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**COMPARATIVE STUDY OF SELECTED
ANTHROPOMETRIC VARIABLES BETWEEN
WOMEN HANDBALL AND BASKETBALL
PLAYERS**

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Comparative Study of Selected Anthropometric Variables between Women Handball and Basketball Players

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Abstract – The points of the present study were: a) to decide the anthropometric variables between Women Handball and Basketball Players b) to think about the mean scores among sports and c) to recognize conceivable contrasts in relation to competition level. A sum of 518 female athletes, all individuals in B and H sport teams partook in the present study. Twelve anthropometric measures required for the count of body composition indexes and somatotype segments were gotten by built up writing. Anthropometric variables of female team ball players shifted among sports; selection criteria, hours of training and sport-particular physiological requests amid the game could clarify the watched contrasts. More information is absolutely expected to characterize the anthropometric profile of B and H female athletes internationally.

INTRODUCTION:-

Successful competition in sports has been connected with particular anthropometric attributes. For example, the significance of tall stature in team sports athletes is all around acknowledged as it is notable that body height impacts decidedly all body portion lengths and, thus, athletic execution. Along these lines, there is an abundance of experimental proof and a longstanding investigative enthusiasm in regards to the presence of basic contrasts among athletes in different sports.

In team sports, exceptional consideration has been paid to morphological qualities of Olympic athletes to the detriment of national level athletes. Also, the quantity of studies managing the anthropometric qualities of female ballplayers is somewhat little in contrast with male athletes. A few studies that have broke down morphological attributes of world class female basketball (B), and team handball (H) players exist in the writing, yet the majority of them don't inspect the entire range of morphological qualities, since they need either anthropometric or body composition or somatotype estimations. It is additionally important that a great deal of estimations reported in the work of Carter(2001), Eiben(2001) Spurgeon et al.(2002), had been directed long back, in the decade of 1970-1980. From that point forward, a few parts of athletic training and nourishment, and in addition the selection strategies for sport abilities have experienced critical changes and upgrades, bringing about improvement of athletic execution.

In B, a portion of the directed studies are very old while the latest ones either treat information of B players together with information from other ball games or are restricted to female athletes of formative ages. The latest study by Monyeki (2008) has managed B and H players from the African substance, where, notwithstanding, these sports are not at a high focused level. Concerning this athletic populace of female B players, there is no distributed examination paper displaying information on this territory. A study on morphological attributes of female B players was sought after by Geladas and Maridaki (2006). In H, examinations identified with morphological qualities of female players are very rare and old.

In perspective of the little example sizes and/or the inadequate number of variables concentrated on, and also the lack of up and coming anthropometric values in the studies on female players of ball games, it is important to gather extra broad information to build up "sport-particular" body composition and anthropometric reference values for tip top female B and H players. The points of the present study were: a) to decide the anthropometric profile, body composition and somatotype of world class female B and H players, b) to analyze the mean scores in relation to sport (examination among B and H); and c) to recognize any conceivable contrasts in relation to competition level.

There are numerous studies that explored the advancement of the anthropometric parameters for basketball and handball players. As indicated by these studies, amid the most recent decades there is a propensity among the first class basketball and handball players demonstrating an expansion in their height. As a rule, the tip top basketball and handball players are heavier and taller than the normal ordinary populace. Then again looking at the first class basketball and handball players to the superior athletes of different sports (football, hokey, judo and badminton), the basketball and handball athletes appear to be essentially heavier, taller and with less hefty mass than the hokey, judo and badminton ones. Also, there are a few studies that reported correlations between anthropometric attributes and the position of the player amid the game. All the more particularly, the goalkeeper, the back players (entomb) and the players on the 6m line (turns) are fundamentally taller than the playmakers (focus) and wing players. Nonetheless, the previously mentioned studies concern the general handball playing capacity of a competitor and not the correlation of the execution of a particular on-court errand to the individual anthropometric variables. By knowing this bit of data, it is conceivable that athletes having a particular anthropometric profile are performing better (or more regrettable) on a particular assignment.

As indicated by this study, the length of the hand ought to square with at any rate the width of the ball to accomplish a most extreme execution. By and by, a more solid parameter that could be a critical component for the dependability of getting a handle on the ball is the width of the hand from the thumb to the fifth finger when the fingers are stole. It is still obscure whether this anthropometric variable that depends both upon the hand size and the finger kidnapping adaptability is related to the tossing speed. Considering the above, obviously there is a great deal of discussion in the conclusions when attempting to recognize the careful anthropometric variables that the tossing speed is related to. The reason for this study was to look at any conceivable correlation between the anthropometric qualities and the throwing speed.

METHODOLOGY

A total of 355 female athletes participated in the present study after having signed a written consent. The sample was comprised of female athletes who were chosen from different cities nationwide and included all the players belonging to the Women of B and H. The number of subjects in each sport was as following: 133 from B and 222 from H. The mean chronological age, training experience and frequency of practice.

Anthropometric measures -

Body height (BH) was measured with a stadiometer to the nearest 0.1 cm and body mass (BM) was recorded

using a portable scale to the nearest 0.1 kg. Skinfold measurements were taken using a skinfold caliper from five sites: biceps, triceps, subscapular, suprailiac and calf, according to standards set by Carter and Heath¹ to the nearest 0.1 mm. The mid-upper-arm circumferences (cm) were measured with the arm in both tensed and relaxed position, while calf circumference (cm) was measured with the subject sitting at the end of a table, and having her legs hanging. Also, two widths, femur and humerus, were measured to the nearest 0.1 mm (reported in cm). All variables were measured on the right side of the body following standardized procedures. Two measurements were taken from each site and the value recorded was the mean, provided that there was a difference of no greater than 5% between the two measurements; if that was the case, a third measurement was taken and the median value was used. All skinfold measurements were taken indoors at approximately the same time of the day by the same investigators.

PROCEDURE -

All measurements were taken amid competition season. Six physical instruction graduates were particularly taught and prepared three times each week for four months, so as to qualify as master staff to lead the measurements required in the present study. Toward the end of the training period their capacity was assessed by means of the reproducibility and objectivity of their measurements. They all deliberate the same subjects in four back to back days; the two people with the most astounding intraclass correlation coefficient (0.93 and 0.91) and the littlest coefficient of variety (2.2 and 2.6%, individually) were led the real measurements. The technical error of measurement (TEM) from repeated measures was 0.382 cm for height, 0.285 kg for body mass, 0.761 mm for biceps, 0.498 mm for triceps, 0.783 mm for subscapular, 0.675 mm for suprailiac and 0.969 mm for calf skinfold thickness, 0.484 cm for femur and 0.564 cm for humerus width, 0.447 cm for calf circumference, and 0.682 cm and 0.516 cm for relaxed and tensed mid-upper-arm circumference, respectively.

Body mass index (BMI) and height-weight ratio (HWR) were calculated with the following equations,

respectively: $BMI = BM / BH^2$, $HWR = BH / \sqrt[3]{BM}$. The sum of five skinfolds (biceps, triceps, subscapular, suprailiac, calf) was also computed as an indicator of body fatness. In addition, the sum of four skinfolds (4SKFS) (biceps, triceps, subscapular, suprailiac) was used for the determination of body density (BD) which was made taking chronological age into consideration.

Statistical analysis -

Means and standard deviations were calculated separately for each sport. Two-way (sport X competition level) multivariate analysis of variance (MANOVA) was performed to examine possible significant differences in all anthropometric, body composition and somatotype variables among the various groups of athletes. This was followed by post hoc Scheffe's multiple comparison tests in order to identify pair-wise differences between groups in each dependent variable. The level of significance was set at $p \leq 0.05$.

RESULTS

There was a noteworthy ($p < 0.05$) general impact of the sport in every anthropometric trademark (with the exception of femoral measurement). The mean and standard deviation (mean $\pm$ SD) of fundamental anthropometric attributes for B and H, and also the distinctions distinguished in these parameters among the three sports. B players were taller ($p < 0.001$) than H players, paying little mind to the competition level.

Be that as it may, H players who were the most limited ($p < 0.001$) of all had additionally the least ($p < 0.001$) values in body mass. They likewise had the most astounding ($p < 0.01$) values in all skinfolds, when contrasted with the players of the other two sports. Furthermore, B players had higher values in biceps bigness either in the strained or in the casual position.

The general impact of sport was huge ($p < 0.05$) in all body composition parameters. The total of 5 skinfolds and additionally the rate body fat was essentially diverse ($p < 0.05$) among all the three sports analyzed paying little heed to the competition level. H players had the most noteworthy ($p < 0.001$) values in these two variables and B players had lower ($p < 0.001$) values contrasted with H. The most reduced ($p < 0.001$) fat free mass was seen in H players, though B players had comparable values in this variable, yet diverse ($p < 0.05$) fat mass.

DISCUSSION

In the present examination concentrating on anthropometric qualities, body composition indexes, and somatotype parts among female B and H players, from two competition levels, huge contrasts were distinguished in a large portion of the variables concentrated either among all the three or between just the two sports.

It is the first occasion when that an extraordinary number of tip top female ballgame players from the same nation are inspected inside the same learn at a wide range of morphological qualities, accordingly permitting correlation among sports free from financial,

social and ecological impacts. Moreover, these information will add to the reference bank of anthropometric attributes of female ballgame athletes giving up and coming values to future testing and assessment. B athletes were taller and leaner than H players, with their somatotype being portrayed as mesomorph-endomorph. H athletes were the most brief of all, had the most elevated rate of body fat and their somatotype was mesomorph-endomorph.

Anthropometric-

B and H require tall athletes, since body height impacts emphatically all body portion lengths and, thusly, execution is influenced. The huge contrasts found in body height among the three researched sports could be represented by a more strict selection of youthful athletes and, also, in B. In H, it appears that body height is not a paradigm for selection of athletes, since the mean value of this variable recorded in the present study is lower than the comparing values in the other two sports, and is near the mean values of body height found in the standards of female women at 18 years old yrs (162.63 cm).

The legitimacy of communicating body fat as rate of body weight has been condemned. In this way, in the present study we computed likewise the entirety of five skinfolds as an option body fat record. Notwithstanding the way communicating body heftiness, the present results demonstrated the same picture in each of the three gatherings of subjects. Rate of body fat changed among the three gatherings of athletes, with the V players introducing the most reduced values, and the B players having lower values than the H ones. Strikingly however expected, in general in the three sports, body heftiness was conversely related ($p < 0.05$) to the hours of training reported by the mentors.

An examination of the rate body fat saw in this study with relating values of different athletes, who, be that as it may, were of various age and competition level, demonstrates that our subjects, in every one of the three sports, had higher body fat. All the more particularly, with respect to B, lower values of body fat have been accounted for in National Team athletes, in more youthful athletes, and also in athletes of ball games as a rule, though values like our B subjects' have been discovered just in a gathering of College B athletes and higher values have been measured in a team of medium class players.

The unexpectedly high percentage body fat observed in the Greek female athletes of team ball games, and particularly in B and H players is further substantiated by the following two observations: Firstly, in some cases of these athletes the BMI values reach those of

overweight women (25 kg/m^2). In the present study, BMI was 23.2 kg/m^2 in B and 23.6 kg/m^2 in H players, values which are the highest reported in the literature, since the corresponding BMI values measured either in National Team or in medium class players lie in the range between 21.0 and 22.6 kg/m^2 , in B and between 22.1 and 22.8 kg/m^2 , in H. Secondly, the percentage body fat values seen in our sample of ball game athletes, and particularly in the H players (25.9 ± 3.3), seem to be very close to the mean value observed in a female population (24.9%) of similar age ($18-29$ yrs) participating in recreational physical activity classes.

It would be normal that the athletic populace of our study would have very lower rate body fat than these women, who are not athletes, since methodical athletic training contributes considerably to the lessening of body fat while expanding the incline body mass.

By and large, in the examination papers researching female athletes of international level, B and H athletes have been introduced as mesomorph-endomorph profiles have not changed even in the latest studies.

The observing that bulk is most significant in H, furthermore in B athletes is very intriguing, especially in light of the perception that H athletes had the least years and minimal volume of training contrasted with the athletes of the other two sports. Be that as it may, from the three sports analyzed in the present study, H is portrayed by the most serious body contact, continuous and compelling crashes and, moreover.

CONCLUSION

In conclusion, critical contrasts were found in the vast majority of the inspected anthropometric qualities, body composition parameters and somatotype parts either among the female athletes of all the three or between just the two sports tried in the present study. H players, then again, were the briefest of all with the most elevated values in body fat and endomorphy; they had the most elevated mesomorphy too, additionally the best heterogeneity in their somatotype. The values of B athletes in height and rate of body fat was in the middle of the other two gatherings of athletes with higher mesomorphy and endomorphy.

The athletes of the higher competition level were taller, leaner, and heavier and their gathering was more homogenous in somatotype attributes. More information is unquestionably expected to characterize the anthropometric profile of team ball game female athletes and, additionally, to permit examination of values among sports and in addition among athletes of different nations and different competition levels.

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