CHAPTER III

METHODOLOGY

In India, Physical Education profession needs spurt in research activities for proper growth and development to match international standards. The multi-dimensional approach in research can only meet such requirements. Extensive research carried on fitness, training methods, exercise physiology and sports psychology have undoubtedly contributed significantly to draw out the standard of physical education and sports, yet a number of areas still remain untouched. Research work, which may contribute towards development of basic knowledge, is one of the most important areas which really inspire and motivate the people to involve themselves increasingly in physical education and sports activities.

The researcher has endeavoured to highlight the relationship of knowledge of health and participation in physical activities to respective academic grade of senior secondary school students.

This chapter gives the details of methods and methodology applied to investigate the aforesaid areas. The first problem, confronted by the researcher, was non-availability of appropriate tools which could be used for the purpose. Therefore, the procedure was bifurcated into two phases:

1. Development of the questionnaire which may serve as a tool to assess the knowledge of health and physical activities so that their relationship with academic grade may be worked out.

2. Procedure to be followed in identification of subject areas and collection
Development of the Questionnaire

The questionnaire was developed to measure:

1. Knowledge of health
2. Participation in physical activities.

Knowledge of Health Questionnaire

First step, in the direction of development of the questionnaire, was to develop entirely a new questionnaire. A number of books, journals and sample questionnaires were consulted. Pilot studies were undertaken to assess the extent of knowledge of the teachers and the students as well as the areas covered in the field of health education, because instruction in health education is not imparted in schools as a distinct discipline. On the other hand, it is undertaken more in an incidental manner than regular instruction. The studies served as the basis for the development of the questionnaire regarding knowledge of health.

An attempt was made to prepare 150 multiple choice questions on the basis of knowledge, thus acquired, so as to draw a rough draft of the questionnaire. Multiple-choice question is composed of short or incomplete question or statement followed by three to five potential answers.129

The questionnaire comprehensively covered the area of nutrition, anatomy and physiology, community health, communicable diseases and general health

and hygiene.

Various trials were carried out and modifications were successively made to give the final shape to the questionnaire. The detailed description of each trial follows as under:

**First Trial**

The questionnaire was distributed among the Directors of Colleges in the last week of February, 1985, who had assembled at Lakshmibai National College of Physical Education, Gwalior, in a seminar. The first trial was carried out purposely on the professionally sound people with a view to inviting maximum criticism and expert opinion regarding the applicability of the questionnaire; and know the extent of their knowledge of health. The questionnaire was administered by the researcher herself; and subjects were requested to ask for any clarification they needed. It was observed that the language of majority of questions in the questionnaire was difficult. Consequently, the subjects could not respond to the questionnaire in true perspective.

The questionnaire was modified in the light of criticism and suggestions offered by the subjects. Elements of the questionnaire were classified into several sections.

In the first part, those questions found place which attracted request for clarification from 50% to 70% of the subjects. The questions, on which 30% to 50% of the subjects demanded clarification, were placed in the second part. The third section included the questions which did not require any clarification by the subjects.

The first section of forty-eight very difficult questions was completely
discarded. However, the questions of second list were modified to make them more intelligible. Consequently, 102 questions were left for the second trial.

**Second Trial**

The second trial was carried out on Physical Education Teachers of Delhi belonging to the school cadre. The questionnaire was attempted by them in the presence of the researcher. They were also allowed to seek clarification pertaining to language of the question. A free discussion was held with them in the end pertaining to the questions and degree of difficulty.

Outcome of the second trial was discussed with the guide and other prominent persons in the field of physical education and health education so as to cut down the number of questions and modify the questionnaire, in order to make it more intelligible and understandable to the subjects who shall ultimately attempt the questionnaire.

**Third Trial**

Before the conduct of the third trial, another attempt was made on school students to ascertain the response of the subjects towards questionnaire. Since there is a wide gap of knowledge, and command over the language between students and the teachers several new problems regarding the structure of language, reflection of meanings; and sense were encountered. Such problems were again discussed, at length, with the guide and other well-acknowledged knowledgeable persons in the field of physical education. A dire necessity was also felt to provide Hindi version of the questions.

Consequently, analysis technique, by using discriminative power of an
item, was employed which is a modified method based upon the biserial $r^{130}$. The total number was scrutinized and reduced to fifty as a result of item analysis. The validity of the questionnaire was also obtained by means of logical validity.

**Fourth Trial**

The fourth trial was conducted on twenty five girls and twenty five boys of an age group, which the study was intended to cover. The students belonged to two different schools of Delhi. Necessary instructions were given to the students before they attempted the questions.

A period of one hour and thirty minutes was allowed as time for filling up responses to the questionnaire. Students were instructed not to ask any question during first hour. However, they were permitted to seek clarifications during the remaining period of half an hour. It was observed that very few students came up for clarifications.

Some minor adjustments were made after the fourth trial; and final shape was given to the questionnaire comprising fifty questions to be replied in one hour's duration. The responses were rated on one hundred score scale which served as raw data regarding knowledge of health. The questionnaire is annexed as appendix I.

**Participation in Physical Activities**

The questionnaire was developed to collect data pertaining to participation of school students in sports and games at various levels. A list of all the games wherein competition is conducted by Delhi Administration and School Games

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$^{130}$Ibid P. 67 and 284.
Federation of India was proposed.

According to the norms of School Sports and Activities Board of Delhi and School Games Federation of India, a competitor can take part in two games only - at any level of competition.

Therefore, the students were requested to tick (✓) any two of the listed games which may reflect their best performance at the highest level - School/Inter-house or Intramural, Zonal/Inter-school, Inter-zonal/State competition and National School Games/National Championships. The questionnaire is appended as appendix II.

Participation in physical activities was rated on one hundred score scale. The lowest and highest limit of participation was school level and national level competitions respectively. The highest level of participation of the student was taken into account for award of marks.

Responses to the questionnaire formed raw data regarding participation in physical activities.

**Procedure**

Delhi Administration, from educational point of view, was then divided into four districts. Each district had approximately equal number of schools under its territorial jurisdiction. Admission plan of each district is printed every year at the beginning of each session for the purpose of admission to classes VI, IX and XI.

The researcher collected the admission plans from all the four districts
and used the "random sampling"\textsuperscript{131} method for selection of schools. The list of schools is appended as appendix - III.

The investigator visited all the four districts and exchanged her views with the Deputy Directors of Education regarding her project work. The conversation covered the details regarding selection of schools, procedure regarding conducting tests, time expected to be consumed and other facilities required for the tests.

\textbf{Administration of Questionnaire Regarding Knowledge of Health}

Meeting of physical education teachers of concerned schools and supervisors (physical education), were called in each district.

It was explained that only the 12th class students should appear in the test regarding knowledge of health. Lists of 12th class students were collected because their academic grades were also required.

The investigator got an opportunity to meet the same group of all the four districts on "Children's day" celebration rehearsals. A meeting was called at Chhatarsal Stadium, Model town (13th November, 1986 at 3 p.m.), to fix up the dates and places, where the questionnaire could be delivered for onward transmission to schools. The schedule was prepared. Physical education teachers cooperated whole-heartedly in administering the questionnaire.

Requisite number of copies of the questionnaire were delivered at the schools centre as per schedule. Copies of questionnaire were further distributed

among the respective schools according to the strength of class XII.

During the period, 7th January to 28th February 1987, the researcher went from school to school to conduct the test in her presence and collect the completed questionnaires personally. Attendance of the students was verified, absentees were struck off. The test was administered during the schools hours.

The respondents were given instructions regarding the procedure to be followed in answering questions. They were assured, before administering the test, that their responses would not influence their results. It was emphasized that they should tick (✓) the response after careful reading of the question; and avoid over writing.

**Administration of Questionnaire Regarding Participation in Physical Activities**

The questionnaire related to participation in physical activities was administered simultaneously with that related to knowledge of health. Therefore, instructions were given collectively. In addition, it was advised that the students should fill up the questionnaire carefully because their responses regarding participation in various level competitions would be verified from the official records of the department of Physical Education and School Games Federation of India; whereas, the Zonal/Inter-school level participation would be verified from the school records.

The investigator met Shri C.L. Negi, Organising Secretary, School Games Federation of India in Delhi (3rd & 4th January 1987), and discussed her project with him. He was kind enough to extend his cooperation to allow the researcher to have access to the official records of students participation from Delhi
for the year 1986-87; and instructed his staff to cooperate fully.

The researcher verified the responses related to 'State level' competitions from Physical Education Branch of Delhi Administration, Delhi, for the year 1986-87.

In all 4,650 questionnaires were distributed according to schoolwise strength. Forty students left school due to the transfer of their parents and forty two students absented themselves on the day of the test. Consequently, 4,568 responses were received back. Out of the total receipt 2,215 and 2,443 were from boys' and girls' group respectively.

**Evaluation**

The questionnaires on the 'knowledge of health' were marked with the help of two professional colleagues. The correct answer sheets were handed over to them for the purpose. Each correct response carried two scores.

Highest score limit for 'participation in physical activities' was fixed at fifty; and minimum at ten in one game (Appendix IV). However, the students were allowed to indicate their performances in not more than two games.

Central Board of Secondary Education declared the results of Senior Certificate Examinations 1987, in the month of June. All the heads of the schools except seven, were kind enough to send the copy of the result by post. The results of the remaining seven schools were collected from the gazette notification of Central Board of Secondary Education. The scores were converted into percentage, rounded off to the nearest whole number.

The raw scores of 'knowledge of health', 'participation in physical
activities' and 'academic grade' in percentage, were tabulated separately for boys and girls (appendix - V).

Statistical Tools Applied

The 'mean' and the 'standard deviation' of all the twenty four girls' schools and twenty four boys' schools were worked out, individually related to the three variables, then the same was collectively worked out for boys and girls separately and lastly it was worked out collectively taking subjects as one population.

Descriptive analysis\textsuperscript{132} was used to find out the variability or spread of scores.

Inter-correlations were worked out between the three variables in order to find out 'Zero order correlation'\textsuperscript{133} between the two variables at a time. The relationship among the three variables was established separately (boys and girls) and collectively using the 'zero order correlation.'

'Partial correlation'\textsuperscript{134} was worked out from 'zero order correlation' to find out the correlation between the two remaining variables after 'partiallying out' one of the three variables to see their mutual effect. The partial correlation was worked out separately for boys and girls besides the whole sample.

\textsuperscript{132}Ibid, pp. 12-17.


\textsuperscript{134}Ibid, p. 239.
'Multiple correlation'\textsuperscript{135} (\(R\)) has been used to find out the joint effect of knowledge of health and participation in physical activities (independent variables) on academic grade (criterion). The joint effect through multiple correlation was found out for boys, girls and the whole sample.

The predictive value\textsuperscript{136} (\(E\)) has been used to find out the merit of variables in terms of percentage. \(E\) has been worked out for the whole sample, boys and girls separately.

The 't' test has been used to find out mean difference between boys and girls on knowledge of health, participation in physical activities and academic grade. The "'t' test is a preferred measure for interpreting the significance of difference with small samples, equivalent to critical ratio."\textsuperscript{137}

The test of significance was set for all calculations at .01 level of confidence.

\textsuperscript{135} Ibid p. 239.
\textsuperscript{136} Ibid p. 259.