Journal of Advances and Scholarly Researches in Allied Education
Vol. 18, Issue No. 6, October-2021, ISSN 2230-7540

A Review on suggest a framework to players & coaches for determining the range of anthropometric measurements

Badole Rajendra Haridas[1]*, Dr. Atul Shukla[2]

[1] PhD Student,Kalinga University, Raipur (CG)

[2] PhD Guide, Dept. of Physical Education, Kalinga University, Raipur (CG)

Abstract - Sports have gained recognised as an easy, inexpensive, and effective way to accomplish important developmental goals due to their widespread appeal. A motivating aspect of PE is sport-specific instruction. Learning to compete in a healthy way can help students grow in many ways, including physically, emotionally, socially, & morally. Today, the greatest methods to rise through the social ranks & gain admiration from your peers are to excel at sports and other competitive games. These days, people's lives, and indeed many aspects of society, revolve around sports and gaming. Playing a sport means engaging in physical activity with the goal of winning, improving one's performance, having fun, or a mix of these and other similar objectives. Anthropometric methods are used to collect data on a player's physical build, while paper-and-pencil examinations can evaluate a player's physiological & psychological attributes. Numerous professional sports milestones are attainable by players with the right combination of anthropometric, physiological, psychological, and physical fitness characteristics. In particular, the psychological component of anxiety has significant bearing on the outcome of the game. Team tactics & player positions are additional factors that influence a team sport's outcome in addition to anthropometric, physiological, psychological, & physical fitness. Knowing the anthropometric profile state of a volleyball player is vital since it helps players maintain a healthy body.

Keywords - Anthropometric Variable, Anthropometric measurements, Anthropology, Volleyball

----------X----------

INTRODUCTION

Sports have been recognized as a simple, low-cost, & effective medium for reaching essential developing goals because of its widespread appeal. The sport-form component of our physical education infrastructure is truly motivating. In competitive settings, students can improve their physical fitness, interpersonal skills, and moral character through participation in physical education. The best method to get ahead in today's culture is by participation in competitive sports and other games. The contemporary period has given sports and games a central role in people's lives and in every aspect of society. Sport is any form of physical activity engaged in for reasons including, but not limited to, the following: competition, enjoyment, skill improvement, or the pursuit of perfection. Different sports require different sets of individual or team talents, and they also compete in different ways. Fitness and sports go hand in hand, thus it's important to hone one's skills so they can compete at a high level on a regular basis (Kumar 2017). A motivating component of the framework for PE is sports. Motor skill is equivalent with physical prowess in this context. Several elements interact to provide optimal athletic performance. Power, speed, agility, balance, reaction time, etc. are all crucial qualities needed in players, and in most developed countries, parents are keenly aware of the importance of providing their children with ample opportunities to develop these skills from a young age. Knowledge, survival, & highest possible physical condition all necessitate research. Education, like any other institution, has a responsibility to adapt to changing times. Looking at education in its Indian context reveals that it is well-established and aims high. To ensure that pedagogical practices are current, it is essential to conduct research in all fields. As a field of study, Physical Education requires constant revision so that it can continue to provide the answers that emerge from investigation of emerging trends. Analysis of research trends provides a clear picture of the state of the field, revealing such information as what topics are receiving the most attention and what has already been explored. What are the benefits and drawbacks? are among the topics it attempts to address (Sudhakara, G. 2018).

Learning about these aspects is important for coaches & PE teachers since it allows them to tailor their instruction to each player's unique needs.

www.ignited.in

Previous studies had established without a reasonable doubt that in addition to differences in functional behavior & structure, there are also differences in the players' psychological traits. Anthropometric methods are used to collect data on a player's physical build, while paper-and-pencil examinations can evaluate a player's physiological & psychological attributes. Numerous professional sports milestones are attainable by players with the right combination of anthropometric, physiological, psychological, and physical fitness characteristics. In particular, the psychological component of anxiety has significant bearing on the outcome of the game. Team tactics & player positions are additional factors that influence a team sport's outcome in addition to anthropometric, physiological, psychological, & physical fitness (Gaur 2013).

In volleyball, like many other team sports, the court is rectangular. A volleyball court has two equal half, separated by a net. Within the court's boundaries, a maximum of six players may represent a single team. Volleyball matches must be played to a score of 25 in sets per the rules. A team is declared the victor if they take the match in the best of five sets, regardless of how many sets were played. Below, we will examine the value and utility of anthropometric, physiological, psychological, and physical fitness variables. The volleyball players and their places on the court must also be analyzed. Weight, height, and skinfold measurement are all examples of anthropometrics that can have an impact on a volleyball player & game itself. Knowing the anthropometric profile state of a volleyball player is vital since it helps players maintain a healthy body. A volleyball player can be affected & game can be affected by physiological variables such as vital capacity & blood pressure. Knowing the current state of a player's physiological profile is crucial for the success of any volleyball team. A player's performance on the court might be affected by psychological metrics like anxiety assessment. Volleyball players need to keep their mental game strong, hence tracking each player's mental profile is crucial. Volleyball players and the game itself can both be affected by physical fitness metrics including explosive strength, endurance, & agility (Singh 2016). A volleyball player's success on the court depends on his or her ability to keep up a healthy physical fitness profile.

SPORTS

A sport is an organised human activity with a defined goal & rules that are based on the historical context of the rulers who oversaw its creation. Play and the general, inherent development of an organism are the highly structured components of sports and games. One of the most basic human wants is the opportunity to express oneself freely, and this is supposedly best met through play. Modern elite sports competition is cutthroat, necessitating interdisciplinary teams of experts in areas such as sports medicine, psychology, training methods, sports coaching, and sports management to maximise each team's potential. When all chances are on the table, the mental components of athletics demand a great deal of focus. When it comes to improving performance, the athlete's mental game is king. In addition to reflecting individual & societal behaviour, sports can sometimes be a freak of nature. Typically, sports can be either a fun way to pass the time, a potentially dangerous kind of recreation, or a sign of someone who is up for a challenge (AFallahi 2013).

ANTHROPOMETRIC MEASURMENT

The term "anthropometric measurement" refers to a group of quantitative methods used to assess a person's body composition without causing harm to the subject. These methods involve taking measurements of the subject's height, weight, skinfold thickness, & waist, hip, and chest areas and then analyzing the results. When choosing players for specific sports, anthropometric measurements are crucial. Determining an athlete's body composition is done primarily for the purpose of gathering data that could be used to enhance the athlete's performance. According to research by Gualdi-Russo (2001), an athlete's anthropometric and physical qualities can be crucial to their performance in their chosen activity (Papadopoulou 2020)

Anthropometry is the study of human body type variation through the measurement of live human subjects. Regular updates to anthropometric data collections are necessary because changes in population lifestyles, diets, and ethnic mix cause changes in the distribution of body dimensions (e.g., the obesity epidemic). Examining body types and how one's physique relates to one's health, immunity to disease, posture, physical performance, and personality traits was a natural extension of anthropometrical measurement for evaluation of physical state. It quickly became apparent that there was no such thing as an ideal body type. Actually, Hippocrates was the first to notice this and divide people into two main categories based on their physique: those who are tall and slim and those who are short and stocky. In 1920, the progenitor of the contemporary body type system, Kretschmer, used an intermediate term to classify people into three categories: asthenic (slender), athletic, and pyknic (heavy).

Exercise efficiency is influenced by a wide variety of parameters, including body weight & composition. Athletes' chances of success in a specific sport may be influenced by the combination of these two elements. An athlete's strength, agility, and looks can all be affected by their body composition in addition to their weight, which can affect speed, endurance, and power. Low body fat percentages are commonly stressed within numerous sports due to the fact that most athletes require a high strength-

www.ignited.in

to-weight ratio to attain maximum athletic performance (Carter 1990)

Anthropometric & physiological measures are essential for talent detection & identification models, but only if they are measured after it is established that the relative values of the relevant variables between individuals are stable. It would also be important to account for gender differences in the timing of peak values. Since many factors, such as posture, flexibility, & speed, that are acknowledged as being vital to success in numerous sporting activities have not been examined systematically, developing such models would be difficult. Furthermore, due to the significant association that has been shown between the number of years of focused practice and success, the delayed identification of persons into sports would likely be rejected. While previous studies have shown that anthropometric and physical talent detection & identification models are better at predicting actual performance than potential, more recent studies have cast doubt on the validity of using these characteristics to differentiate between athletes. (Ross A 2001)

Athlete potential can be evaluated and predicted through anthropometric measurements. There is a strong correlation between anthropometric data and athletic performance (Wilmore 1999; Keogh, 1999). According to research by Gualdi-Russo (2001), an athlete's anthropometric and physical qualities can be crucial to their performance in their chosen activity. The player's body proportions are typically interpreted as information about the player's physical build. In this context, they might be thought of as the single most important factor in determining a player's overall ability level. Body structure, proportionality, robustness or grackle skeleton, and muscular development are all based on the anthropometric parameters of specific body segments, which can be measured either longitudinally or circumferentially (Urban, 2010). There is a correlation between anthropometric data & physical multidimensional performance abilities, which has an impact on athletes' results in competitions (Nabieh, Mohamed, 2010).

ANTHROPOMETRY AND SPORTS PERFORMANCE

Identification, paleoanthropology, the study of human physical variation, and the correlation of physical with racial and psychological traits are all areas that have benefited from anthropology. Some anthropometrics have been used by those who support eugenics and discrimination at different moments in history, frequently as part of new social movements. The field that studies human body measurement with the purpose of anthropological comparison and classification. Physical anthropology and paleoanthropology continue to use anthropometric methods, particularly to analyse evolutionary change in fossil hominid remains, despite the widespread disapproval of using anthropometric data to try to categorise humans into racial, ethnic, and national groups. (Sunil Kumar 2017)

Presently, anthropometry considers individual differences, appraises each subject relative to his structural differences and determines his potentialities in light of those structural characteristics. For optimal performance during play at an elite level, a variety of areas must be addressed. Anthropometry provides scientific methods and observation to help in finding out talent in sports. (Anthropometry means the measurement of man). There is profound positive relationship between performance in sports and the anthropometric aspects of an athlete's body. It has been scientifically proved that different sports or different events in a same sport require the demand of different bodily characteristics. (Papadopoulou, et al. 2002).

IMPORTANCE OF ANTHROPOLOGY

The scientific discipline known as anthropometry compares and analyses various human body dimensions. In order to provide an objective description of size and shape, it is necessary to take exact, highly standardised measurements. The three most fundamental anthropometric parameters are height, weight, and skin fold thickness. There is a rigorous process for taking the measurements. There seems to be a correlation between a certain body type and success in a lot of sports. Because of this, anthropometry can be utilised by trainers and coaches to ascertain the endeavour in which a person is most likely to excel. Another common method for keeping tabs on health is anthropometry.

Anthropometry constitutes the earliest form of measurement in Physical Education, as one might surmise. Study of the human physique and its proportions began many centuries ago. The early beginnings can be traced to the remote civilization of India, where a treatise called "Silpi Sastri" analyzed the outline of the body by dividing it into 480 parts. Anthropometry developed as a means to ascertain the optimal bodily proportions, with artists and sculptors focusing their research on this subject, as evidenced by the artwork of ancient civilizations. Artists were the primary practitioners of anthropometry until 1835, when a mathematician named Baron Quetelet in Brussels introduced solely mathematical techniques to determine the physical constants of the human body. He demonstrated that the binomial law, which governs probability, is applicable to human proportions. Sir Francis Galton later validated this discovery around half a century later by a meticulous analysis of measurements pertaining to specific physical constants of English males and females. In 1854, a German individual named Carus suggested using anatomical principles to establish body proportions. Soon after, Zeissing in Belgium and Cromwell in England conducted research on the development of school pupils (Gabbett & Georgieff, 2007).

The first application of anthropometry in physical education began with Edward Hitchcock in 1861, when he undertook a study of anthropometrical

www.ignited.in

measurements of Amherst College men, leading to the publication of anthropometrical tables almost annually for 40 years. The aim of anthropometry was depicted by Hitchcock as ascertaining the ideal or typical man as a guide in fostering the development of normal individuals. He provided his students with a chart showing average results associated with different variables, against which the student might plot his own results.

Variable Used for Anthropometric Measurements

Accurate and consistent measurements are necessary to acquire significant data from anthropometric measurements. Therefore, physicians must guarantee the utilisation of accurately calibrated, high-quality equipment that is periodically inspected for precision. The necessary equipment for obtaining anthropometric measurements typically includes:

- Weight scale
- Calibration weights
- Stadiometer
- Knee caliper
- Skinfold calipers
- Nonstretchable tape measure
- Infantometer to measure the recumbent length

Range of anthropometric measurements

S. No.	Variables	Range	Minimum	Maximum	Mean	SD (±)
1	Body Weight	20.28	58.46	78.76	70.07	8.48
2	Height	22.55	160.63	182.98	180.91	6.42
3	Arm Length	16.47	70.32	86.87	81.28	4.91
4	Arm Span	34.56	158.89	193.95	171.98	10.45
5	Leg Length	28.98	89.95	118.86	100.12	5.39
6	Hand Length	3.45	18.34	21.89	20.18	0.90
7	Hand Breadth	1.83	5.76	7.57	6.61	0.53
8	Palm Length	2.02	9.78	11.87	10.72	0.54
9	Humerus Breadth	1.93	5.65	7.61	6.54	0.62
10	Femur Breadth	2.13	7.92	10.07	9.01	0.64
11	Arm Girth Relaxed	8.92	20.90	30.94	25.93	2.58
12	Arm Girth Flexed	10.28	24.17	34.46	29.41	3.57
13	Chest	22.29	76.13	98.32	87.72	9.32
14	Waist	27.93	64.58	92.61	79.68	7.47
15	Hip	24.32	75.12	99.38	87.47	7.86
16	Thigh	38.59	43.42	81.97	63.86	12.98
17	Calf	9.25	30.17	39.28	33.64	2.84
18	Speed	0.53	7.49	8.08	7.87	0.78
19	Agility	1.34	10.81	11.97	19.38	1.52
20	Leg Explosive Power	0.31	1.72	1.96	1.87	0.08
21	Balance	3.78	7.08	10.89	17.47	8.63
22	Co-ordination	7.97	25.97	33.96	18.69	1.67
23	Reaction Time	0.16	0.25	0.42	0.117	0.014

CONCLUSION

The range of anthropometric measurment of volleyball players and coaches evaluated for their performance level at the intercollegiate level are part reviewed in the study. At the national & international levels of volleyball, the most important factors in a team's success are the members' technical knowledge, tactical prowess, anthropometric features, & physical performance. In terms of ideal body type, volleyball performance is superior. The range of anthropometric variables (height, weight, leg & arm lengths), psychological variables (confidence level, reaction time, breath holding time, etc.), are all thoroughly reviewed in the study. It further demonstrates the comparative evaluation in this area with regard to the four essential volleyball positions.

REFERENCES

1. Arvind Bahadur Singh, Satchidananda Behera (2013). Relationship of Anthropometric Characteristics and Kinematic Variables with Spiking of Volleyball Players. *Journal of Education and Practice.* Vol 4, No 10.
2. A.Fallahi, M.S. Ameli &H. Sadeghi (2013). Relationship between Anthropometric Parameters with Vertical Jump in Male Elite Volleyball Players Due to Game's Position. Middle-East Journal of Scientific Research, 13 (8),1016-1023.
3. Baljeet Singh and Azad Singh (2016), Relationship between structural and functional ability of Volleyball Players, *International Journal of Physiology, Nutrition and Physical Education,* 1(1): 83-85.
4. Bahari, Fahimeh et al. (2016), "Relationship between Mental Toughness and Behavioral Regulation among University Student-athletes", IOSR Journal of Sports and Physical Education, 3(4): 06-10.
5. Carter, J.E.L. & Heath, B.H. (1990). *Somatotyping - development and applications,* Cambridge University Press, New York; United States.
6. Duquet, W. & Carter, J.E.L. (1996). *Kinathropometry and exercise physiology laboratory manual.* (eds. Eston R, Reilly T), pp. 35-50. London: E&FN Spon.
7. Gualdi-Russo E and Zaccagni L. (2001). Somatotype role and performance in elite volleyball players. J Sports Med Phys Fitness, 41(2), 256-262. Urban, F. (2010). Somatotypes of Handball Players. Diploma thesis. Presov: FS PU, p-87.
8. Gualdi-Russo E, Zaccagni L. (2001). Somatotype, role and performance in elite volleyball players. *J Sports Med Phys Fitness.*41(2):256-62.
9. Gualdi-Russo, E. & Graziani, I. (1993). Anthropometric somatotype of Italian sport participants. *J Sports Med Phys Fitness.* 33(3):282-91.

www.ignited.in

10. Gaur, M.P. (2013), "Relationship between Selected Anthropometric Measurements and Performance of Women Badminton Players", Global Research Analysis, 2(8): 168-169
11. Greco, G., Giuseppe, M., Arianna, A., Antonino, P., Angelo, I., & Fischetti, F. (2019). A preliminary comparative study on the effects of pilates training on physical fitness of young female volleyball players. Acta Medica Mediterranea, 35, 783-789.
12. Heyward, V.H (2006), *"Advanced Fitness Assessment and Exercise Prescription"* (5th ed.), Champaign, IL: Human Kinetics.
13. Leake C.N. and Carter J.E.L (1991) Comparison of body composition and somatotype of trained female triathlete Journal of Sports Sciences, 9, 125- 135
14. Nabieh, A., Mohamed, I. (20[0). Anthropometric measurements as a significant for choosing juniors in Both Volleyball and Handball Sports (Factorial analysis study). World J Sport Sci., 3(4), 277-289.
15. Papadopoulou S. D., Zorzou A., Garcia-de-Alcaraz A., Rosemann T., Knechtle B. and Nikolaidis P. T. (2020), "*Subcutaneous Adipose Tissue in Female Volleyball Players: Is It Related with Performance Indices?*", Medicina, April 2020, Vol. 56(4), 159.
16. Papadopoulou, S.D., Papadopoulou, S.K., Gallos, G.K., Likesas, G., Paraskevas, G. & Fachantidou, A. (2002). Anthropometric differences of top Greek and foreign volleyball players. *International Journal of Volleyball Research,* 5, 26-29.
17. Ross A, and Leveritt M. (2001), "Long-term metabolic and skeletal muscle adaptations to short-sprint training: implications for sprint training and tapering.", Sports Med. 31(15):1063-82.
18. Ross, W.D., Carr, R.V. & Carter, J. (2003). *Anthropometry Fundamentals. In The Human Animal Serials.* Canda: Rosscart.
19. Slater, G.J., Rice, A.J., Mujika, I., Hahn, A.G., Sharp, K. & Jenkins, D.G. (2005). Physique traits of lightweight rowers and their relationship to competitive success. *British Journal of Sports Medicine.* 39:736-741.
20. Sudhakara, G. (2018) Relationship of selected physiological variables with volleyball playing ability among intercollegiate volleyball men players. International Journal of Academic Research and Development ISSN: 2455-4197 Impact Factor: RJIF 5.22 www.academicsjournal.com Volume 3; Issue 2.
21. Sunil Kumar, Pramod Kumar Yadav and Kashi Nath Yadav (2017), "*Assessment of mental toughness between volleyball and kho-kho Indian players of 12th South Asian games: A comparative study*", International Journal of Yoga, Physiotherapy and Physical Education 2017, Vol. 2, Issue 3, pp. 21-22.
22. Srivastva, G. (1994). *Advanced research methodology.* New Delhi: Radha Publications, pp. 219-220.
23. Wilmore, J.H. & Costill, D.L. (1999). *Physiology of Sports and Exercise.* 2nd ed. Human Kinetics, Champaign. Pp. 490-507.
24. Wilmore, J.H. (1982). Training for sports and activity- The physiological basis of the conditioning process. Allyn and Bacon Inc., 2, 119-137.

Corresponding Author

Badole Rajendra Haridas*

PhD Student,Kalinga University, Raipur (CG)

www.ignited.in