CHAPTER-III

DESIGN AND METHODOLOGY

Methods and techniques are important pre-requisites of any study. It is necessary to give the details of gathering the material and the technique followed in a particular study. The present study is an investigation in which researcher conducted the study to established the relationship among self-concept, somatotypes and sensation seeking anxiety state in body builders and weight lifters.

In this chapter sample, tools used, criterion measure, administration of test and statistical design has described.

Sample

It is not possible to collect the data from whole population. A random sampling was adopted to collect the required data. For the present study, 125 male All-India intervarsity level body builders and 125 male All India intervarsity level weight lifters each were selected between the ages of 18 to 25 years.

The data were collected between the period 18th January, 2008 to 28th January 2010, from the various university players who had participated in All India Inter-University Weight Lifting & Power Lifting (Men & Women) and Best Physique (Men) Championship.

Criterion Measures and Collection of Data

Recording the variables as given below shall consist data in the form of various criterion measures selected for the study.
**Informed Consent**

Any questions, comments, or a informed consent form was administered by the researcher to participants during their athletic practice prior to their completing the other surveys. The purpose of the informed consent form is to obtain permission from each of the participants in their willingness to partake in this study. The form indicates exactly what the study demands, what the participants can expect from the study, the minimal risks and benefits of their participation, and the guarantee of confidentiality. It also states the participants ability to withdraw from the study at any time without penalty and provides the researcher’s contact information if concerns arise.

**Demographic Information**

This form obtained information from the participant regarding their date of birth, height, weight, sport in which they compete (body building & weight lifting) and number of competitive years they have been involved in the sport. It was administered by the researcher to the participants who completed it before a scheduled practice.

**Psychological Inventories Used in the Study:**

**Physical Self Perception Profile (PSPP)**

The Physical Self-Perception Profile is a multidimensional 30-item self report instrument measuring an individual’s physical self-concept. It developed by Fox, 1990. It features four domain-specific subscales assessing perceived sport competence (SPORT), body attractiveness (BODY), physical condition (CONDITION), and physical strength (STRENGTH), and one subscale that assess a global perception of overall
physical self-worth (PSW). A four-choice structured alternative item format is used with six items per subscale. The subject is first asked which kind of person best describes them (e.g., “Some people always have a really positive feeling about the physical side of themselves” BUT “Others sometimes do not feel positive about the physical side of themselves”) and then to decide to what degree they are that kind of person (e.g., “Sort of true of me” or “Really true of me”). The result is a four choice response. The PSPP was administered to participants in this study by the researcher during a scheduled practice. Scoring the PSPP involves adding the scores of each subscale. Each response is assigned a value of 1 to 4 points. Each subscale, SPORT, CONDITION, BODY, STRENGTH, and PSW, contains six items ranging from 6 to 24. The negative items are reversed so that the lowest-scoring descriptor is placed first, and items from each of the sub domains are placed in sequence within the complete profile. Therefore, high scores reflect high self-concept. All the subscales have three positive and three negative items except for the STRENGTH subscale which contains four positive and two negative items. An example of a negative item from the SPORT subscale is: “Some people feel they are not very good when it comes to playing sports BUT others feel they are really good at just about every sport.” A positive item from the CONDITION subscale is: “Some people make certain they take part in some form of regular vigorous physical exercise BUT others don’t often manage to keep up regular vigorous physical exercise.” A negative item from the BODY scale is: “Some people feel that compared to most their bodies do not look in the best of shape BUT others feel that compared to most their bodies always look in excellent physical shape.” A positive item from the PSW subscale is: “Some people feel extremely satisfied with the kind of persons they are physically BUT
others sometimes feel a little dissatisfied with their physical selves.” Lastly, a positive item from the STRENGTH subscale is: “Some people feel that they are very strong and have well-developed muscles compared to most people BUT others feel that they are not so strong and their muscles are not very well developed.” Test-retest findings for this instrument have been reported by Fox (1990) with test-retest reliabilities ranging from .74 to .92 over a 16-day period and 0.81 to 0.87 over a 23-day period.

1) Sensation Seeking and Anxiety State Test (SSAST)

Investigator used the Sensation Seeking and Anxiety State Test developed by Neary and Zuckerman (1976). The tool consists of 36 statements in which 15 items were regarding Sensation Seeking (SS), and 15 items were for Anxiety State (A). The remaining six items were the items from the anxiety scale that did not meet the factor analysis criteria. The scoring varies from 1 (not at all) to 5 (very much) for each item (range=15 to 75). The item no. 5, 9, 14, and 25 are scoring reversed, i.e. 1 (very much) to 5 (not at all). They have shown high internal consistency and low retest reliabilities of the SSAST (Sensation Seeking and Anxiety State Test). It is a Likert type 5 points scale and its reliability in reported to be 0.93.

Equipment for Somatotypes

Anthropometric measurements to determine the somatotypes of each athlete were taken by using the following instruments.

(1) Weighing machine;

(2) Stadiometer;

(3) Vernier Caliper;
(4) Measuring Tape;

(5) Skin Fold Caliper.

Following anthropometrical measurements were collected from the body builders and weight lifters using standard equipments and techniques:

**1) Weighing Machine to determine the Body Weight**

The body weight of the subjects was examined on a portable weighing machine to the accuracy of 500 gm. The pointer of balance is set at zero and individual was asked to stand in the centre of the platform of machine with minimum clothing i.e. (shorts only), the reading was recorded from the dial.

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**2) Stadiometer to determine the Standing Height**

Standing height of the subject was measured with the help of Stadiometer. It is a vertical distance from the vertex to the horizontal ground, the stature was measured with a anthropometric rod, and the measurement was taken with the subject standing straight against an upright wall, touching with hills, buttock and back. The head was oriented in the frontal plane (the upper boarder of the tragus of the ear
or the trogion and the lower border of the eye socket were on a horizontal line) and the heels were together, and the hands were hanging downward. The subject was stretched upward by a gentle traction on the ground. The anthropometric rod was held vertically in front of the subject in mid-segittal plane and the horizontal movable bar was brought down to touch the point vertex. The height was recorded to the nearest of millimeter.

(3) Vernier Caliper to determine Diameters

(a) Biepicondylar humerus diameter:

The subject’s right arm was raised forward to the horizontal and the forearm flexed to right angle at elbow. The distance between medial and lateral epicondyle of the humerus was measured with the help of Vernier caliper and the value was recorded.
(b) Biepicondylar femur diameter:

The subject was made to sit on a stool and the right leg was flexed at the knee to form a right angle with thigh. The distance between medial and lateral epicondyle of the femur was measured with the help of Vernier caliper and the value was recorded.
(4) Measuring Tape to determine Muscle girths

(a) Biceps muscle girth:

The subject was made to raise his right arm to the horizontal position in the sagittal plane with the fully supinated forearm flexed at the elbow. The subject was encouraged to ‘make a muscle’ by fully contracting his biceps. The measurement was taken with the help of measuring tape wrapped at right angles to the long axis of the upper arm where the maximum girth was affected.

(b) Calf muscle girth: The subject stands with feet slightly apart. Place the tape around the calf and measure the maximum circumference.
(5) Skin Fold Calipers to determine Fat Percentage

(a) Triceps skin fold:

The mid acromiale-radiale line on the posterior surface of the right arm was marked and the skin fold about one centimeter above marked level was picked up and jaws of the calipers were applied to the fold and after waiting for 2 to 3 seconds the reading was taken. One more reading was taken in the same way and average of the two was the final score.

(b) Sub scapular skin fold:

A point below the right scapula was marked. The skin fold about one centimeter below marked level was picked up and jaws of the caliper were applied to the fold and after waiting for 2 to 3 seconds the reading was taken. One more reading was taken by the same procedure and average of the two was the final score.
(c) Supraspinale skin fold:

A point was marked on a slightly diagonal fold on the crest of the ileum at the midaxillary level, the skin fold about 2 to 5 centimeter above marked level was picked up and jaws of the caliper were applied to the fold after waiting for 2 to 3 seconds the reading was taken. One more reading was taken by the same procedure and average of the two was considered as the final score.
(d) Medial calf skin fold:

The subject was made to sit on chair with knees bend at right angles. Medial side of the right calf, slightly above the level of the maximum girth was marked. The skin fold above the marked level was picked up and jaws of the caliper were applied to the fold. After waiting for 2 to 3 seconds the reading was taken. One more reading was taken by the same procedure and average of the two was considered as the final score.
Somatotype in gradings

Carter and Heath (1990) method was applied to determine the somatotype of subjects.

(a) **Endomorphy**

\[
\text{Endomorphy} = -0.7182 + 0.1451* \Sigma SF - 0.00068* \Sigma SF^2 \\
+ 0.0000014* \Sigma SF^3
\]

[Where \( \Sigma SF \) = (sum of triceps, sub scapular and supraspinale skin folds) multiplied by (170.18/height in centimeter). This is called height-corrected endomorphy and is the preferred method for calculating endomorphy.]

(b) **Mesomorphy**

The equation used to calculate mesomorphy is

\[
\text{Mesomorphy} = 0.858 * \text{humerus breadth} + 0.601 * \text{femur breadth} + 0.188 * \text{corrected arm girth} + 0.161 * \text{corrected calf girth} - \text{height} * 0.131 + 4.5
\]

(Subtract the triceps skin fold and calf skin fold from the arm girth and calf girth, respectively).

(c) **Ectomorphy**:

Ectomorphy was determined by comparing the HWR ratio with following underlined values.

\[
\text{HWR} = \frac{\text{Height in cm}}{\sqrt[3]{\text{Weight in Kg}}}
\]

➢ If \( \text{HWR} \) is greater than or equal to 40.75 than

\[
\text{ectomorphy} = 0.732 * \text{HWR} - 28.58
\]
➢ If HWR is less than 40.75 and greater than 38.25 then ectomorphy = 0.463 * HWR – 17.63

➢ If HWR is equal to or less than 38.25 then ectomorphy = 0.1

**Statistical Procedure:**

To reach at the inference of the present empirical investigation the researcher sequentially arranged the raw data into a tabular format and go through description statistical analysis to know the mean and standard deviation followed by t test to established differences between means of the body builders and weight lifters scores. Pearson product moment of coefficient correlation to established relationship between the scores of body builders and weight lifters. All statistical process was done through the Statistical Package of Social Sciences (SPSS) version 16.