Chapter III
METHODOLOGY

The present study dealt with students’ and teachers’ attitudes toward physical activity and physical fitness and teaching physical activity and physical fitness respectively with the underpinnings of grade, gender, and sports participation and stage of service, and length of teaching experience. The researcher has tried to investigate the relationship between teachers’ and students’ attitudes toward physical activity and physical fitness. This chapter describes the procedure of scale development, outlines the procedures used for sample selection and data collection, and describes the statistical analysis that was employed on the collected data.

3.1 Method

The study followed systematic method of constructing tools for data collection and actual data collection. The present investigation consisted of three phases; scale development for assessing students’ attitudes toward physical activity and physical fitness, scale development for assessing the teachers’ attitude towards teaching physical activity and physical fitness and the last phase consisted of a descriptive survey of the school students and in-service teachers from selected schools and pre-service teachers.

**Phase one** comprised development of an instrument to assess students’ attitudes toward physical activity and physical fitness and to provide psychometric evidence of reliability and validity of the interpretation of scores from the attitudes instrument. In this phase standard procedures of scale development were followed which includes elicitation study, preliminary study, content validity study, and reliability study.

**Phase two** involved scale development for measurement of teachers’ attitude towards teaching physical activity and physical fitness. Standard procedures of scale development laid the foundation of this phase as well, this included defining the construct, developing item and establishing content validity.

**Phase three** was the descriptive survey, which was conducted to study the variations in attitudes toward physical activity and physical fitness based on groups of students. It also involved a survey to study teachers’ attitude towards teaching physical
activity and physical fitness and further finding out the association between teachers’ and students’ attitude.

3.2 Sampling

Population

Population of this study consisted of grade VI and IX students and Physical Education teachers from English medium secondary schools in Pune city affiliated to Maharashtra state secondary and higher secondary board of education and pre-service teachers from the Physical Education teacher training college from Pune city affiliated to Pune University.

Sample

To identify total population from the schools, the researcher accessed the latest updated (2005) list of schools published by the SSC board. After reviewing the list and physically verifying the appropriateness of the information, it was confirmed that the list was incomplete and inaccurate and hence did not suffice to the cause of this research. This list did not guarantee the totality of the population; hence random sampling was not feasible. The 102 schools that fit into the frame of the population for this research were finally identified by the researcher.

For the descriptive survey, a large sample was selected in multiple phases. Twenty eight schools (Appendix I) from the finalized list were selected using convenience sampling technique. From selected schools, one division each of Grade VI and Grade IX was selected using random sampling technique. All the students studying in the selected classes formed the sample of this work. (N= 2911)

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Students</th>
<th>Mean Age (in Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade VI boys sports participants</td>
<td>331</td>
<td>11.69</td>
</tr>
<tr>
<td>Grade VI boys non-participants</td>
<td>619</td>
<td>11.72</td>
</tr>
<tr>
<td>Grade VI girls sports participants</td>
<td>132</td>
<td>11.55</td>
</tr>
<tr>
<td>Grade VI girls non-participants</td>
<td>435</td>
<td>11.45</td>
</tr>
<tr>
<td>Grade IX boys sports participants</td>
<td>421</td>
<td>14.55</td>
</tr>
<tr>
<td>Grade IX boys non-participants</td>
<td>425</td>
<td>14.48</td>
</tr>
<tr>
<td>Grade IX girls sports participants</td>
<td>199</td>
<td>14.12</td>
</tr>
<tr>
<td>Grade IX girls non-participants</td>
<td>349</td>
<td>14.44</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2911</strong></td>
<td></td>
</tr>
</tbody>
</table>
Convenience sampling technique was used to select the Physical Education teachers in this study. Seventy in-service Physical Education teachers (46 male & 24 female) from the selected 28 schools who assented to participate in the study formed the in-service teachers sample, while the pre-service teachers sample of the study was all the 116 student-teachers (76 male & 40 female) pursuing B.Ed. (Phy. Edu.) from Chandrashekhar Agashe college of Physical Education in the academic year 2010-11.

3.3 Study Design

Descriptive survey design was employed. The independent variables investigated were: Groups of students, groups of Physical Education teachers and length of teaching experience. The dependent variables were dimensions of the Students’ Attitudes toward Physical Activity and Physical Fitness Scale and Teachers’ Attitude towards Teaching Physical Activity and Physical Fitness.

McMillan and Schumacher (1989) addressed 10 basic threats to internal validity. The following 10 threats were dealt with by the present researcher in the following ways.

- History – did not apply because the present study was descriptive survey.
- Selection – The study included all the students present on the day of data collection. The Physical Education teachers from the selected schools and all the pre-service teachers from a teacher training college took part in the survey.
- Regression – The chance factors were minimized by actually observing the student behaviour and assessing the attitudes in the validity establishment process.
- Testing – did not apply because the present study was descriptive survey.
- Instrumentation – did not apply because the present study was descriptive survey.
- Mortality – did not apply because the present study was descriptive survey.
- Maturation – did not apply because the present study was descriptive survey.
- Diffusion of Treatment – did not apply because the present study was descriptive survey.
- Experimenter Bias – data were collected by the researcher employing standard procedures and no treatment was administered.
• Statistical Conclusions – The threat of violating the basic assumptions of random sampling and equal groups could not be dealt with.

McMillan and Schumacher (1989) addressed two threats to external validity. The two threats were dealt with in the following ways.

• Population External Validity – random sampling was not feasible, therefore the results should be generalised only to children in similar schools.
• Ecological External Validity – no treatment was implemented and the instruments were administered by the researcher according to standard accepted procedures.

3.4 Procedure

The study was carried out in three distinct phases. Details of procedures in these phases are given below (Fig 3.1).
Phase One- Development of an instrument to assess students’ attitudes toward physical activity and physical fitness

To attain the objective of developing scale to assess students’ attitudes toward physical activity and physical fitness phase one was carried out. This phase comprised multiple phases namely elicitation study, preliminary study, content validity study, and reliability study.

Elicitation study-

- Elicitation involved defining construct of the scale. A thorough study of attitude theory, models and theories linking behaviour in physical activity provided for the definition of construct. This was also supported by the various attitude measurement methods and physical activity related attitude measuring scales. The in-depth theoretical background and deliberation with experts and physical educationists, the researcher decided to adopt the attitudes measurement model suggested by Kenyon (1968). This model with six dimensions of physical activity rendered foundation for the scale development.

- The program of physical education (objectives and content) was reviewed. The researcher examined curriculum for physical education at school level in the state of Maharashtra. The recently reframed curriculum at both primary and secondary level aimed at developing a physically educated individual who will adopt lifetime physical activity. The curriculum contained activities for motor development, body management skills, fitness development along with yoga and newly introduced theoretical concepts in physical education and sports. It provided for a variety of fun field activities, fitness and sports skill developmental activities and competitions (Maharashtra State Secondary and Higher Secondary Board of Education, 2006). The evaluation consisted of physical fitness assessment. The curriculum is based on diamond conceptual framework for physical education and is realistic, achievable and objectively measurable.

- Scale Design was finalized after studying the literature.

A) Scale content: The researcher intends to pinpoint the fact that the actual implementation of physical education program would be the key factor in the development of knowledge, belief, perception of physical activity, attitudes toward physical activity and skills. The experiences related to physical activity in
and out of the school determine students’ interest, preferences, motives and perceived barriers of physical activity. Hence the researcher conducted a preliminary survey using critical incident technique (Appendix II) to understand the motives and barriers to physical activity (Dawis, 1987).

In the preliminary phase of scale development, this survey elicited wide range of information to be included in the statement about the attitudes. The survey provided for respondents’ own words to be included in the scale items. This contributed a greater degree of authenticity and increased readability of the scale (Dawis, 1987).

B) **Scale format:** Attitudes are usually measured on scales that require an individual to indicate feelings toward a particular object by providing a response to a written statement, which is also called as subject centred or individual differences scale. This is most frequently done by using paper pencil instrument, which are organised into categories like Likert scale, two points scale or semantic differential scale (Hastad & Lacy, 1998).

In this research, items in the scale consisted of stimulus part (item stem) and a response part (the response choices). The item stem consisted of full sentences describing some attribute of an object or the state of the object, or some event involving the object to varying specificity or generality.

The response choices were in the form of phrases and the anchors were worded as strongly agree or strongly disagree.

1. **Format of statements:** in this research the scale comprised closed ended statements/questions asking participants to code their personal viewpoint directly into categories that were provided (Krosnick, Judd, & Wittenbrink, 2005, p.34).

2. **Number of points on rating scale:** the response choices format for the attitude measurement was rating scale. The classic Likert scaling using 5-point scale was adopted in this research.

3. **Translation ease:** the length of scale can influence the process by which participants map their attitudes onto the provided response choices. Dichotomous or trichotomous scale points permit reporting attitude easily. Trichotomous scale has advantage over dichotomous as it offers a midpoint for a participant with neutral attitude. Although it may be problematic to another person who has a moderately positive or
negative attitude, equally far from the scale midpoint and from the extreme end on the underlined continuum. Adding a moderate point on both sides of the scale is a good way to solve this problem. Thus, the individuals who want to report neutral, moderate, or extreme attitudes would all have opportunities for accurate mapping. The 5-point scale is adequate and suitable for fine grained distinctions (Krosnick, Judd, & Wittenbrink, 2005, p.36)

**Preliminary study**-

The scale was based on the Kenyon’s model of attitude measurement and contained several items relating to six dimensions of the attitude. For each of the six dimensions, universe of content was identified and 116 statements were drafted. The appropriateness of the statements relating in the six dimensions was ascertained by a 4 member panel of experts (Appendix III). This strengthened the content validity of the scale.

**Content-validity study**-

- **Demonstrating content validity after test development**- Although the content validity was demonstrated by performing a series of systematic steps during test development, the researcher assessed the content validity after the test was developed using content validation survey and the pilot study was conducted to check out how easily the scale instructions are followed, how well the scale format functions, how long the scale takes to complete and how appropriate the scale items are for the target respondent population.

- **Content validation survey**- The technique involved examining the extent to which experts agree on the content validity of the test items (Lawshe 1975). With this technique, the experts reviewed and rated how essential the test items were to the attributes the test measured. Then the content validity ratio was calculated providing a measure of agreement among the judges (Miller, 2006). The researcher had invited 4 experts (Appendix III) for the content validation survey and hence resorted to the minimum acceptable value of 0.99 as the content validity rating suggested by Lawshe (1975). To determine whether an item is essential, its content validity ratio is compared with minimum acceptable value. Sixty items did not meet the minimum values required for 4 raters. Hence these items were eliminated from the scale.
Reliability study-

- To estimate the internal consistency forty students of grade VI and IX from Bharatiya Vidya Bhavan School were randomly selected. A preliminary scale with 56 statements was administered, based on the responses, item to total correlation and Cronbach alpha was computed for each dimension separately.

- To improve the reliability and to maintain equality in number of statements in each dimension, a total of eight statements from different dimensions were eliminated after considering item to total correlation (Appendix IV) and difficulties reported by the students. This led to finalization of scale with a total of 48 statements distributed equally in the six dimensions.

- The item to total correlation in the six dimensions ranged from 0.27 to 0.80 (Appendix IV). The Cronbach alpha computed for each dimension of the final scale ranged from 0.78 to 0.88 (Appendix V). This showed high internal consistency and reliability for the statements in the scale that was thus finalized.

- Test-retest reliability- This was established by using test-retest method. Data on the 48 item final scale was collected from the 40 students of Bharatiya Vidya Bhavan School. Test was administered twice in an interval of a week’s time. The coefficient of correlation was calculated between the two scores of test administered. The coefficient of correlation ranged from 0.93 to 0.97 (Appendix VI), which meant that the test is highly reliable.

Phase Two- Development of an instrument to assess teachers’ attitude towards teaching physical activity and physical fitness

To achieve the purpose of developing a scale to assess teachers’ attitude towards teaching physical activity and physical fitness, phase two was carried out. This included defining the construct, developing items, establishing content validity, preparing vernacular version and reliability study of the scale to assess teachers’ attitude.

Defining construct

- Several research findings in other subjects have confirmed that teachers’ attitude toward the subject or teaching of that subject affect students’ achievement in and
attitude towards that subject. Teaching decisions are influenced by teachers’ attitudes towards several aspects like curriculums, goals, priorities and outcomes.

- The researcher zeroed in on the curricular outcomes of Physical Education as the domains of the scale, namely, motor skill development, social development, physical activity and physical fitness, and self-actualization for the measurement of teachers’ attitude toward teaching as suggested by Kulinna & Silverman (1999).

**Developing Items**

- The researcher prepared a basic draft of the scale after a deliberate review of literature. In the first draft 28 statements pertaining to different domains were written. After receiving feedback from colleagues who examined the scale, essential modifications were done in a language point of view.

**Establishing content validity**

- A panel of 3 experts was asked to ascertain the appropriateness of items in reflecting the measured construct and place them into their respective domains. The experts also judged whether the items in the instrument adequately sample the intended content of the construct. Based on the experts’ suggestions eight items were eliminated and the scale was readied.

**Vernacular version of the scale**

- To ascertain understanding of the scale thereby ensuring more authentic data, the scale was transformed into a vernacular language i.e. Marathi. The researcher with the help of language experts translated the scale from English into Marathi. The scale was reviewed again by the colleagues before finalizing the scale to assess teachers’ attitude towards teaching physical activity and physical fitness.

**Reliability study**

- To ensure consistency in the scale items, the scale was administered twice first in English then in Marathi, on 30 student teachers. The reliability coefficient calculated was 0.895 and was found to be significant at 0.01 level of significance.
Phase Three- Descriptive Survey

With the aim of examining students’ and teachers’ attitude this phase carried out standard procedures. A total of 2911 students and 70 physical education teachers from 28 different schools and 116 pre-service teachers participated in this survey.

- **Approach**- The researcher approached different English medium schools from Pune city. A complete idea about the survey to be conducted on students and physical education teachers was given to the school authorities. A brief background of the work to be done was provided to the selected students and physical education teachers who gave their oral assent and participated readily.

For collecting data from pre-service teachers, the researcher approached the selected teacher training college and briefed the student-teachers about the study. The student-teachers who showed their willingness were sampled.

- **Data Collection Tools**- Data of the attitudes of students and teachers was collected using the scales developed by investigator. Brief information of the scales is given below.

  - **Students’ attitudes toward physical activity and physical fitness (SAPAPF)** -
    The scale consisted of six subscales measuring different dimensions of attitudes. Each subscale had 8 statements to be responded on five point Likert scales ranging from strongly agree to strongly disagree. The scoring of the positive statements ranged from 5 for strongly agree to 1 for strongly disagree and that of negative statements ranged from 1 for strongly agree to 5 for strongly disagree. The attitude score for each subscale ranged from minimum 8 to maximum 40 where higher score meant more positive attitude. (Appendix VII)

  - **Teachers’ attitude towards teaching physical activity and physical fitness (TATPAPF)** - The scale consisted of a total 20 items to be scored on five point Likert scale ranging from 5 points for strongly agree to 1 point for strongly disagree. (Reverse scoring pattern was used for negative statements). Minimum 20 and maximum score of 100 could be obtained on this scale where higher score meant more positive attitude. (Appendix VIII)
• **Scale administration**- Scale was administered considering the convenience of the school, teachers and the students. The scale was distributed to the teachers and students. The researcher read the instructions from the scale to all the students and teachers to maintain consistency and also asked to again read the instructions and the test items carefully. They were encouraged to respond to the statements honestly and genuinely. They completed the scale within a span of 30 to 35 minutes. Similar procedures were adopted in the data collection from the pre-service physical education teachers.

Out of the total 2911, many of the data had to be discarded on the grounds of incompleteness. A total of 2606 students who completed the scale in full were considered for the data analysis. All the in-service and pre-service teachers provided completed data and were analysed for the purpose of this study.

**3.5 Statistical Techniques**

Various statistical tools were used in different phases of the study. Validity of the scale was established using content validation ratio, and reliability was established using Cronbach alpha and coefficient of correlation.

For the purpose of comparing the attitudes, data was analyzed using descriptive and inferential statistical techniques. Under descriptive statistics, mean, standard deviation and standard error of mean was computed for attitude scores in different groups of students’ and teachers’. To compare the differences in attitude scores within different groups of students and different groups of teachers, ANOVA and Scheffe’s post-hoc test was used. To study the relationship between teachers’ and students’ attitudes Pearson coefficient of correlation was used.
References


