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Anthropometric Characteristics of the Performance Arm and Its Relationship to the Electrical Potential Difference of the Triceps Brachii Muscle for Handball Players

Rabiha Hasan Abbas*[1], Mouayad Abdullah[2], Ammar Muhi Khleel Alghurabi[3], Harith Abdelelah Alshukri[4], Ahmed Y.Saleh[5]

1 Faculty of Physical Education/ Ahl Al Bayt University/ Kerbala; Iraq
rabih1959h@gmail.com
2 College of education, Al-Farahidi University, Baghdad, Iraq
3 college of education / The Islamic University in Najaf, Iraq
4 Physical Education and Sport Sciences Department, Al-Mustaqbal University College, Babylon, Iraq
5 Department of Physical Education & Sport Sciences, AlNoor University College, Nineveh, Iraq

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Abstract

The objective of the research is to study the relationship between the anthropometric measurements of the performance arm in handball and the measurements related to the electrical muscular activity of the triceps brachii muscle. This goal was generated through the various changes in the output of muscle strength and the action of electrical effort and the difference in research in the points of influence to increase the output of force by increasing the electrical effort of the muscle. Physical Education at the University of Baghdad, and after collecting and statistically processing the data, the researcher concluded that the electrical activity is related to the great kinetic compatibility between the different parts of the body to control the output of electrical stress and increase the output of muscular strength.

Keywords: Anthropometric , electrical , potential and triceps brachii muscle.

1. INTRODUCTION

The world today is witnessing a rapid state of scientific progress that overlaps with various scientific and research factors that involve in the fields of scientific research, so every research has its own ways of treating different problems to reach solutions to those problems for creativity and overcoming difficulties.

The handball game is one of the games in which great variables are involved due to the daily developments imposed by the reality of the game and the difficulties that surround its various aspects, and since movement is the basis of play, so we find that many variables enter the research field to reach solutions to those obstacles that fall within the evaluation of roles The real professional players who have the ability to overcome difficulties and deal with the various conditions that he is exposed to while playing.[1]

The movement or what involves various performance indicators, whether external or internal, affect the performance results, and this certainly reflects negatively or positively on achieving the goal, which is the main factor in the success of the team in making progress and achieving an advanced level at the personal level of the individual or the collective level of the team.[2]

Anthropometric variables are necessary factors in estimating the growth of the individual athlete, because they are indicators for evaluating the growth of the individual in general and the athlete in particular at different age stages. Achieving the benefit of it in studying the development of the athletic human body and the formal changes that occur to it and the impact of these changes on the output of movement and accuracy in achieving advanced mathematical levels, so the study of these kinetic and anthropometric changes has a great role in the nature of movement and skillful performance of the athlete.

2. RESEARCH PROBLEM

The problem of the research is that anthropometric changes greatly affect the motor aspect and skill performance, especially at an early age, because of their impact on kinetic balance and performance results. Vital effectiveness in performance results and achieving the best levels.

3. RESEARCH OBJECTIVE

• The research objective to identify the relationship between the electric potential difference variables of the triceps brachii muscle and their relationship to some anthropometric characteristics of handball players.

4. HYPOTHESIS:

- There is a statistically significant relationship between the electrical variables of the triceps brachii muscle and some anthropometric characteristics of handball players.

5. RESEARCH FIELDS

- The human field: the university's handball team players at the University of Baghdad.
- Time range: for the period from 11/1/2021 to 3/04/2022.
- Spatial field: the football field at the University of Baghdad/College of Physical Education and Sports Sciences.

6. RESEARCH METHODOLOGY

The researcher used the descriptive approach to suit the nature of the research procedures.

7. COMMUNITY AND SAMPLE RESEARCH

The research community included (25) players, (20) players were selected from among them to represent the research community, after deporting (5) as an pilot sample.

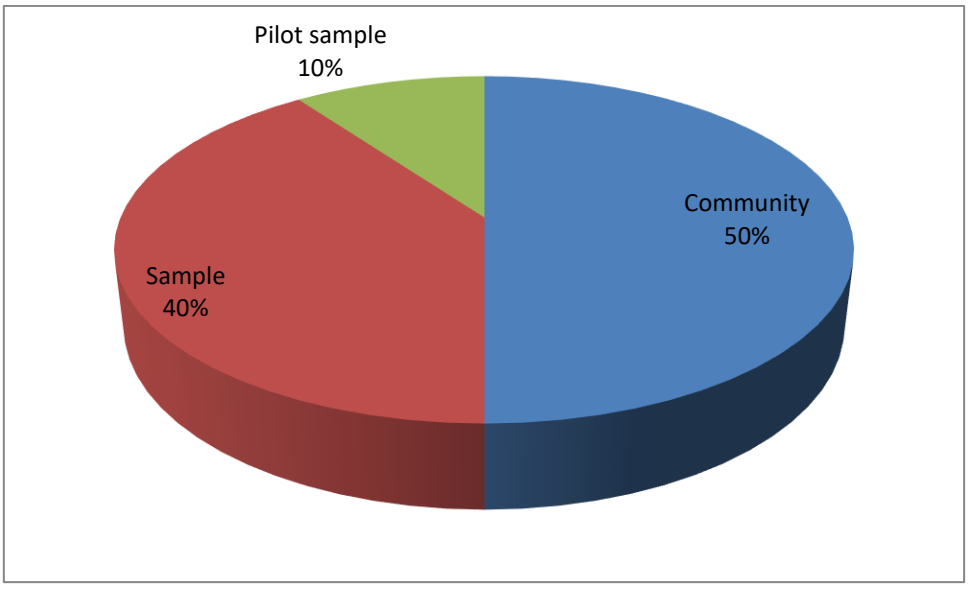

Figure 1: Shows the distribution of the research population and sample

8. EQUIPMENT, TOOLS AND MEANS USED IN THE RESEARCH

- Medical scale.
- Anthropometer tape measure.
- Electromyography device.

- Poles number (20).
- Medical alcohol.
- Medical Cotton.
- Legal handball court.
- Hand balls number(3).

9. FIELD RESEARCH PROCEDURES

Pilot study

The pilot studywas conducted on (3/11/2021) in order to control the method of research procedures and to identify the appropriate time to apply the research sample tests.

The measurements used in the research[3]

1. Anthropometric measurements

Anthropometric measurements were used for the performance arm in handball, which included arm length, humerus length, forearm length, palm length and humerus circumference using an anthropometric tape.

2. Electrical activity measurements of the triceps brachii muscle

Measurements of the electrical activity of the triceps brachii muscle included the root meansquare (RMS) and Area.[4]

10. RESULTS

Show results for search variables in Descriptive Statistics

Table 1: Show descriptive Statistics

		Mean	Std. Deviation	N
Arm length		88.7500	1.65036	20
Humerus length		38.0000	0.79472	20
Forearm length		29.9000	0.91191	20
Palm length		19.3500	0.48936	20
Humeral circumference		39.5500	3.21959	20
Electrical potential difference for the triceps brachii muscle	RMS	13.8000	0.83351	20
	Area	104.4000	1.90291	20

Table 2: Shows the relationship between anthropometric measurements and electrical potential action measurements of the triceps brachii muscle

		Arm length	Humerus length	Forearm length	Palm length	Humeral circumference	Electrical potential difference for the triceps brachii muscle	
							RMS	Area
Arm length	Pearson Correlation	1	-0.040-	0.507*	-0.342-	0.354	-0.383-	-0.050-
	Sig. (2-tailed)		0.867	0.022	0.140	0.126	0.096	0.833
	N	20	20	20	20	20	20	20
Humerus length	Pearson Correlation	-0.040-	1	0.000	-0.135-	-0.103-	-0.079-	-0.104-
	Sig. (2-tailed)	0.867		1.000	0.569	0.666	0.739	0.661
	N	20	20	20	20	20	20	20
Forearm length	Pearson Correlation	0.507*	0.000	1	-0.271-	0.396	-0.582-**	0.206
	Sig. (2-tailed)	0.022	1.000		0.247	0.084	0.007	0.383
	N	20	20	20	20	20	20	20
Palm length	Pearson Correlation	-0.342-	0.135	-0.271-	1	-0.062-	0.439	-0.102-
	Sig. (2-tailed)	0.140	0.569	0.247		0.796	0.053	0.670
	N	20	20	20	20	20	20	20
Humeral circumference	Pearson Correlation	0.354	-0.103-	0.396	-0.062-	1	-0.035-	-0.098-
	Sig. (2-tailed)	0.126	0.666	0.084	0.796		0.883	0.681
	N	20	20	20	20	20	20	20
Electrical difference for the triceps brachii muscle potential — RMS	Pearson Correlation	-0.383-	-0.079-	-0.582-**	0.439	-0.035-	1	-0.445-*
	Sig. (2-tailed)	0.096	0.739	0.007	0.053	0.883		0.049
	N	20	20	20	20	20	20	20
Electrical difference for the triceps brachii muscle potential — Area	Pearson Correlation	-0.050-	-0.104-	0.206	-0.102-	-0.098-	-0.445-*	1
	Sig. (2-tailed)	0.833	0.661	0.383	0.670	0.681	0.049	
	N	20	20	20	20	20	20	20

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

11. DISCUSSIONS

The excitation of muscle fibers requires an electrical potential difference resulting from the amount of energy the muscle possesses, and this in turn requires an increase in the number of motor units that work to produce energy with the least possible effort,[5] which generates large energy sources that have a role in maintaining the performance output and this in turn requires an increase in the size of muscle fibers And the size of the muscle as a whole.[6]

The action potential propagates along the muscle fibers in both directions and within the muscle fibers through a tubular system.[7]The control of anthropometric measurements and the action of the electrical potential of the muscle gives the possibility of controlling the production of energy and determining the time necessary for training and producing the energy needed to achieve the goal of the game or sporting activity.[8]

Through the table (2) it is clear that there is a great relationship between the length of the forearm and the square root rate, which indicates the amount of the wave frequency of the electrical signal, which the less it is,[9] the greater is the result of the force and electrical activity, so it is necessary to study all the relevant variables, especially those movements that depend on Kinetic compatibility between the different parts of the body, which is reflected in the performance output significantly.[10]

12. CONCLUSIONS

1. Anthropometric measurements have a significant role in generating an appropriate muscular effort action to control motor performance.
2. There is a great relationship between the different motor limbs of the body and the force output of the working and opposing muscles.
3. Training according to anthropometric measurements greatly affects the electrical activity of the muscles, especially the muscle under study, so it is necessary to adopt it in various research studies for training.

REFERENCES

[1] Lijewski, M., Burdukiewicz, A., Stachoń, A., &Pietraszewska, J. (2021). Differences in anthropometric variables and muscle strength in relation to competitive level in male handball players. *Plos one*, *16*(12), e0261141.

[2] Hermassi, S., Chelly, M. S., Bragazzi, N. L., Shephard, R. J., &Schwesig, R. (2019). In-season weightlifting training exercise in healthy male handball players: Effects on body composition, muscle volume, maximal strength, and ball-throwing velocity. *International Journal of Environmental Research and Public Health*, *16*(22), 4520.

[3] Zhang, Y. (2010). *An investigation on the anthropometry profile and its relationship with physical performance of elite Chinese women volleyball players* (Doctoral dissertation, Southern Cross University).

[4] Teresa, M., & Education, P. H. Y. S. I. C. A. L. (2016). Anthropometric characteristics of senior secondary school female shot put athletes in Hong Kong. *논문투고일*, *3*(23), 1.

[5] Hermassi, S., Schwesig, R., Aloui, G., Shephard, R. J., &Chelly, M. S. (2019). Effects of short-term in-season weightlifting training on the muscle strength, peak power, sprint performance, and ball-throwing velocity of male handball players. *The Journal of Strength & Conditioning Research*, *33*(12), 3309-3321.

[6] López-Plaza, D., Alacid, F., Muyor, J. M., &López-Miñarro, P. Á. (2017). Differences in anthropometry, biological age and physical fitness between young elite kayakers and canoeists. *Journal of human kinetics*, *57*(1), 181-190.

[7] Pallarés, J. G., López-Gullón, J. M., Torres-Bonete, M. D., &Izquierdo, M. (2012). Physical fitness factors to predict female Olympic wrestling performance and sex differences. *The Journal of Strength & Conditioning Research*, *26*(3), 794-803.

[8] Landolsi, M., Labiadh, L., Zarrouk, F., Maaref, K., Ghannouchi, S., Tabka, Z., &Lacouture, P. (2018). Kinematic analysis of the shot-put: A method of assessing the mechanical work of the hand action force. *European journal of sport science*, *18*(9), 1208-1216.

[9] Cochrane, K. C., Housh, T. J., Smith, C. M., Hill, E. C., Jenkins, N. D., Johnson, G. O., ... & Cramer, J. T. (2015). Relative contributions of strength, anthropometric, and body composition characteristics to estimated propulsive force in young male swimmers. *The Journal of Strength & Conditioning Research*, *29*(6), 1473-1479.

[10] Cochrane, K. C., Housh, T. J., Smith, C. M., Hill, E. C., Jenkins, N. D., Johnson, G. O., ... & Cramer, J. T. (2015). Relative contributions of strength, anthropometric, and body composition characteristics to estimated propulsive force in young male swimmers. *The Journal of Strength & Conditioning Research*, *29*(6), 1473-1479.