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To identify the specific exercise which have maximum effect on the Lung Function Test

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Abstract:

Background&Method: The present study was conducted on one hundred Fourteen males divided into four groups at Index Medical College Hospital & Research Centre, Indore, with an aim to identify the specific exercise which have maximum effect on the Lung Function Test. Purposive sampling that is those subjects pursuing similar physical activity for a minimal period of two years in the age group of eighteen to thirty years. The idea behind choosing these physical activities was that in each group the types of movement performed were variable and body posture is also quite different.

Result: On comparing group A from group B the mean difference is 0.09 and significance is 0.85, which is statistically non significant. On comparing group A from group C the mean difference is 0.36 and significance is 0.02, which is statistically significant On comparing group A from group D the mean difference is 0.24 and significance is 0.20, which is statistically non significant. On comparing group B from group C the mean difference is 0.46 and significance is 0.00, which is statistically significant.
On comparing group B from group D the mean difference is 0.14 and significance is 0.61, which is statistically non significant. On comparing group C from group D the mean difference is 0.60 and significance is 0.00, which is statistically significant.
On comparing group A from group B the mean difference is 0.10 and significance is 0.76, which is statistically non significant. On comparing group A from group C the mean difference is 0.34 and significance is 0.00, which is statistically significant. On comparing group A from group D the mean difference is 0.00 and significance is 0.8, which is statistically non significant. On comparing group B from group C the mean difference is 0.44 and significance is 0.00, which is statistically significant. On comparing group B from group D the mean difference is 0.09 and significance is 0.8, which is statistically non significant. On comparing group C from group D the mean difference is 0.35 and significance is 0.05, which is statistically significant.

Conclusion: Regular physical activity is one of the most emphasized remedies for prevention and management of non-communicable diseases. Physical activity has beneficial effect on almost every system of the body but the information regarding the underlying mechanism causing physiological changes due to physical activity is less dispersed, therefore it is important to study the effect of various physical activities on physiological functions.Exercising in akhada is a popular form of exercise undertaken by a lot of Indian males. Facilities of akhada exist even in small towns and villages. However, there is paucity of scientific data as hardly any studies have been performed on these subjects.

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Keywords:exercise, lung function test,

Study Designed: Observational Study.

1. INTRODUCTION

The evolution of fitness can be attributed to man's need for survival and can be traced back to the beginning of mankind. Primitive men (pre-10,000 B.C.) need to be fit to be able to go through their journey to hunt for food and water[1]. Being nomads and hunters, the activities of this people required a lot of physical activity and fitness (their celebration events included trips of six to twenty miles to neighboring tribes to visit friends and family). With the invention of the plow and other agricultural development (10,000-8,000 B.C.) comes the beginning of a less active lifestyle. Neolithic men started using plow and animals to do the difficult tasks, thus decreasing the amount of physical activity[2].

In the ancient civilization (2500-250 B.C.), people started relating physical activity with physical well-being. In China, through the philosophical teachings of Confucius, they associated certain diseases with physical inactivity,this lead through the development of Cong Fu gymnastics[3].

During the same period, Yoga was developed in India. Yoga is an exercise program that conforms to Hinduism and Buddhism beliefs and puts emphasis on spirituality.In 4000-250 B.C., there was a strong demand for fitness for military purposes. People during that era linked fitness with one's performance in the military[4]. Activities like hunting, marching, riding and javelin throwing have been developed to meet the need for physically fit soldiers. The Persian Empire and Spartans are good examples of empires that make use of fitness for this purpose. Spartans required fitness for men to be good soldiers and for women to bear children who are fit to serve the state. Because of this, Sparta actually became one of the most physically fit societies in history[5].

2. MATERIAL & METHOD

The present study was conducted on one hundred Fourteen males divided into four groups at Index Medical College Hospital & Research Centre, Indore, M.P. from November 2020 to April 2021.

- Group 1 Comprised of twenty-seven young adults engaged in exercises in the akhada
- Group 2 Comprised of thirty young adults engaged in exercises at the Gymnasium.
- Group 3 Comprised of twenty-seven young adults engaged in swimming.
- Group 4 Comprised of thirty healthy young adults not routinely engaged in any specific exercise.

Purposive sampling that is those subjects pursuing similar physical activity for a minimal period of two years in the age group of eighteen to thirty years.

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The idea behind choosing these physical activities was that in each group the types of movement performed were variable and body posture is also quite different.

Medical History: These included

1. Any medical complain
2. History of any medical illness of long duration specially of respiratory illness
3. History of surgical procedure performed

Family History: These included

1. History of medical illness like hypertension, diabetes, respiratory disease, cardiac disease, or any other illness.
2. History of surgical procedure performed

3. RESULTS

Table No. 1: Comparison of Four Groups in Age Height and BSA

	Age (In years)		**Height (In cms)**		**BSA (In m^2)**	
Group	**Mean**	**S.D**	**Mean**	**S.D**	**Mean**	**S.D**
A	20.77	2. 70	172.56	7.19	11.83	0.14
B	21.5	3.39	172.47	5.78	1.79	0.10
C	21.29	3.33	176.59	5.69	1.80	0.12
D	21.4	3.20	169.9	6.09	1.68	0.13

Table shows persons engaged in Akhada (Group A) have, mean age of 20.77 ±2.7 years, mean height is 172.55±7.19 cms and mean BSA is 1.83±0.14m^2.
Persons engaged in gymnasium (Group B) have, mean age of 21.5±3.39 years, mean height is 172.46±5.78 cms, and BSA is 1.79±0.103m^2
Persons engaged in swimming (Group C) have, mean age 21.29±3.33 years, mean height is 176.59±5.69 cms, mean weight is 65.62±8.62 kg, mean BSA is 1.80±0.12 m^2 and their mean calorie intake is 2238.62±557.14
In control (group D), mean age, is 21.4 ±3.20 years, mean height is 169.9±6.09 cms, mean weight is 59.73±8.73 kg, mean BSA is 1.68±0.135 m^2 and their mean calorie intake is 2217.33±467.63.

Table No. 2: Comparison of variables of Spirometry between different groups

	Inspiratory Vital Capacity		**Inspiratory Reserve Volume**		**Expiratory Reserve volume**	
	Mean Diff	**Sig**	**Mean Diff**	**Sig**	**Mean Diff**	**Sig**
A-B	0.16	0.48	0.09	0.85	0.10	0.76
A-C	0.61*	0	0.36*	0.02	0.34*	0.00
A-D	0.40*	0.005	0.24	0.20	0.00	0.8
B-C	0.78*	0	0.461*	0.00	0.44*	0
B-D	0.23	0.18	0.14	0.61	0.09	0.8
C-D	1.01*	0	0.60*	0	0.35*	0.00

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* The mean difference is significant at the .05 levels

Inspiratory Vital Capacity

On comparing group A from group B the mean difference is 0.16 and significance is 0.48, which is statistically non significant.On comparing Group A from group C The mean difference is 0.61 and significance is 0, which is statistically significant.On comparing group A from group D the mean difference is 0.40 and significance is 0.00, which is statistically significantOn comparing group B from group C the mean difference is 0.78 and significance is 0.00, which is statistically significant.On comparing group B from group D the mean difference is 0.23 and significance is 0.18, which is statistically non significant.On comparing group C from group D the mean difference is 1.01 and significance is 0.00, which is statistically significant.

Inspiratory Reserve Volume

On comparing group A from group B the mean difference is 0.09 and significance is 0.85, which is statistically non significant.On comparing group A from group C the mean difference is 0.36 and significance is 0.02, which is statistically significantOn comparing group A from group D the mean difference is 0.24 and significance is 0.20, which is statistically non significant.On comparing group B from group C the mean difference is 0.46 and significance is 0.00, which is statistically significant.

On comparing group B from group D the mean difference is 0.14 and significance is 0.61, which is statistically non significant.On comparing group C from group D the mean difference is 0.60 and significance is 0.00, which is statistically significant.

Expiratory Reserve volume

On comparing group A from group B the mean difference is 0.10 and significance is 0.76, which is statistically non significant.On comparing group A from group C the mean difference is 0.34 and significance is 0.00, which is statistically significant.On comparing group A from group D the mean difference is 0.00 and significance is 0.8, which is statistically non significant. On comparing group B from group C the mean difference is 0.44 and significance is 0.00, which is statistically significant.On comparing group B from group D the mean difference is 0.09 and significance is 0.8, which is statistically non significant.On comparing group C from group D the mean difference is 0.35 and significance is 0.05, which is statistically significant.

4. DISCUSSION

Physical activity is of various types. To compare them, in the present study we have taken subjects that do not comprises homogenous group[6]. They include AkhadaPahalwan, who often heavily built, have great muscle strength, well developed shoulder girdles and have some aerobics capacities, Gymnasts who have muscle strength and anaerobic capacity, and swimmers who usually have thick layers of subcutaneous fat with aerobics capacities[7]. All of them are compared with control persons who are not engaged in regular physical activities.

We have taken group of AkhadaPahalwan, who has not been studied as yet. Though AkhadaPahalwan considered as synonymous to wrestler in the west but on practical basis they are different from the “wrestlers” They

1. Believe in wrestling in ‘Red clay” Ring
2. Have traditional coach called ‘Ustad’
3. Perform traditional exercises that contain:

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- Isometric exercises
- Isotonic exercises

Isometric exercises: - the length of muscle does not change but lot of power is generated,. This is performed in practicing wrestling in the ring with a fellow pahalwan.

Isotonic exercises: -when the muscles are actively contracting with shortening of length. Which are required to be stretched to bring down to original length to release e.g. most of the exercises including traditional Indian instruments and techniques are used to perform most common are oil massage, push-up and sit-up, digging the clay in the ring[8]. Instruments like wooden "Mudgar"(or Indian style dumbbell), which are broader at the distant end and handle at the other end, rope climbing and Malkhamb is a wooden pillar about 8 feet in length tapering towards the top and oil is rubbed over it. A pahalwan using co-ordination of hands and feet, climbs over it reaches its top and balances over its tip that gives him lot of strength and co-ordination. Pahalwan also uses single bar, double bar for different exercises[9].

Their exercises can be classified as Aerobic and Anaerobic exercises

Aerobic Exercise consists of wrestling, oil massage, climbing on rope etc.

Anaerobic exercises include rest of the exercises like moving around mudgar, use of dumbbell, weighting lifting etc. Our second group consists of persons involve in performing exercise in the Gymnasium. They perform the following exercises.

- Warm up exercises
- Sit ups
- Push ups
- Rock and roll movement of the abdomen
- Lying on the back raising the legs straight and touch the floor on the back of the head
- A combination of short sprints, backward and side to side running.
- Body conditioning- Weight training, gradual, giving importance to particular muscle group. Weight training is not direct lifting of weights; it is indirect through the media of pulling etc.

5. CONCLUSION

A total one hundred and fourteen male regularly performing various physical activities were included in the study. Out of these twenty-seven were practicing in Akhada, thirty were going to gymnasium on regular basis and twenty-seven were swimmers and thirty persons formed the control group (they were not indulging in any kind of regular physical activity). Regular physical activity is one of the most emphasized remedies for prevention and management of non-communicable diseases. Physical activity has beneficial effect on almost every system of the body but the information regarding the underlying mechanism causing physiological changes due to physical activity is less dispersed, therefore it is important to study the effect of various physical activities on physiological functions.

Exercising in akhada is a popular form of exercise undertaken by a lot of Indian males. Facilities of akhada exist even in small towns and villages. However, there is paucity of scientific data as hardly any studies have been performed on these subjects.

6. REFERENCES

[1] Bhargava R.P., Mishra S.M. and Gupta N.K. Ventilatory Tests and Lung volume Studies in Madhya Pradesh – Physiological Norms. Indian Journal of Physiology and Pharmacology 1973 July;17(3):267-272.

ISSN:0975-3583,0976-2833 VOL12,ISSUE05,2021

[2] Bhattacharya D.K. Vital Capacity of the Jat males of Punjab: Modification of formulae existing for its computation. Indian Journal of Medical research 1963;51(2):361-365.
[3] De Arun Kumar. Peak Expiratory Flow Rate in Adolescents male swimmers of all India rural swimmers meets. Indian Journal of Physiology and Pharmacology 1992 ; 36 (2) : 118-120.
[4] Bisen V.S, Gurshani C.A and Ranade V.G. Test of physical fitness and body parameters. Indian Journal of Physiology and Pharmacology 1972 April;16(2)163-165
[5] Gupta M, Singh S, Singh K.P, Yadav A, Tandon OP. Respiratory Function Status in Obstructive Lung Disease Patients Before and After Short Term Breathing Exercises. Indian Journal of Physiology and Pharmacology 2005; 49:5.
[6] 6. Borelli G.A. (1679), cited by John F. Perkins Jr. Historical development of Respiratory Physiology. Handbook of Physiology 1964; 3(1):47.
[7] 7. Jurin J (1700) cited by John F. Perkins Jr. Historical development of Respiratory Physiology. Handbook of Physiology 1964;3(1):
[8] 8. Kamat S.R., Tyagi N.K. and Rashid S.S.A. Lung Function in Indian adult subjects. Lung India 1982 Aug;1(1):11-21.
[9] 9. Kamat S.R. Godkhindi K.D. Correlation of health morbidity to air pollutant levels in Bombay city: results of prospective 3 year survey at one year. Journal of postgraduate medicine 1980;26:45-62.