International Journal of Physical Education and Sports Sciences
Vol. 13, Issue No. 08, November-2018, ISSN 2231-3745

A Study on Anthropometric Profile of International and National level Gymnasts in India

Mr. Shubhendu Bauli[1]* Prof. Sanjib Mridha[2]

[1] Gymnastics Coach, Department of Physical Education, University of Kalyani

[2] Professor, Department of Physical Education, University of Kalyani

Abstract – Gymnastics is the oldest sports in Olympic. The term 'gymnastics' had come from the Greek word 'gymnos', meaning is 'to exercise nude', reflecting this meaning, because gymnasts in ancient Greece used to practice and competed completely in naked body . Human body is the most studied object of science (Harris et al., 2002). Scientists from the field of biological sciences use to study the human body in different points of view. Sports scientists consider human body as a machine that gives performance during various physical activities. Therefore, physique plays an important role to understand and analyze sport performance. Physical educationists, now-a-days, consider human body as the manifested from an individual's total health in general and organic health in particular (Lacy & Hastad, 2006). Keeping in view the above facts the researcher intended to work on anthropometric profile of International and National level Indian male gymnast. One hundred and twenty National and International male gymnast from all over India of 17-25 years of age were selected randomly as the subjects of the present study. International group consists of 06 and for national it was 114 subjects. To conduct the present study Age, height weight, Girths, length and breadths measurements were taken. On the basis of collected data the following conclusions were drawn-(1) Age and Height difference were found between International and National level gymnast group. (2) In Arm (Relaxed), Arm (Flexed), Forearm, Wrist, Thigh and ankle girth measurement, the International gymnasts group was better but in Calf and knee girth classification of the gymnasts there were also similar in each variable. (3)In Leg length of International gymnasts groups showed shorter than the National level group. (4) In case of Femur Breadth, the International gymnasts groups was better than other group but in arm length and sitting height as well as in the Humerus breadth measurements the gymnasts of ING and NG group were identical.

Keywords: Anthropometric Parameters, Skinfolds, % of Body Fat, Body Mass Index.

----------♦----------

INTRODUCTION

Gymnastics is the oldest sports in Olympic. The term 'gymnastics' had come from the Greek word '*gymnos*', meaning is 'to exercise nude', reflecting this meaning, because gymnasts in ancient Greece used to practice and competed completely in naked body . The term '*gymnos*' mainly describes for the disciplinary exercises, which includes physical skills such as body control, strength, coordination, dexterity and gracefulness with acrobatic and tumbling skills, all exercise performed in an artistic manner-**(**Wikipedia**)**.

The benefits of gymnastics exercises are enormous as it mainly develops various component of Physical fitness such as strength, flexibility, agility, co-ordination, balance, grace, good posture and ability to respond. Moreover the gymnast's body is continuously changed its direction and pace. In this process, the gymnast gain orientation and the interaction of inner and outer forces which enhance coordination skills and concentration.

Human body is the most studied object of science (Harris et al., 2002). Scientists from the field of biological sciences use to study the human body in different points of view. Sports scientists consider human body as a machine that gives performance during various physical activities. Therefore, physique plays an important role to understand and analyze sport performance. Physical educationists, now-a-days, consider human body as the manifested from an individual's total health in general and organic health in particular (Lacy & Hastad, 2006).

'Anthropometry' means the measurement of man, whether living or dead, and consists primarily in the measurement of the dimension of the body (Montagu, 1960). Anthropometry- the measurement of man- provides scientific methods and observations on the living man and the skeleton. Anthropometry represents the typical and traditional tool of human biology, physical anthropology and Axiology. Recently it has taken a strong bonded relationship with physical education and sports sciences (Sodhi, 1991).

PURPOSE OF THE STUDY

The purpose of the study was to observe-

(1) The present status of International and National level Indian gymnasts in respect to their girths, Length and Breadths.

(2) The comparison between International and National level Indian gymnasts with respect to their girths, Length and Breadths.

METHODS AND MATERIALS

One hundred and twenty National and International male gymnast from all over India of 17-25 years of age were selected randomly as the subjects of the present study. International group consists of 06 and for national it was 114 subjects. To conduct the study the following measurements were taken- Age, Height, and Weight as personal data. For Girth measurements- Arm girth Relaxed, Arm girth flexed, Forearm, Wrist, Chest, Waist, Gluteal, Front Thigh and Calf girth were considered and for Length - Arm length, Leg length, Sitting Height and for Breadth – Humerus Breadth and Femur Breadth were taken. All the measurements were taken followed by standard procedure.

RESULTS AND DISCUSSION

Table-01 contains the personal data on age height and weight of international group (ING) and national group (NG).

Table-01: Personal data of ING and NG groups

Variable	ING			NG			MD	Combined SE	t-ratio
	Mean	SD	SE	Mean	SD	SE			
Age (year)	24.33	0.82	0.33	21.71	2.18	0.20	2.62	0.27	9.70*
Height (cm)	165.83	2.93	1.19	166.24	5.61	0.53	0.41	0.86	0.47 ns
Weight (kg)	58.17	5.49	2.51	61.83	6.14	0.51	3.66	1.51	2.42*

*$t_{0.05}$118=1.98

From the Tabl-01 it is observed that the calculated t-value was 9.70 for Age and 2.42 for Weight which were higher than the critical t-value ($t_{0.05}$118=1.98) and therefore, the difference in Age and Weight were statistically significant between the two groups at 0.05 level (p>0.05). Other hand the t-value 0.47 for height was lower than the critical t-value ($t_{0.05}$118=1.98) and therefore, the difference in height was not statistically significant between the groups.

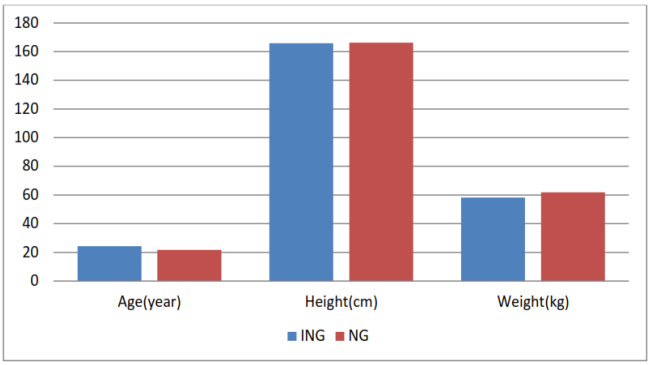

Fig. 01 Graphical representation of mean differences of personal data

Discussion of Personal Data: Age of the ING had greater than the NG. However reverse was observed in weight, where the NG had higher value than the ING. As to the profile of personal data of the two groups the age was 24.33 years ±0.82 years for ING and 21.71 years NG. The height of ING was 165.83cm ±2.93 cm and NG was 166.24cm ±5.61cm. Weight was ING-58.17 Kg. ±5.49 KG and NG -68.83 Kg ±6.14 Kg.

Table-02 contains the girths of international group (ING) and national group (NG).

Table-02: Girth variables of ING and NG groups

Variable	ING			NG			MD	Combined SE	t-ratio
	Mean	SD	SE	Mean	SD	SE			
Arm Relax(cm)	31.67	1.67	0.68	28.14	2.26	0.21	3.53	0.44	8.02*
Arm Flex(cm)	35.92	1.74	0.71	31.99	2.52	0.24	3.93	0.47	8.36*
Forearm(cm)	27.25	1.60	0.65	26.04	1.66	0.16	1.21	0.40	3.03*
Wrist(cm)	17.42	1.02	0.42	16.36	0.75	0.07	1.06	0.48	2.20*
Thigh(cm)	50.58	3.26	1.33	47.78	3.24	0.3	2.80	0.82	3.41*
Calf(cm)	33.00	1.55	0.63	32.84	2.20	0.21	0.16	0.42	0.38 ns
Ankle(cm)	23.00	1.09	0.44	23.88	1.17	0.11	0.88	0.28	3.14*
Knee(cm)	34.17	1.67	0.69	34.05	1.47	0.14	0.12	0.42	0.28 ns

*$t_{0.05}$118=1.98

From the Table-02 it is observed that the calculated t-values were 8.02 for arm girth (relax),8.36 for arm girth (flex), 3.03 for forearm, 2.20 for wrist, 3.41 for thigh, 0.38for calf, 3.14 for ankle girths were higher than the critical t-value ($t_{0.05}$118=1.98) and therefore, the difference in arm girth (relax), Arm girth(Flexed), Forearm, Wrist, Thigh and Ankle girths were statistically significant but the t-value of Calf and Knee girths were 0.38 and 0.28 which were lower than the critical Value t-value ($t_{0.05}$118=1.98) and therefore, the difference in Calf and knee girths were not statistically significant.

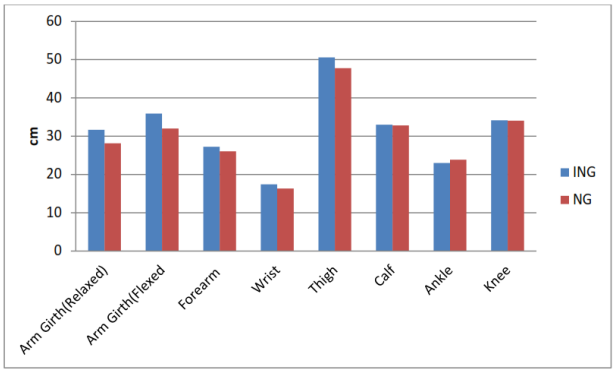

Fig. 02 Graphical representation of mean differences of Girths

Discussion of Girth Measurements:

Among the eight girths the ING was shown to be superior to the NG at six sites namely – arm (relaxed), arm (flexed), fore arm, thigh and ankle. However, the difference was not significant at calf and knee sites but no difference in the remaining measurements.

Table-03 contains the statistics of lengths and breadths of ING and NG.

Table-03: Lengths and Breadths of ING and NG groups

Variable	ING			NG			MD	Combined S.E.	t-ratio
	Mean	SD	SE	Mean	SD	SE			
Arm length (cm)	75.00	2.37	0.97	75.69	2.83	0.27	0.69	0.61	1.13 ^{ns}
Leg length (cm)	87.50	4.23	1.73	92.36	5.37	0.50	5.46	1.12	4.87*
Sitting height (cm)	85.83	1.47	0.60	86.08	3.62	0.34	0.25	0.47	0.53 ^{ns}
Humerus Breadth (cm)	6.66	0.27	0.10	6.54	0.36	0.03	0.06	0.07	0.85 ^{ns}
Femur Breadth(cm)	8.74	±0.54	0.22	8.44	±0.39	0.04	0.30	0.13	2.30*

*$t_{0.05}118=1.98$

From the Table-03 it is observed that the calculated t-value 1.13 for Leg length and 2.30 for Femur Breadth were higher than the critical t-value ($t_{0.05}118=1.98$) and therefore, the difference in Leg length and Femur Breadth were statistically significant.

The calculated t-value 0.61 for Arm length, 0.53 for Sitting height and 2.30 for Humerus Breadth were lower than the critical t-value ($t_{0.05}118=1.98$) and therefore, the difference in Arm length, Sitting height and Humerus Breadth were statistically not significant.

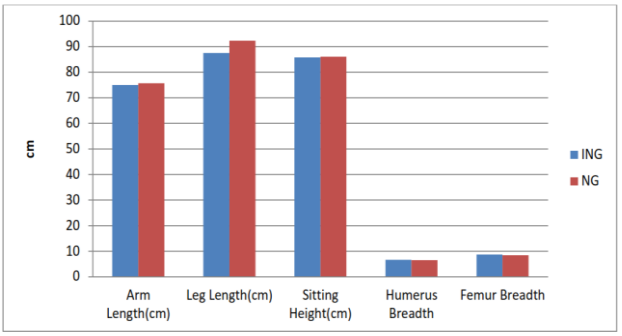

Fig. 03 Graphical representation of mean differences of Length and Breadth

Discussion of Length and Breadths:

Among the three length and two breadths the ING was superior than the NG group in each of the dimensions, namely - leg length in the length segment and bi-epicondyler femur, the remaining measurement were not different.

CONCLUSION

On the basis of the result and discussion of the present study the following conclusions were drawn-

(1) Age and Height difference were found between International and National level gymnast group but there was no difference found in weight category.

(2) In Arm (Relaxed), Arm (Flexed), Forearm, Wrist, Thigh and ankle girth measurements, the International gymnasts group was better but in Calf and knee girth classification of the gymnasts was similar in each variable.

(3) In Leg length of International gymnasts group showed shorter with respect to the National level group.

(4) In case of Femur Breadth, the International gymnasts groups was better than other group but in arm length and sitting height as well as in the Humerus breadth measurements the gymnasts of ING and NG group were identical.

REFERENCES

1. Sodhi, H.S. (1991). Sport Anthropometry: A kinanthropometric approach. Anova publication: Mohali.

2. *en.wikipedia.org/wiki/Anthropometry*, *30.01.2018.*

3. Durnin J. V.G.A and Womersley (1974). Body fat assessed from total body density and its estimation from skinfold thickness:

Measurement on 481 men and women aged from 16 to 72 years. Brit. J. Nutr.,32: pp. 77-97.

4. Nath, S. (1993). Anthropometry: The Measurement of body size, shape and Forms. Friends Publication: Delhi.

5. Harris, N., Turner, J. and Astom C. (2002). Visual Encyclopedia. Orphens Book Ltd.: New Delhi.

6. https://tskvspartacus.nl/tools/7-point-fat-percentage-calculator.php….,29.01.2018.

Corresponding Author

Mr. Shubhendu Bauli*

Gymnastics Coach, Department of Physical Education, University of Kalyani

shubhendu.bauli2012@gmail.com