CHAPTER II

REVIEW OF RELATED LITERATURE

1. Anthropometric studies on Elite athletes and Ethnic groups.

2. Physical performance and Physical Fitness

3. Method of Classification

4. Physique and Body proportion.

5. Personality studies
REVIEW OF LITERATURE

Plenty of research literature is available in the field of test-measurement and evaluation; so also in anthropometry and areas like physical fitness, method of classification and body type. Everyday the research studies and their reports are pouring in and getting available from one corner to another corner of globe.

The present study encompasses the areas like, evaluation, fitness, anthropometry and personality profile; hence the review is here undertaken of research literature from the concerned areas, as listed below:

1) Anthropometric Studies on Elite Athletes and Ethnic Groups.
2) Physical Performance and Physical Fitness.
3) Method of Classification.
4) Physique and Body Proportion.
5) Personality Studies.

These areas had been under rigorous investigation of the research scholars world over for more than half a century. As the present study is related basically to a personality whose work was established before half a century, the review under this chapter contains the studies from the contemporary period up to the present decade.
1) **Anthropometric Studies on**

**Elite Athletes and Ethnic Groups:**

The anthropometric studies on elite athletes and ethnic groups were found to have been conducted as early as 1929.

Soon after the 9th Olympic Games at Amsterdam in Holland, the study was published in 'Research Quarterly', in the year 1929, contributed by Kohlrausch. He examined 300 athletes at Amsterdam in respect of their age, height, weight and vital capacity. Body types of these athletes were also studied by him. While grouping the athletes as per their events he worked out their weight/height index and mean values. He observed that the best 22 sprinters in the world had their mean weight 142.3 lbs and 67.9" height with weight/height index of 2.17 and vital capacity of 4300 c.c. As compared to sprinters, the 400 mts runners were found slightly taller (69.2"), heavier (143.7 lbs) and more linear (2.10) with 4500 c.c. vital capacity.

In this way Kohlrausch worked out the mean values of the above parameters for the long distance runners, jumpers, vaulters, hurdlers and middle distance runners. On the basis of their body build, he classified and grouped athletes of various sports into three categories: viz.

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1) Slender Types - Runners, Jumpers, Hurdlers, with relatively long leg and slender bodies.

2) Massive Types - Weight throwers, Weight lifters, Wrestlers and up to a point Gymnasts.

3) Medium Types - Decathlon and Pentathlon athletes, Boxers, Ball players and Swimmers.

Very interesting studies based on the anthropometric data of athletes of 1932 and 1936 Olympic Games were contributed by T.K. Cureton.¹ His observations were based on a variety of physical measurements of these athletes. He pointed out that the sprint-swimmers were forceful, testing high in arm, leg and body strength. The American swimmers were taller than average and presented close approximations to 343 and 454 somatotypes. The middle distance swimmers were found by him to be unusually superior in vertical and horizontal floating capacity with great vital capacity and more than the average amount of adipose tissue. According to him, their relatively great floating capacity was suggestive of their light bones and less dense muscular tissue, a trend toward endomorphy. He cites a few examples of the Olympic athletes and predicts their somato-type; Teroda, the 1936 Olympic 1500 metre champion, as per his estimation, would approximate a 552 somatotype;

Uto, his teammate, would be a 462; Modica 1932 Olympic 440 yard champion would approximate a 352; Ralph Flanagan would be appraised as a 353. Makino, and Kitamura, 400 metre and 1500 metre stars of the Japanese Olympic team of 1932 would be 345 types. The Hawaiian stars, K. Makama and B. Mala, American champions at 220, 440, 880 yards and the mile were observed very small men, strong and wiry, who rode very high in the water. He estimates them as 355 types. There were no extreme ectomorphs or endomorphs in the competitive swimming group which he observed all were found average or above in straight, the Sprinters tending towards ecto-mesomorphy and the middle distance swimmers toward endo-mesomorphy.

Adams\(^1\) while noting the difference between working and non-working women, observes that the hard working women grow taller than non-working women. They are much heavier than the non-working women. They have longer muscle girths due to constant exercising of muscles by work and so are better developed. Their chests exceed the non-workers' in all measurements, which lead to the conclusion that the chest is also better developed in

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the hard workers. The knee, joint and the hip width bitrochanteric are stimulated by hard labour and are better developed.

He further observes that the skin measurements (Chest depth, shoulder, biacromial) and hips (bi-iliac) all seem not been stimulated to greater physical growth and development by hard labour, although all but one show a difference in favour of the hard working subjects. The difference is too small to enable one to conclude that this was due to the stimulation of hard work.

On the basis of his observation, Adams comes to a general conclusion by stating: "It is probably safe to say that constant exercise of a body part through hard labour or through any other form of exercise which is strenuous enough to stimulate these parts into vigorous action, will cause these parts to grow and develop more than they would grow had they not had this exercise, provided the exercising of these parts is not carried to an extreme".

Steggerda and Petty compared two racially different groups which were alike in vocation, age, height, weight and chest measurements. In all the other body

1 Ibid., p. 103.

proportions considered, some significant differences were observed between the two races. The most obvious of these differences as found in their study were as follows:

1) All linear measurements of appendages were larger in Negroes than in the Whites.

2) The span in Negroes was nearly 105 percent of the stature; in Whites it was only 99.4 percent.

3) Negroes had a longer lower arm in relation to upper arm than did the White.

4) Trunk length in Whites was greater than in Negroes; on the other hand in the Negroes, trunk was more V-shaped than the Whites' trunk because of larger biacromial and smaller intercrestal breadths.

5) Negroes had longer faces than Whites; their heads were more dolichocephalic, their noses broader, and their ears more circular.

6) The incidence of caries among these Negroes is half that of the Whites.

A study related to race and stature was conducted by Jones on Los Angeles school children. He observed that at 58" height Mexican girls were 0.7 pounds lighter than the Whites, Japanese girls 2.3 pounds lighter and Negro girls

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1 Orren Lloyd Jones, "Race and Stature; A study of Los Angeles School Children", R.Q., Vol.XII, No. 1, March 1941, p. 83.
were found 2.5 pounds lighter than Whites (all groups 58").

His study over the White and Negro girls of 58" height was
limited to the age group of 10 to 15 years, for White and
Mexican girls the age group was 10 to 16 years and for White
and Japanese it was 11 to 16 years.

He further states that if the matter of age
coincidence is disregarded the average weight for height
could be obtained, i.e. the Negro 7 lbs lighter than the
White, while the Mexican and Japanese could respectively 2
and 1 lbs heavier than the Whites.

Regarding age-height-weight as parameters, with
their all shortcomings are still used in schools,
gymnasiums, camps, etc. as a rough gauge of physical
development in children according to Jones. He further
asserts that to formulate any general rules for the
preparation of age-height-weight table for any single race
to be based among any other race, is impossible.

During the period of forty's the studies in
Anthropometry seemed to have received prominence in research
literature. Margaret et al.¹ had conducted study on
anthropometry of young women, highlighting subtle

¹Margaret Bell, Dorothy Beise and Byron O. Hughes,
1941, p. 560.
differences in the size, shape and structure of nasal profile suggesting racial heterogeneity.

1 Carpenter had his anthropometric study on masculinity and femininity of body build, which according to him, would be useful in analysing the characteristics of body build of outstanding performance.

Another interesting study related to comparison of structure and function of normal, pronated and painful feet among children, was conducted by E.D. Kelly2.

He examined the three types of feet in respect of their flexibility, strength and out-toeing angles. Differences over these parameters were pointed out by him.

While pointing out sex differences in anthropometric measures of college students, Sturzebecker3 observes in his study the significant difference in the mean weight of 18

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year and 21 year old students, which he indicated by a critical ratio of 2.90. The mean height of 18 through 21 years boys showed no significant difference. The insignificant difference in height was observed in groups of girl students of same age group.

Peter Everett and F.D. Sills¹ in their study observed higher multiple correlations of body weight, height, the mesomorphic component and an anthropometric measurement of the hand with hand grip strength. They further observed that when other variables were held constant, the age showed little influence upon grip strength.

Clarke² has found the high relationship of girth of flexed-tensed upper arm, an anthropometric measure, to strength test variables and arm strength criteria. Another anthropometric test, body weight, was also found prominent in the multiple correlation. In the conclusion of his study, Clarke states that the height of the individual adds significantly to his ability to score well on arm strength measures.


Walter Kroll\textsuperscript{1} conducted an anthropometrical study on varsity wrestlers. His data brought out the fact that the American collegiate wrestlers' body type was very different from the body type of European Greco-Roman and Professional wrestlers. He attributed this difference in body type to the style of wrestling practised by the two categories of wrestlers.

Physical check-up through anthropometric measurements commenced in Hanuman Vyayam Prasarak Mandal,\textsuperscript{2} Amravati (Maharashtra), in 1918. Gradually, due to acquisition of experience, the process of check-up has undergone few changes.

2) Physical Fitness and Physical Performance:

Physical fitness related to performance has been a subject of research enquiry since more than half a century. Some of the outstanding names associated with this subject in early thirties and forties were Cozens, Sargent, Cureton and so on. Their work in this field is appreciated and referred even today.


\textsuperscript{2}H.V. Deshpande, "Vyayam Tatwa Darshan", Amravati, H.V.P.M., 1946, p.97.
Cozens\textsuperscript{1} in one of his works had studied the stature in relation to physical performance of college men, where he observed negligible correlation between age and height and between age and weight. In the same study he presented his own method of classification based on slender, medium and heavy frames in each of the three groups of men, viz., tall, medium and short.

D.A. Sargent\textsuperscript{2} had studied the physical characteristics of athletes and found that the sprint runners were typically light boned men with relatively long limbs and full-chested bodies. He opined that a relatively long foreleg would be helpful to sprinters in their performance.

According to Cureton\textsuperscript{3}, the classification based on constitutional type grouping provide a basic framework for the understanding of health of many types of physical fitness and athletic performance. Somatotyping procedures could become a valuable basis for the understanding of individuals, opined Cureton.

\textsuperscript{1}Frederick W. Cozens, "A study of Stature in Relation to Physical Performance", R.Q., 1:1, March 1930, p.38.


An effort to correlate anthropometric measures and the physical fitness with the physical fitness scores obtained from a few C.R. endurance tests like Tread-mill, Step test or Pack test, was made by Seltzer\textsuperscript{1}, but he found that these measures were uncorrelated with each other. Body weight was found uncorrelated in the treadmill test and negatively correlated to a low degree in the pack and step test.

In a study of differential analysis of sit-ups, Wedemeyer\textsuperscript{2} found no significant relationship between sit-ups and strength and weight. He concluded that body build did not have any important bearing on the sit-ups as a test of strength and endurance. His observation reveals that no significant increase in strength is possible even after increasing number of sit-ups, when strength reaches a certain level.

Book Walter\textsuperscript{3}, while studying the relationship of body size and shape to physical performance, observes positive influence of these factors on performance. He further observes that the thin boys of average size perform better than medium physique boys of average size; the very


Similar study was conducted by Perbox\(^1\), wherein he attempted to find out relationship between somatotype and motor fitness in women. He observed endomorphy as the dominant component in women; but those opting physical education as a major trend, had more dominant mesomorphic traits than did those enrolled in service courses. In the context of motor fitness components and somatotyping, the study further revealed no relationship between somatotype ratings and trunk extension; significant relationship between mesomorphy and knee push-ups; a negatively significant relationship between endomorphy and knee-push-ups particularly when the mesomorphic component was not prominent. Also, inverse relationship was found between endomorphy and the Illinois agility run when mesomorphic component was low.

In his classical study regarding relationship of strength and anthropometric measures to physical performance involving the trunk and legs, H. Clarke\(^2\) brought forward some of the revealing facts of high intercorrelation, for example, standing height with leg strength, foot length with leg length, body weight with both hip width and thigh girth.

\(^1\)Joyce A. Perbox, "Relationship between Somatotype and Motor Fitness in Women", R.Q., Vol. 25, No. 1, March 1954, p. 84.

The highest strength test intercorrelation was between trunk flexion and extension. He also calculated multiple correlations found to be significant between leg lift and body weight, ankle dorsiflexion strength and trunk flexion strength, back lift with knee extension strength, and knee flexion strength; standing broad jump with adipose tissue over abdomen found negatively correlated and hip-extension strength positively correlated.

Brer and Galles\(^1\) have suggested toe-touch test as an indicator of hip and back flexibility for the average body build. Their observations reveal that those persons with a longer trunk-plus-arm measurement and relatively short legs have an advantage in the performance of this test; whereas those with long legs and a relatively short trunk-plus-arm measurement are at a disadvantage.

Nagpur University\(^2\) seemed to have practice of assessing physical health and physical fitness with the help of special formulae. To find out the physical health and physical fitness of individual, following formulae were developed and used by the Board of Physical Welfare of Nagpur University.


a) \[
\frac{W}{(H)^2} \times \frac{100}{85} \times \frac{A}{C} = \text{(If the abdomen is more than Chest)}
\]
b) \[
\frac{W}{(H)^2} \times \frac{85}{100} \times \frac{C}{A} = \text{(If the abdomen is less than Chest)}
\]

Note: The reply 2 or above indicates better health/fitness status. The value below 2 indicates poor fitness status.

\[
W = \text{Weight in kg} \\
H = \text{Height in cm} \\
C = \text{Chest girth in cm} \\
A = \text{Abdomen girth in cm}
\]

3) **Method of Classification:**

Classifying the students into different homogeneous groups for physical education classes and competitions, on the basis of some components of growth and development, has been a practice in the field of sports and physical education since long. Age, height and body weight are very easily available components and have been popularly and extensively used by many experts in the field. Some of the earlier studies coupled with recent ones are reviewed hereunder.

Bovard and Cozens\(^1\) referred to the practice which was prevalent prior to 1917 of classifying pupils into homogeneous groups based upon weight like light weight, middle weight and heavy weight; but it was noted to be

inadequate for the purposes, as utility of other factors such as age and height was also identified in classification. In this respect, a pioneer study of Reilly\textsuperscript{1} was of great significance. He developed a plan, for classification of boys and girls, known as age-grade-height weight plan with the object to fairly match them for competition. According to his plan, boys and girls are to be classified broadly into junior (5th and 6th grades) and seniors (7th and 8th grades) based upon the grades of instruction to which they belong. A table for each of these classes is to be referred to score an exponent for each of the factors of grade, age (years), height (inches) and weight (pounds). Depending upon some of the exponents scored by an individual boys or a girl, five groups A, B, C, D and E can be made of all the students in junior and senior classes.

Based on Reilly scheme of classification, it was in the year 1918, another scheme called California Plan\textsuperscript{2} was developed. This plan provided age-grade-height-weight classification for homogeneous grouping of high school boys for competition in decathlon events. A scoring table for the exponent of each of the four factors viz. grade, age (years and months), height (inches) and weight (pounds) was

\textsuperscript{1}F.I. Reilly, New Rational Athletics for Boys and Girls, Boston: D.C. Heath and Co., 1917, p. 62, Quoted by Ibid., p. 119
\textsuperscript{2}Ibid., p. 123.
Provided. A placement is given to a boy in any of these a, b, c, or d classes according to the group norms on the basis of sum of the exponents. This plan of classification is meant only for boys.

Delaney¹ evolved a formula for classification of junior high school girls. His 10 Age + Weight formula correlated better with performance than age alone under 14 years of age. He made slight change in the said formula by replacing height for weight to suit it for girls of 15 years and above (10 age + height).

Classical study in the field of classification is attributed to McCloy² who observed that in predicting athletic ability, height was of no significance in case of elementary school boys, when age and weight were used and age ceased to make any contribution at 17 years and after, while all the three factors were of greater validity for the high school level.

Accordingly, he recommended three indices meant for three different categories of pupils:

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²Ibid., p.48.
1) For High School Level:

\[ \text{Index I} = 20(\text{Age}) + 5.5(\text{Height}) + .15(\text{Weight}) \]

2) For College Men:

\[ \text{Index II} = 6(\text{Height}) + \text{Weight} \]

3) For Elementary School:

\[ \text{Index III} = 10(\text{Age}) + \text{Weight}. \]

Classification Index I was stated to be changed arbitrarily by McCloy himself later on. The new Index I was \(20(\text{Age} + 6(\text{Height}) + \text{Weight})\).

McCloy's study seemed to have met with criticism. But, his study served as base. However, a few modifications were suggested to his formulae. Neilson and Cozens\(^1\), after conducting a study on a large number of pupils in California, had suggested the formula which was slightly different than McCloy's. Their formula was:

\[ 20(\text{Age}) + 4.33(\text{Height}) + \text{Weight}. \]

It was subsequently modified by the same authors to read as

\[ 20(\text{Age}) + 5.5(\text{Height}) + 1.1(\text{Weight}). \]

It was known as Neilson and Cozens Index, for which a chart was provided for easy computation of index.

\(^1\text{Ibid., p. 46.}\)
Cozens et al.\(^1\) seemed to have done a rigorous statistical exercise on their earlier formula and could develop five indices framed separately for running, Jumping, throwing, weight and strength and kicking ability. Each one of them is represented with a separate formula as under:

a) **Running Index**:
   
   
   \[20 \text{ Age} + 9.78 \text{ Height} + 1.26 \text{ Weight}.
   
   
   b) **Jumping Index**:
   
   
   \[20 \text{ Age} + 5.02 \text{ Height} + 1.13 \text{ Weight}.
   
   
   c) **Throwing Index**:
   
   
   \[20 \text{ Age} + 2.07 \text{ Height} + 1.77 \text{ Weight}.
   
   
   d) **Weight and Strength Index**:
   
   
   \[20 \text{ Age} + 5.48 \text{ Height} + 1.97 \text{ Weight}.
   
   
   e) **Kicking Index**:
   
   
   \[20 \text{ Age} + 1.41 \text{ Height} + 1.87 \text{ Weight}.
   
   The final formula which was derived from the average of five indices stated above, runs as follows:

   \[20 \text{ Age} + 4.75 \text{ Height} + 1.60 \text{ Weight} \div 10\]

From this formula, another formula was evolved to indicate the best fit index, which is stated as follows:

\[ \text{B.F.I.} = 2 \times \text{Age} + 0.475 \times \text{Height} + 0.16 \times \text{Weight} \]

It is evident from the literature that in India too, work on classification was carried out. J.P. Thomas\(^1\) reports existence and use of classification index for Indian schools in earlier decades, particularly in Madras and Bombay states. A formula used for classification of Indian boys was:

\[ 1\frac{1}{2} \times \text{Height} + \text{Weight} \]

Joseph\(^2\) refers to following classification formula in his work:

\[ 4 \times \text{Age} + \text{Height} + 1/2 \times \text{Weight} \]

Another formula with age + height + 1/10 weight was recommended by Thirunarayanan and Hariharan\(^3\) to be tried in Indian schools.

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Nagpur University\(^1\) seemed to have practice of classifying the students for physical education classes and sports competition with the help of following formula:

\[ W - H + C + \frac{2}{3} (A - 25) + \sqrt{7 - (C - ab)} \]

Another interesting study related to method for classification of girls in secondary schools of Bangalore city, was conducted by M.A. Shakuntala\(^2\). She framed a classification index using factors of age, height, weight. Accordingly two choices were suggested as follows:

**First Choice**

Classification Index = \(0.13\) Age (Month) + \(0.53\) Height (cm) + \(0.33\) Weight (kg)

**Second Choice**

Classification = \(0.55\) Height (cm) + \(0.38\) Weight (kg)

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4) **Physique and Body Proportions**:

Physique has been referred to an individual's body form, or more specifically, the conformation of entire body as opposed to emphasize on specific features.\(^3\) It has been

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related to a variety of behavioural, occupational, disease and performance variables.

Assessment of physique has been a subject of enquiry and investigation since more than half a century. Methods used to assess physique are varied, ranging from traditional anthropometric to sophisticated measurement of body composition.

Height and weight, independently or relative to each other are perhaps most commonly used anthropometric dimensions in physical assessment.

Apart from height and weight, other commonly used anthropometric dimensions related to body proportions of limb length, sitting height, bi-acromial breadth, condylar breadth of femur and humerus and limb circumferences are accurate indicator of various body proportions and build.

Anthropometric measurements show their relationship with body structure, physical characteristics and sports capabilities. This knowledge of mathematical correlation permits sports physician to evaluate and predict performance potentiality on the basis of physical characteristics and specific requirements of games.¹

In their study on national level archers, Sunderrajan et al.\textsuperscript{1} concluded that physical measurements i.e. height, weight, biaxial diameter and arm length were correlated with the performance of the individual archers at the varying distances. Further, it was concluded that physical measurements correlated also with the total performance scores.

Many studies have been reported on exposing relationship of physical performance with age, height and weight; so also selected anthropometric measures.

Espen Schade\textsuperscript{2} studied the relationship between physical performance of school children to age, height and weight. The purpose of the study was to evaluate these factors for grouping of students and for the establishment of norms for the performance. It was observed that where the age is held constant, relationship of all performance with height, weight were low. Highest correlations were obtained for boys of junior high school in the events of jumping and throwing; significant changes with age do occur in most events of both sexes. Age is recommended as a basis


for test norms. If grouping according to size is desired, the California classification is superior.

In an attempt to develop scientific criteria for the selection of budding athletes based on their morphological status, Kansal\(^1\) studied 246 male students ranging in the age from 11 to 17 years. Their height, weight, biacromial, humerus bycondylar, chest and calf circumferences and performance in 100 meters running, shot-put and standing broad jump were recorded and examined. He concluded that above said body measurements showed different degree of relationship with individual performance tests studied. Further, with the help of this differential role, preparation of selection criteria for choosing budding athletes at a young age was also attempted.

Back\(^2\) utilized data from 87 male students of high school to determine the relationship of selected anthropometric and physical performance measures to performance in the running Hop-step and Jump. He concluded that all the variables as measured in the study showed significant relationship with criterion beyond the 0.05 level of confidence.

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While studying the relationship between anthropometric measure and the motor fitness test, it was found low and insignificant. However, a significant relationship was observed between shot-put and shoulder width and weight with neck girth respectively.\(^1\).

Out of the various parameters of body measurements, body weight and height had received much attention of the earlier research workers in determining physique and body composition as well as in relating them with sports performance. Height and body weight are traditionally the basic units for quantification of size of the human body. A combination of the two gives insight into proportional size.\(^2\)

It was on these two parameters that the Ponderal Index was evolved, which was used frequently as a general indicator of linearity or laterality. Ponderal Index\(^3\) is calculated by:

\[
\frac{\text{Height in inches}}{3} \div \text{weight in lbs}
\]

\(^1\)Marcel Hebbelinck and John W. Postma, "Anthropometric Measurements, Somato type Ratings and certain Motor Fitness Tests of Physical Education Majors in South Africa", R.Q., Vol.34, No.3, October 1936, p. 327.


Variations in individual weight are a very valuable indication for estimating athletic fitness and the influence of training on the athlete's health. During the season it is useful to establish a weight curve for each individual in which ideal weight and fitness weight are the comparative terms. Ideal weight may be ascertained from the established nomograms. Fitness weight is a more practical but empirical figure to be obtained by comparison between athlete's performances and weight variations over a previous season. Variation falling up/down to the ideal values indicate a correct training programme, whereas a minus deviation may show a beginning staleness before any clinical symptom appear. On the contrary increasing weight may reveal a training insufficiency.

Body weight has thus been used more extensively than any other anthropometric test in physical education. Body weight has formed basis for arm strength formulae; it has been a basic factor in constructing strength norms, with age and height, it has been used in classification indices and athletic exponent plans. It has frequently been the criterion measure in nutrition type tests.

1 Encyclopedia of Sports Sciences and Medicine, Weight Control, p. 266.
Realising its multifarious role in health and fitness, efforts were made to evolve the method or formula for predicting body weight. Quimby\(^1\) devised a weight prediction formula. The basic formula is:

\[
EW = a(\text{Height}) + b(\text{Shoulder width}) + c(\text{Chest width}) + d(\text{Chest depth}) + e(\text{Hip width}) - f
\]

Cureton (1941)\(^2\)- Nordstrom Skeletal Index purports to evaluate skeletal size and predict body weight on the basis of measurements of chest breadth, ankle girth, chest depth, hip width and height. Raw scores are inserted into quick-scoring table to give five figures that are added, and then a constant is subtracted from the total.

Ludlum and Powell (1946)\(^3\) also had given weight prediction formula for Wellesley College women. On the basis of height, chest depth and chest width the following regression equation was derived:


Weight = 2.6 (Height + Chest depth + Chest width) - 154.3

Kokardekar (1937) worked out weight predicting formula for Nagpur University students. The formulae are:

1) \( H + 2C + \frac{2}{3} (A - 25) = \text{Weight} \) (Above 25 years)

2) \( H + \frac{7}{4} C = W \) (18 to 25 years)

3) \( H + \frac{3}{2} C = W \) (Below 18 years)

\( H = \text{Height in inches} \)
\( C = \text{Chest girth in inches} \)
\( A = \text{Actual age} \).

5) **Personality Studies:**

Personality studies are of varied nature. Some of them are of biographical type, some are dealing with the work and contribution; some portray philosophy and life-style, others deal with the psycho-social aspects, a few others working on their career and personality traits. On the basis of collected data, a biographical sketch is prepared or by studying the type of service rendered to the society and the type of traits, personality profile is prepared.

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Personality studies or biographical type in physical education are very rare in India. Much of the studies on personality are there based on 16 PF inventory. Personality traits of coaches, athletes, physical education teachers and other social workers are studied mostly with the help of 16 PF inventory and are numerous. Biographical studies are found in other fields like literature, art and music. A few studies from physical education and other fields are reviewed hereunder:

Gooch (1973)\(^1\) conducted a study to investigate the personality traits of highly skilled Basketball and Softball women athletes. Evidence indicated that there was relationship between personality and physical performance. Variations in personality were found between successful and non-successful women athletes and between intercollegiate and non-intercollegiate women athletes.

Parsons (1964)\(^2\) employed Cattel 16 P.F. questionnaire to national representative swimmers in Canada in 1962. The result of this study revealed that champion swimmers differed from the average population in 15 of the 16 factors. There appeared to be no difference in personality

\(^1\)Foster Euie Gooch, "Personality traits of Highly Skilled Basketball and Softball Women Athletes", Completed Research in Health, Physical Education and Recreation, 15:64, 1973, p.78.

between champion swimmers selected to represent Canada in 1962. The champion swimmers apparently possessed marked extreme scores on personality factors.

Berger and Littlefield (1969)\(^1\) made an effort to determine the differences in personality, as measured by the California Psychology Inventory (C.P.I.). The test was administered to 30 outstanding football athletes after controlling for scholastic aptitude as measured by the scholastic aptitude test. Insignificant differences in C.P.I. score were found between outstanding athletes, non-outstanding athletes and non-athletes.

Gaur (1980)\(^2\) undertook a study to find out the personality characteristics of the urban and rural adolescent students. After making a comparative study of fourteen personality characteristics, significant differences were found between the two sets of adolescents.

McGlynn (1980)\(^3\) designed a study to measure the personality characteristics of teachers for the purpose of


comparing successful and less successful teachers in Naval Technical Training School. The major findings of the study were as follows:

1. There were no significant differences found in the personality assessment between either the successful or less successful teacher groups.

2. There were no significant differences found in the research selected variables of age, sex, months of Naval experience and months of teaching experience between either successful or less successful teacher groups.

A study of personality traits of experienced coaches was undertaken by Malhotra and Khan¹ (1984) on a sample of 30 experienced coaches of football and cricket. The following were the findings of the study;

1. Experienced coaches tended to be suspicious, doubtful and a few of these coaches suffered from fluctuations of mood.

2. Some of the coaches had tendencies towards introversion and most of the coaches were normally active, emotionally stable.

Victor (1982)\(^1\) identified personality traits of university football players and selected university students. From the results of the 16 P.F. questionnaire, it was unlikely that personality alone could be used to select superior football players.

Amusa and Udoh (1984)\(^2\) determined whether athletic participation would affect the personality traits of athletes and non-athletes. It was pointed out that significant differences in the personality traits of males versus females in this study could be due to social acceptability and femininity factors.

Alam and Srivastava (1983)\(^3\) administered an adjustment inventory, extroversion introversion scale and sleep (S.S.) questionnaire on 120, 17-21 old undergraduates to examine relationship between SS personality type, adjustment and frequency of nightmares. Results showed that nightmares were more frequent among SS with poor adjustment and introverted SS. There was no significant interaction found

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\(^3\)R.C. Alam and Ramji Srivastava, "Nightmares in Relation to Personality Types and Adjustment", Perspective in Psychological Researches, 1983, 6(2), p. 100.
between personality type and adjustment at any significant confidence level.