Effects of the Anthropometrical Variables on Swimming Performance

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ABSTRACT

Anthropometrical word generated from ancient Greek word. Anthropos represent human and matron represent measurement. Anthropology mainly purposes for the identification of human body measurement. Anthropology is systematic process which involves the primary dimensional properties of human body like body weight, Arm length, Foot length etc. Its include shape and size of the human body. In today era Anthropometrical play's major role in measurement of human body such as shape and size. Anthropometry helps in different field like clothing design industrial design. Anthropometry history contains different types of thought like such as scientific biological criminology, paleoanthropology, biological anthropology and it create correlation between mental typology personality and other factors. In different time period of history, applications of anthropometry have ranged scientific description and epidemiological analysis to rationales for eugenics for social movements

Swimming is team game and also an individual game which use the one entire body to move in the water. swimming is kind of expensive game it required large amount of infrastructure. Its only perform in open water like sea or lake and standard swimming pool.

In swimming is more popular in Olympics .in swimming different type of stroke are there like freestyle stroke, breast stroke, butterfly stroke, back stroke etc. swimmers players have to perform different kind of stroke in different event and also only in individual events, four swimmers can take part in either a freestyle or medley relay.

AUXOLOGIC

It is defined by the broad term using for the study and evaluation of different aspects of human physical terms.

HEIGHT:

Height can be defined in different terms acc to the people .in population different factors influence height of the human body such as variety of complex biological, genetic and environmental factors among others. These affecting factors also affect the measurement and also error in statistical sampling.

In the extreme population height comparison like for example: the average female height 142 .2cm and average male height is 185.6 cm.

The growth of the female height approximately from 15-18 years as well as the male height average height growth is 18-21 years.

WEIGHT

Human body weight both male and female different basically body weight depends on various factors like

mass of the bone height growth Body mass index etc.

Organs

Mostly developed brain size varies from 974.9 to 1,498.1 cm cube in female and male the average size of the brain is 1,130 to 1,260 cm cube respectively. Like different organs differ from both genders.

Measuring instruments

3D body scanners

Today era of anthropometry has three -dimensional scanners. 3d body scanners launched in march 2007 for health care purpose 3d body scanners basically used for to calculate volume and segmental volumes of an individual body scan. US used in largest amount of 3d body scanners in 2001.

Barapodographic

It's divided in main two parts

- Floor based
- In shoe form

Neuroimaging

It contains the examination of brains from corpse, or more such as MRI which can be used on living things. This kind of research commonly used on neuroscience and intelligence.

SWIMMING

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In medley relay only four swimmers perform each different stroke as order of swimming events given such as

- Backstroke
- Breaststroke
- Butterfly
- freestyle

In each of swimming stroke a set of specific techniques in competition there are also some rules of swimming suit googles and cap.

COMPETITIVE SWIMMING

Competition swimming is popular sports in today era. swimming is popular at the summer Olympic games where male and female swimmers compete each other at 16 event are held in standard pool .

In swimming there are forty official recognizes individual swimming events in the pool however the international Olympic committee only 32 official will be allowed.

SWIMMING STYLE

IN swimming there are four main style in swimming have been established.

1. BUTTERFLY

2. BACKSTROKE
3. BREASTSTROKE
4. FREESTYLE.

COMPETITION POOLS

A world standard pool size must be 50 meters (160ft) long and 25 meters (82ft) wide with ten lanes labelled from 0 to 9 or 0 to 10 in some pools, and mostly 0 to 9 are usually left empty in semifinals and finals the lanes must be at least 2.5 meters wide.

In swimming there have equipped with stating blocks at both end of the pool. mostly automatics officiating equipment including touch pads to records times and sensors to ensure the legality of relay takeovers.

The colors of the lane are like

- Two green ropes for lane 1 and 8
- Four blue ropes for lanes 2,3,6 and 7
- Three yellow ropes for lanes 4 and 5

HISTORY OF SWIMMING

The evidence of recreational swimming has been found around 10,000 years ago. And the written evidence date from 2000 bc, with some of the earliest references.

Swimming emerged as a competitive activity in 1830s in England.in 1828 the first ever indoor swimming pool was open for the public and was name is ST GEORGE Baths.

In 1837 the national swimming comities are holding all the swimming competition in six artificial pools built around the London.

Captain Matthew Webb was the first man to swim around the English Channel in 1875. He uses the technique of breaststroke to cross the English Channel. He swam the channel 21.26 miles in 21 hours and 45 min.

The first ever women swimming championship was held in Scotland in 1892.

Mean swimming became the first ever part of swimming in modern Olympic games in 1896 Athens in 1908 the world swimming association FINA (federation international de natation) was formed .in1912 women swimming was established in Olympics FINA renamed itself WORLD AQUATICS In December 2022

Swimwear and equipment

- Swimsuit
- Swim cap
- Googles
- Swim fins
- Hand paddles
- Kickboard
- Pull buoy
- Ankle bands
- Snorkel

HEALTH BENEFITS

It is a most healthy activity that can be done by most people thought of life. it is an overall body exercise. It helps to burn calories easily. The physical benefits of swimming are

- To reduce lower stress
- Occurrences of depression and anxiety
- Help in meditation
- Increase blood flow
- Tone muscles

Works on your whole body build strength

STATEMENT OF THE PROBLEM:

Effects of selected anthropometrical variables on swimming performance.

HYPOTHESIS:

There will be Significant difference between Selected swimming players of Anthropometrical variables.

OBJECTIVES:

To find the effects on performance of swimming players

SIGNIFICANCE OF THE STUDY

- To investigate the comparison in anthropometric variables among swimming players.
- The findings of the study may be helpful to analyze and classify the players based anthropometric variables.
- The findings of the study may be helpful as a review for the other research scholars.

LEVEL OF SIGNIFICANCE:

Level of significance is the predetermined level, which is used to identify real difference between the parameters of populations. A difference is marked significance when the gap between the parameters of means points to or satisfies a real difference between the parameters of populations from which the sample were drawn if $P>0.05$ then the values are taken significance.

All these statistical measures would be used for the analysis of data in the present study.

DELIMITATIONS:

- The study will be depended upon the anthropometric variables only.
- The study will be done on swimming players only.
- Only 15-28 age group of swimmer's players will be chosen.
- The participant only chosen from Lucknow.

LIMITATIONS

- The selection of the subject randomly selected from the different event of swimming.
- There is no control in diet of the swimming player.

Need and Importance of Study:

- To find out the effect of different Anthropometrical variable of swimming players.
- To find out the impact on the speed with the help of Anthropometrical variable on swimming performance

METHODOLOGY AND PROCEDURE

The Methodology and design of the study has been categorized under the following points

POPULATION:

In the present study subjects was taken from Lucknow district.

SELECTION OF SUBJECTS:

Subject -: For selection of the subjects random sampling method was used to select the subject from Lucknow District.

Area of study- Lucknow, Uttar Pradesh

For this study maximum 20 swimmers players will be selected randomly from the different stadium of Lucknow in which below 180 cm in height selected in one group and above 180 cm in height selected in other group Sampling

SELECTION OF METHOD AND SAMPLING:

Sampling methods-

The subjects were selected by using simple random sampling method from Lucknow district of Uttar Pradesh.

STATISTICAL ANALYSIS

For the purpose of analysis of the data will be descriptive and ANOVA test is used.

Purpose of study:

Effects of selected anthropometrical variables on swimming performance.

Sample size:

For this study 20 male will be selected.

Age Group:

For this study the age group of 15 to 28 years will be selected.

Selection of anthropometrical variable:

The 4 anthropometrical variables will be measured with the help of following instruments:

1. Height = Stadio meter
2. Weight = Weight Machine
3. Arm Length = Steel Metallic Tape
4. Foot Length = Steel Measuring Tape

ADMINSTRATION OF TEST
HEIGHT:

Purpose: To determine the height of the subject.

Equipment: Stadiometer, Scoresheet, Pen, etc

Procedure: Height was determined using a stadiometer. Participants were directed to stand on the stadiometer's base, looking straight ahead. The top clip of the stadiometer was positioned on their head, after which they were requested to step away in order to read the measurement.

BODY WEIGHT

Purpose: To determine the body weight of the subject.

Equipment: Wing Machine, Score sheet. Pen, etc

Procedure: Body weight was determined using a Wing Machine. Participants were directed to stand on the Wing Machine base, looking straight ahead to read the measurement.

FOOT LENGTH

Purpose: To determine the foot length of the subject.

Equipment: Steel Measurement Tape, Score Card, Pen, etc

Procedure: Foot length was determined by using the steel measurement tape. Participants' foot length was measured. The recorded measurement was documented in centimetres.

ARM LENGTH

Arm length means that if were we to measure that distance from a players shoulder to the tip of their out stretch hand, it would, on average, be around 6.8 feet

COLLECTION OF DATA

The data pertaining to this study were collected from following places:

PLACES	EVENTS
Colvin taluqdars college Lucknow	**50 mtr Freestyle (boys)**
KD Singh Babu Stadium , LUCKNOW	**50 mtr Freestyle (BOYS)**
35 battalion, Lucknow	**50 mtr Freestyle (BOYS)**

Timing of Swimmers above 180 cm of height and below 180 cm of height

Timing Below 180cm(sec)	Timing Above 180cm(sec)
40.11	26.00
36.32	25.00
35.53	27.04
33.00	30.00
28.00	29.59
37.09	28.30
31.49	26.35
31.39	26.49
37.29	28.59
39.35	30.31

43.04	-
28.75	-
42.00	-
45.00	-
43.00	-

The researcher is measuring the arm length at BABU K.D. SINGH STADIUM

The researcher taking the time of swimming players of 50 m free style.

Statistical Techniques used for the analysis of the data:

After collection the data was analysed using the following statistical procedures.

Calculation of mean:

$M = \sum fx/N$

Where,

M= mean

N= Number of scores

∑x= sum of scores

F= frequency

The correlation coefficient is also known as the Pearson correlation coefficient or the Pearson product-moment correlation coefficient. The Pearson correlation coefficient formula is:

r= ∑xy/√(∑x²)×(∑y²)

Where,

X= Data of first group

Y= Data of second group

Mx= Mean of X Group

My= Mean of Y Group

x= X-M

y= Y-M

Anova means analysis of variance, Anova test is a way to find out if survey or experiment results are significant in other words they help you to figure out if you need to reject the null hypothesis or accept the alternate hypothesis, basically you are testing groups to see if there's a difference between them.

Anova - One Way Analyses

F ratio formula,

Step-7: F = MSbg / MSwg

Step- 6: MSbg = SSbg / dfbg

Step- 5: MSwg = SSwg / dfwg

Step- 4: dfbg = k - 1

Step- 3: dfwg = (n1 - 1) + (n2 - 1) + . . . + (nk - 1)

Step -2: SSwg = [(ΣX21 + ΣX22 + . . . + ΣX2k)] - [(ΣX1)2 / n1) + (ΣX2)2 / n2) + . . . + (ΣXk)2 / nk)]

Step -1: SSbg = [(ΣX1)2 / n1) + (ΣX2)2 / n2) + . . . + (ΣXk)2 / nk)] - [(ΣX1 + ΣX2 + . . . + ΣXk)2 / Ntotal]

Where,

N = total number of data

SS= some of square

K= number of groups

MS= mean square

bg= between groups

wg= within groups

df= degree of freedom

RESULT, ANALYSIS AND INTERPRETATION OF THE DATA

Introduction:

The present chapter presents the analysis of data, results and their interpretation. Each section is followed by a brief discussion of the results obtained.

Analysis of data means to make the raw data meaningful or to draw some result form the data after the proper treatment. Thus the analysis of data serves the following main functions-

(i) To make the raw data meaningful

(ii) To obtain significant results

(iii) To draw some inference or make generalization

(iv) To estimate parameters

After analysing the data, the next step is to interpret the results. The process of interpretation is essential on the stating what the results or findings show? What do they mean? What is the answer to the original problem?

Interpretation calls for a critical examination of the result of one's analysis in the light of all the limitations of his data gathering and his subjective attitude which should be avoided. One must be critical of one's own thinking.

In the study, after the data collection the researcher has used the one way ANOVA for the analysis of the data.

Statistical Technique:

Keeping in view the objective of the study and the hypothesis following statistical   techniques was employed for the analysis of the data

ANOVA (One Way ANOVA)

Level of Significance:

To test the hypothesis level of significance was set at 0.05.

Findings:

Findings pertaining to the Selected Anthropometric Measurement such as Height, Body Weight, arm Length, palm Length for the swimming players.

Data of swimming Players ABOVE 180 cm in height Age Group – 15-25 years

S.NO.	Name	Height	Body Weight	Arm Length	Foot Length	Timing
1	Deepak Nishad	185	87.9	161	11.00	26.00
2	Tushar Rai	186	77.7	164	11.00	25.00
3	Manoj Nishad	187	74.09	182	11.20	27.04
4	Akhilesh Singh	184	79.00	180	10.90	30.00
5	Nishit Dixit	183	73.05	179	10.90	29.59
6	Anil Yadav	185	75.06	174	11.00	28.30
7	Rakesh Tripathi	186	89.01	185	10.00	26.35
8	Neeraj Mishra	186	80.00	182	09.00	26.49
9	Ritesh Maheswari	184	72.50	183	10.00	28.59
10	K.P. Singh	183	69.40	180	11.20	30.31

Data of swimming Players BELOW 180 cm in height Age Group – 15-25 years

S.NO.	Name	Height	Body Weight	Arm Length	Foot Length	Timing
1	Anuj Yadav	177	54.9	182	11	40.11
2	Shubham Yadav	174	56.0	178	10.50	36.32
3	Piyush Yadav	155	40.9	149	9.30	35.53
4	Prenat Kushwaha	157	53.4	154	9.40	33.00
5	Vivek Yadav	149	45.6	148	9.00	28.00
6	Raghav Yadav	153	49.7	152	9.10	37.09
7	Raj Bharti	159	54.3	157	8.90	31.49
8	Gaurav Tiwari	153	45.0	151	9.00	31.39
9	Raj Yadav	167	44.8	169	10.00	37.29
10	Krishna Dubey	160	58.9	160	10.00	39.35
11	Armaan Srivastav	174	82.9	172	11.1	43.04
12.	Ayaan Yadav	155	52.8	156	10.20	28.75
13.	Kartik Sahani	166	48.1	170	10.00	42.00
14	Vijam Ram	172	58.70	172	11.00	45.00
15	Akhilesh Yadav	174	51.30	178	10.50	43.00

Chart Title
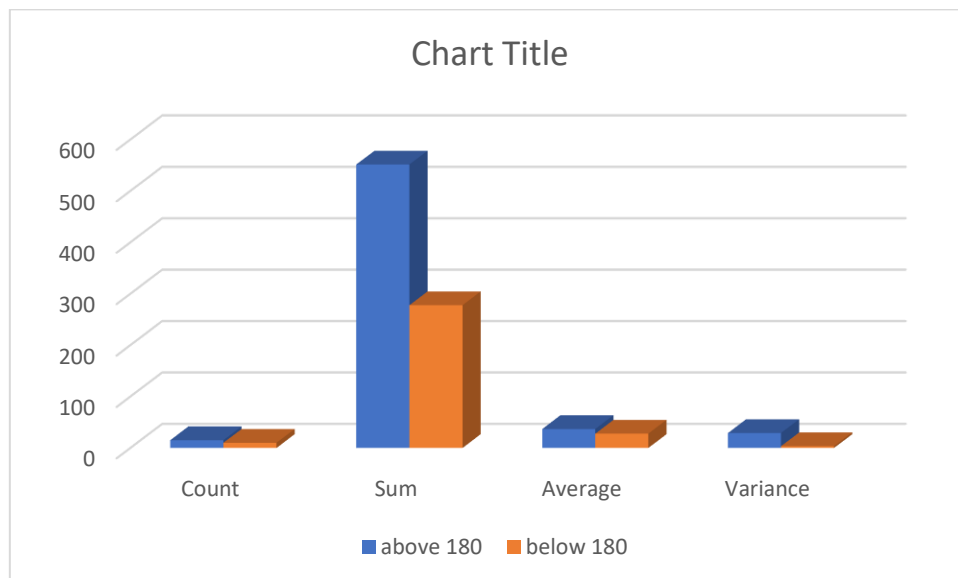
Anova:
Single Factor
SUMMARY

Groups	Count	Sum	Average	Variance
Above 180	15	551.36	36.75733	28.95736
Below 180	10	277.67	27.767	3.40929

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	484.9566	1	484.9566	25.57748	4.05E-05	4.279344
Within Groups	436.0867	23	18.96029			
Total	921.0433	24				

It is evident from the above table that there was significant difference between the Swimmers of 180 above height and Swimmers of 180 below height as the obtain F value 25.57 was more than the required F crit 4.27.

As the obtained F value was found to be significant, the LDS (Least Significant Difference) was applied to determine the significance of difference between the Swimmers of 180 above height and Swimmers of 180 below height data.

The analysis pertaining to L.S.D. (Least Significant Difference), where L.S.D. is 0.77 and the Average difference of Pre-test and Post-test is 3.109.

If the average difference is more than the L.S.D. than the result is significant.

The researcher measuring the arm length

The purpose of the discussion is to present and explain the significance of finding, where it finds that when we compare the Swimming players of Above the 180 cm height and Below 180 cm height, we find that more effective time was of above 180 cm height, as we find that their arm length, foot length and height effects a lot.

Discussion on Hypothesis:

It is evident from the above analysis that there was significant difference between the Swimmers of Above 180 cm 0f height and Below 180 cm of height as the obtain F value 25.57 was more than the required F crit 4.27.

As the obtained F value was found top be significant, the LDS (Least Significant Difference) was applied to determine the significance of difference between the paired taekwondo skill data.

The analysis pertaining to L.S.D. (Least Significant Difference), where L.S.D. is 3.67 and the Average difference of Pre-test and Post-test is 8.99.

If the average difference is more than the L.S.D. than the result is significant.

When we were comparing about the Swimming Above 180 cm of height and Below 180 cm of height, we find the difference, which effect the perfection, the journals regarding swimming helps about the proper things and books help for basic knowledge

Suggestions

This study can be done with any swimming player, the result will be same

Recommendation

The measuring must be conducted properly, which effect the them with positive response. And the result come in the study must be recorded and used for future study.

In the light of the findings of this study the following recommendations can be made to the physical education teachers, and coaches regarding for the swimming on the effects on swimming skills. It may be possible for the coaches and teachers of Physical Education to find out effects of training in swimming.

- Physical Education teachers, coaches use the result of this study as an aid in screening, identification for swimming players.
- In the swimming performance, emphasis must be laid on measuring of 180 cm above and below height of swimming players measurements which have been found significant for the performance.
- The present study may be repeated by selecting the different age group or different area at updated and advance skill on swimming players.
- The present study may be repeated in other games and sports where the performance will develop their skills through training.
- The researcher can recommend this study to be done by taking the result from the same research.

Conclusion

The research finds the swimming players of Above 180 cm of height and below 180 cm of height, the more and best performance will be od above 180 cm of height..

The findings suggest that, the hypothesis is significant. However, further research can also be done to explore more related to the training on slum children.

It may be concluded that the research could be further studied for the betterment of the swimming players.

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