent validity is inferred when a new inventory is congruent with or divergent from theoretically predicted relationships using previously validated scales.

The concurrent validity of the CSAI - 2 was examined by investigating the relationships between each of the CSAI - 2 subscales and eight selected A - state and A - trait inventories. The same three samples of athletes that were used to evaluate the CSAI - 2's internal consistency also were tested for part of the new inventory's concurrent validation. Athletes in all samples completed SCAT and a second A - trait inventory and the CSAI - 2 and a second A - state inventory within 1 hour of when they actually competed.
SPORTS AGGRESSION INVENTORY

Reliability of the Test

Sport Aggression Inventory was administered on randomly selected sample of 500 subjects from different competitive sports (300 males and 200 females). The age range of the subjects was 17 to 25 years and they were involved in competitive sports at University level. In order to obtain test-retest reliability, it was administered to the same group after an interval of 6 weeks, however only 410 subjects (268 males and 142 female) were available.

Reliability of the sport aggression inventory was found to be quite high both by split-half and test-retest methods.

Validity of the Test

Content validity of the Inventory was established by (1) developing the construct definition of sport aggression and (2) by writing items intended to cover all areas of the construct. The 25 items of the Sport Aggression Inventory were found to be most discriminative ones from a pool of 46 items. Findings indicate that the items in the scale possess acceptable internal consistency. For calculating the concurrent validity, this inventory as well as Psychoticism scale of EPQ were administered to 200 subjects involved in college level competitive sports and the concurrent validity coefficient was 0.84 which was quite satisfactory. This inventory also correlated favourably (Co-efficient 0.078) with Bredemeier Athletic Aggression Inventory.
SOCIAL ATTITUDE SCALE

The development of Social Attitude Scale passed through the following phases.

1. Pre-pilot study phase,
2. Pilot study phase, and
3. Finalisation phase.

*Figure - B*

Flow chart showing the development of social attitude scale

**Pre-Pilot Study Phase**

The pre-pilot study comprised of two steps, namely, (i) pooling of statements, and (ii) selection of statements.
Pooling of Statements: The pre-pilot study phase was concerned with the preparation of statements intended to assess the attitudes of the athletes towards sports and to understand the dimensions thereof and to find out the extent of influence of the social factors on sports participation. The statements were pooled from the following sources:

2) an extensive review of literature which includes textbooks, journals and popular magazines related to sports and games,

3) formal and informal discussion with experts in the field of physical education, psychology, and sociology.

Based on the information collected from these sources, a large number of statements relating to the intended aspects of the study were compiled.

Selection of Statements: Statements compiled as per the methodology described above were then subjected to screening and editing. Ambiguous, confusing, redundant statements were eliminated and the simple, clear-cut, and crisp statements were retained and proceeded for inclusion in the study.

For the inclusion of the statements in the study, the following aspects were considered.

1) Whether the statements were relevant to the study;

2) Whether the language of the statements was simple, clear and direct;
3) Whether the statements would yield the entire range of data needed for the study; and

4) Whether the statements would give definite opinion of the agreement or disagreement.

**Pilot Study - Jury Opinion**

Though the statements were prepared with adequate care, the investigator wanted to have them verified by the experts. So he sent the statements to the supervisors, experts in physical education, education, and psychology for their comments and suggestions regarding the relevance and clarity of the statements. On the basis of their advice and suggestions, further editing of the statement was carried out. In this process, out of the thirty statements originally prepared, only twenty were earmarked as suitable and fit for measuring the attitude towards sports and the relative strength of the selected five social factors in influencing the athletes to participate in sports, which were the major objectives of this study.

**Finalisation Phase**

In the finalisation phase, the investigator designed the statements into five dimensions selected for the purpose, namely, courage, sportsmanship, leadership, cooperation, and sociability. Touching on these five dimensions, 20 statements were prepared, of which 10 had positive connotation and 10, negative connotation. The statements numbered 2, 4, 5, 7, 10, 12, 14, 16, 17
and 19 were positive and the statements numbered 1, 3, 6, 8, 9, 11, 13, 15, 18 and 20 were negative. These 20 statements were divided into five categories as follows:

1. **Courage** - Statements numbered 1 to 4
2. **Sportsmanship** - Statements numbered 5 to 8
3. **Leadership** - Statements numbered 9 to 12
4. **Cooperation** - Statements numbered 13 to 16
5. **Sociability** - Statements numbered 17 to 20

The questionnaire was titled as Social Attitude Scale and Likert-type scale was used for the purpose of measuring the attitude towards sports.

**RELIABILITY AND VALIDITY**

**Reliability**

Any instrument used in data collection must satisfy the criteria of reliability and validity. Hence for reliability, the questionnaire was subjected to test and re-test process. Test and re-test were conducted over the questionnaire at an interval of one month. Subjects for the test and re-test were selected from the Andhra University to which the investigator belonged. A sample of 25 university players - 18 males and 7 females were selected from the university teams that had participated in the inter-university sports tournaments during the year 2002 - 2003. The questionnaire forms were distributed to them in October 2002 and a week later they were collected from them. One month later, in November 2002, the same questionnaire was again
distributed to the same group of subjects. With the data obtained in the first test and in the second test, the intraclass (univariate correlation) reliability coefficient was computed. The following results were obtained in the computation.

**Reliability Co-efficient of Social Attitude Scale**

<table>
<thead>
<tr>
<th>Item</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Courage</td>
<td>0.93*</td>
</tr>
<tr>
<td>2. Sportmanship</td>
<td>0.98*</td>
</tr>
<tr>
<td>3. Leadership</td>
<td>0.94*</td>
</tr>
<tr>
<td>4. Cooperation</td>
<td>0.96*</td>
</tr>
<tr>
<td>5. Sociability</td>
<td>0.94*</td>
</tr>
</tbody>
</table>

* Significant at 0.01 level of confidence

The results proved the reliability of the instrument beyond doubt.

**Validity**

An instrument needs to be tested not only for its reliability but also for its content validity. Content validity of an instrument depends upon the fidelity with which it can measure whatever the investigator has in mind, namely, what he intends to measure. When a questionnaire is complex, that is, when it deals with various dimensions of the subject of the study, content validity test becomes essential.

The statements intended to measure the attitude of respondents towards sports and their evaluation of the relative strength of the factors
influencing the athletes to participate in sports had already been screened for their validity. They were referred to the jury for their comment before they were included in the questionnaire. Even though the questionnaire was prepared with the statements thus screened and confirmed to be valid, the instrument in its entirety was not subjected to content validity test. So, for the second time, the statements and other items in the questionnaire were subjected to screening and for this purpose, jury opinion from another set of experts was sought. Without any comment, the jury opinion came in favour of the questionnaire and content validity of the instrument.

**SCORING PROCEDURE**

**SCAT**

The procedure for scoring SCAT is identical for both forms. For each item one of three responses is possible: (a) Hardly ever, (b) Sometimes, and (c) Often. The 10 test items (2, 3, 5, 6, 8, 9, 11, 12, 14 and 15) are scored according to the following directions, whereas the spurious items (1, 4, 7, 10 and 13) are not scored:

1 - Hardly ever  
2 - Sometimes  
3 - Often  

Scoring for items 6 and 11 is reversed according to the following key:

1 - Often  
2 - Sometimes  
3 - Hardly ever
Thus, the range of possible SCAT scores extends from 10 to 30. SCAT questionnaires in which one test item is omitted can still be scored, but any inventory in which two or more test items are omitted should be invalidated. To obtain the SCAT score for a questionnaire in which a single test item has been omitted, compute the mean item score for the nine items answered, multiply this value by 10 and then round the product to the nearest whole number.

**Competition State Anxiety Inventory - 2 (CSAI - 2)**

The CSAI - 2 was given to all subjects. 27 items were adopted from CSAI - 2 questionnaire for the study. The completed questionnaire was scored as follows:

To score - Key for CSAI - 2

| Cognitive - A State | 1, 4, 7, 10, 13, 16, 19, 22 and 15 |
| Somatic - A State   | 2, 5, 8, 11, 17, 20, 23 and 26 |
| Self-confidence     | 3, 6, 9, 12, 15, 18, 21, 24 and 27 |
| Not at all          | 1 |
| Somewhat            | 2 |
| Moderately          | 3 |
| Very much           | 4 |

Only for item - 14 reverse scoring

| Very much          | 1 |
| Moderately         | 2 |
| Somewhat           | 3 |
| Not at all         | 1 |
Inventories that are missing no more than one response per subscale can still be scored, but any inventory in which two or more items from any one subscale are omitted should be invalidated. To obtain subscale scores when an item has been omitted, compute the mean item score for the eight answered items, multiply this value by 9, and then round the product to the nearest whole number.

**Aggression**

Aggression questionnaire containing 25 statements was administered, to find out the specific types of aggressive behaviour in competitive games and sports.

Measurement of aggression level of a player is not a priority with sports scientists. Keeping this in view, an inventory was constructed and standardised by the Anand Kumar & P. S. Shukla to measure aggression level of a player involved in competitive sports.

Forty six items were chosen to assess components of aggression in sports setting. The statements in English language were framed by the authors after expert opinion of sports scientists which respondents answer ‘Yes’ or ‘No’. The item analysis resulted in elimination of 21 items. The result was a final 25 items. In Sports Aggression Inventory (SAI), 13 items are keyed ‘Yes’ and 12 items as ‘No’. Higher score on the inventory indicates high sports aggression.
SOCIAL ATTITUDE SCALE - SCORING

After collecting the responses for the questionnaires from university teams, scoring was done through 20 statements of the questionnaire (on five dimensions covered in four questions each set in Likert-type scale).

For positive statements, points were given as follows:

- Strongly Agree: 5 Points
- Agree: 4 Points
- Undecided: 3 Points
- Disagree: 2 Points
- Strongly Disagree: 1 Point

For negative statements, points were given as follows:

- Strongly Disagree: 5 Points
- Disagree: 4 Points
- Undecided: 3 Points
- Agree: 2 Points
- Strongly Agree: 1 Point

ADMINISTRATION OF TESTS (QUESTIONNAIRE)

After the validity and reliability tests were over, the directors of physical education of the universities to which the selected 459 athletes belonged were contacted by mail and their consent was sought to participate in the study. All of them contacted by the investigator gave their consent. Multiple copies of questionnaire in the printed format were sent to them. With the questionnaire,
the following instructions were issued to the directors of physical education with regard to the administration of the tests to the university players/athletes.

1) The directors of physical education were requested to distribute the questionnaire forms to the university athletes and to collect back the filled-in forms after allowing sufficient time to the subjects.

2) The schedule for the distribution of questionnaire forms was left to the discretion of the directors of physical education which depended on their convenience.

3) The directors of physical education were instructed not to have verbal interaction with the students while distributing or collecting the filled-in forms.

4) They were further instructed not to reveal the nature of the study.

5) They were asked not to furnish any clarification to the students with respect to any question in the questionnaire.

6) They were instructed to check the filled-in forms that all questions were answered by the subjects while collecting the forms.

7) The respondents had been assured that their responses would be kept confidential and would in no way be disclosed to anybody under any circumstances. This assurance was given to ensure that they would give honest responses without any sense of apprehension or reservation. The directors of physical education also were advised to reinforce this assurance on their part.
The directors of physical education had been provided with a return addressed, stamped envelope in which to return the filled-in questionnaire forms. A reminder letter was sent to them after four weeks following the initial mailing. When the filled-in questionnaires were not received from the directors of physical education within the stipulated time, reminders were sent to them at two weeks intervals till the receipt of the completed forms. Thus within six weeks from the date of transmission of the questionnaire forms, the completed questionnaires were received from all directors of physical education.

**EXPERIMENTAL DESIGN AND STATISTICAL PROCEDURES**

The experimental design used in this study was 2 x 7 factorial design. The first factor was sex namely male and female. The second factor was games and athletics of selected universities of Andhra Pradesh. This design was used to find out the influence of each factor independently and also their combined influence on each of the selected variables.

Two - way analysis of variance was used to find out any significant difference on selected psychological and sociological variables between male and female players among different games of different universities of Andhra Pradesh. If the obtained 'F' ratio was significant for rows (sex) of only two means compared and columns (games and athletes), the Scheffe's test was used as a post hoc test of significance to find out any significant difference between any two paired means. If the interaction (sex and games) was significant, "simple effect test" was used as a post hoc test of significance.

The data were analysed using SPSS statistical package.