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Influence of Anthropometric Parameters on Aerobic Capacity among Dancers

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Abstract:-

- ***Background:***

Dance is the body movement in a rhythmic way, usually to music and within a given space, for the purpose of expressing an emotion, releasing energy, or simply taking delight in the movement within the body's capable. The movements of dance performed in everyday living and it is not directly related to work, travel or survival.

- ***Objective*:**

To find out the influence of anthropometric parameters on aerobic capacity among dancers.

- ***Study Design:***

Comparative study design, observational type.

- ***Procedure:***

100 subjects were conveniently selected based on Inclusion and Exclusion criteria and divided into 2 groups. Group A (Hip-Hop dancers) and Group B (Indian classical dancers). Each group consists of 50 subjects.

- ***Results:***

The mean value of Body mass index and VO_2max, (p=0.320) in group 1(Hip-Hop dancers) and (p= 0.940) in group 2(Indian classical dancers). The mean value of Waist-hip ratio and VO_2max, (p=0.030) in group 1(Hip-Hop dancer) and (p<=0.170) in group 2(Indian classical dancers).

- ***Conclusion:***

The study was concluded that there is no significant changesin the anthropometric parameters on aerobic capacity among dancers.

Keywords:- *Body Mass Index, Waist-Hip Ratio, Vo_2max, Queens College Step Test, Dancers.*

I. INTRODUCTION

Dance is the good form of exercise, the movement of the body in a rhythmic way to music and within a given space, for the purpose of expressing an idea or emotion, releasing energy, or simply taking delight in the movement itself which the body is capable. Dance movements are not directly related to work, travel or survival, unlike the movements performed in everyday living.There are different populars of dance categories and varieties of dances are Indian classical dance, Folk style, Ballroom dance, Moon walk, Salsa, Hip-Hop dance, Belly dance, Contemporary dance, Ballet dance, disco dance Etc...Indian classical dance are also called Shastriya Nritya. The number of recognized classical dances depending on the source and scholar- Bharatanatyam, kathak, manipuri, kathakali, kuchipudi, sattriya, odissi and mohiniyattam. These dances have been regional and includes music and recitation in Sanskrit, and they represent a unity of ideas in a diversity of styles, and expression.Indian classical dance is a active and non-competitive form of exercise that provides potential positive effects for physically health as well as mentally and emotional well being. It helps in establishment of connection between mind and body, improves balance.Bharatnatyam consist of three aspects Nritta, Natya, Nritya. Nritta commands movement of each and every part of the body. Natya and Nritya are helpful in stress reducing and increase in the functions of reticular activating sytem and limbic systems by releasing the neurotransmitters.Hip Hop Dance is a style of dance which deeply historical, social and cultural. Hip Hop dance also associated with mock-battle forms (uprock), and floor movements like spins, freezes, and more (downrock). Hip Hop dance is the bone break styles which includes a different styleslikebreaking, locking, popping.Hip Hop dance is used as cardiac exercise that gets heart rating and heart pumping up. It also used to losing the weight, lowering the blood pressure, reducing stress and gives more energy.

Aerobic capacity is the maximum amount of physiological work that an individual can do, and it is measuring by the oxygen consumption of individual. It is valued by a combination of cardiovascular conditioning and the aging, and also the efficient of extraction of oxygen from the tissue. The maximum rate of oxygen at which an individual can taking up from the air is also called as maximal oxygen consumption (VO_2 Max).The factors affecting the strength and heart size, concentration of blood, densities of mitochondria and capillaries in muscles,

and aerobic enzyme's activity; an aerobic capacity is increased by proper training.Vo_2Max is the maximal amount of oxygen that an individual can use to produce the energy required for any physical activities. The cardiovascular endurance is important for dancers, an aerobic capacity exercises strengthen the cardiovascular system and its benefit.

The benefits of aerobic capacity for dancers

- To improves the posture alignment and health.
- It enhances the stamina which increase performance ability.
- It increases the oxygen supply to muscles efficiently and it mproves anaerobic ability.
- It reduces the risk of fatigue and improves the concentration and reducing the stress levels.
- It reduces the risk of injury and improves the immune system.

Anthropometric Measurements are used to assess the size, shape and composition of the human body. Common method used to measurement such as Body Mass Index (BMI), Waist-to-Hip ratio. The Body Mass Index is expressed in units of kg/m2, defined as the body weight divided by the square of the body height. Waist-to-Hip ratio is the ratio of the waist circumference and hip.

A. Aim of the Study

To find out the influence of anthropometric parameters on aerobic capacity among dancers.

B. Need for the Study

Dancing is the good form of exercise. Nowadays, lots of different dancing styles evolved other than our classical dance. Lots of studies were done in other style of dancing but still only a very few literature exist in classical dances further only few studies report evaluation of aerobic capacity among dancers. Usually influence of age is analyzed on aerobic capacity. To our knowledge no study exist that chart the influence of anthropometric parameters on aerobic capacity among dancers. So this study was to find out the influence of anthropometric parameters on aerobic capacity among dancers and to train them appropriately for better performance.

II. METHODOLOGY

STUDY DESIGN : Comparative study
STUDY TYPE : Observational type
SAMPLE METHOD: Convenient sampling
SAMPLE SIZE : 100 Subjects
(50 Hip-Hop dancers)
(50 Indian classical dancers)
STUDY SETTING : Kankrish dance company, Ayanavaram and
Hip-Hop dance studio, Aavadi.

- *Inclusion Criteria*

- Both Male and Female dancers. Age between 17 to 30 years.
- Dance experience: Minimum regular 6months practice (one session of one to two hours duration and minimum 3days in a week).

- *Exclusion Criteria*

- Cardiopulmonary diseases.
- Recent musculoskeletal injuries.

- *Materials Used*

- Inches/41.3cm step Metronome
- Measuring tape Weight machine
- Stadiometer

III. PROCEDURE

Subjects who fulfilled inclusion and exclusion criteria ware included in the study and informed consent was taken from all of the subjects. According to the inclusion criteria 100 subjects were conveniently selected and divided into two groups. Each group consists of 50 subjects, First group Hip-Hop dancers and Second group Indian classical dancers. Demographic data was collected, Body Mass Index, Waist-Hip Ratio, and Vo_2Maxwas measured. To measure the Hip circumference, Waist circumference, waist hip ratio for the subject, Waist-hip ratio is measured by the ratio of Waist circumference divided by Hip circumference. To measure the waist circumference, locate the upper hip bone and the top of the right iliac crest. In abdomen at the level of iliac crest tape is place in the horizontal plane; ensure that the tape should not snug and parallel to the floor before reading. To measure the height, weight, body Mass Index for the subject, Height of the subjects was measured by standiometer. To measure the height, the subjects remove shoes and hair ornaments to for proper assessment. The subject is made to stand on the footplate with back against standiometer rule with legs together and straight, arm the sides, and shoulders are relaxed. The subject body contact with the standiometer and body is in a straight line is assured. Weight of the subject was measured by weight machine. To measure the aerobic capacity for the subject, the aerobic capacity was assessed by using queens' college step test. For the female subjects the rate of 22 steps per minute and for the male subjects the rate of 24 steps per minute in the 41.3cm step and Step up and down on the platform should be done.

The subjects are to step using a four steps cadence, "UP-UP-DOWN-DOWN" for 3minutes, on the completion of test, the subject's stops immediately and the heart beats are counted for recovery of 15seconds from 5-20 seconds. Multiplying 15 seconds reading by 4 which give the beats per minute value is used in calculation.

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IV. DATA ANALYSIS

The data obtained from the dancers were tabulated and entered in MS-Excel spread sheet.

The data was analyzed using descriptive statistics and ANOVA with IBM SPSS statistics version 20.

	FREQUENCY	PERCENT
BELOW NORMAL <18.5	1	2.0
NORMAL WEIGHT :18.5 TO 24.9	42	84.0
ABOVE NORMAL : 25 TO 29.9	7	14.0
TOTAL	50	100.0

Table 1:- BMI Classification of Indian Classical Dancers

	FREQUENCY	PERCENT
NORMAL WEIGHT :18.5 TO 24.9	21	42.0
ABOVE NORMAL : 25 TO 29.9	29	58.0
TOTAL	50	100.0

Table 2:- BMI Classification of Hip-Hop Dancers

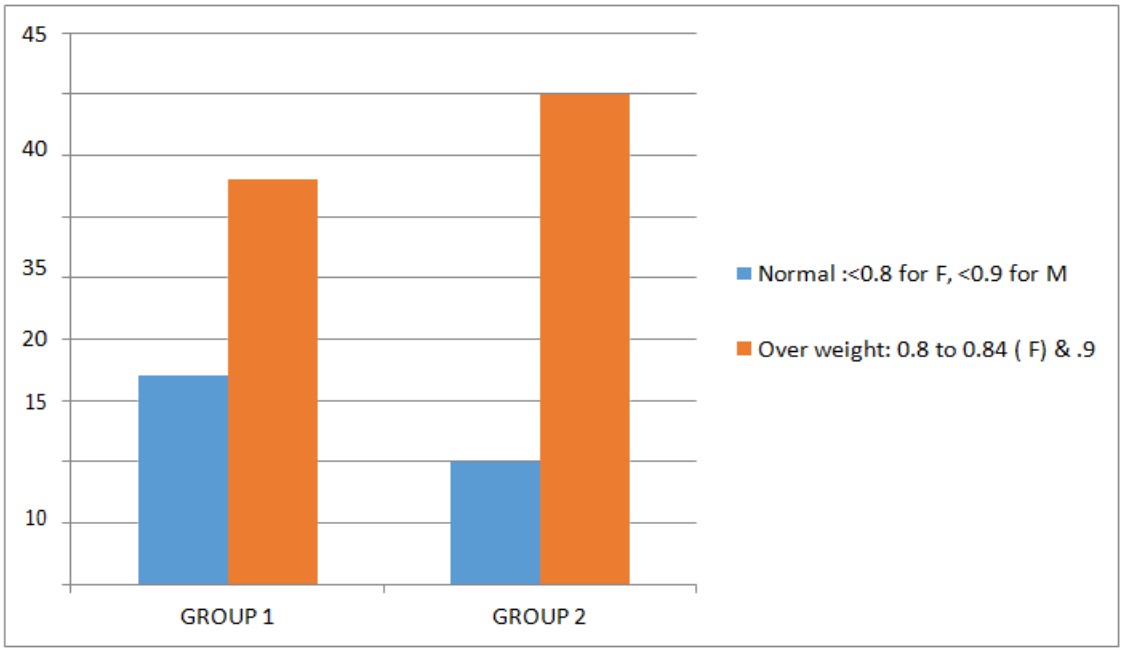

Fig 1

	FREQUENCY	PERCENT
Normal :<0.8 for F, <0.9 for M	17	34.0
Over weight: 0.8 to 0.84 (F) & .9 to .99 (M)	33	66.0
Total	50	100.0

Table 3:- WHR Classification of Indian Classical Dancers

	FREQUENCY	PERCENT
Normal :<0.8 for F, <0.9 for M	10	20.0
Over weight: 0.8 to 0.84 (F) & .9 to .99 (M)	40	80.0
Total	50	100.0

Table 4:- WHR Classification of Hip-Hop Dancers

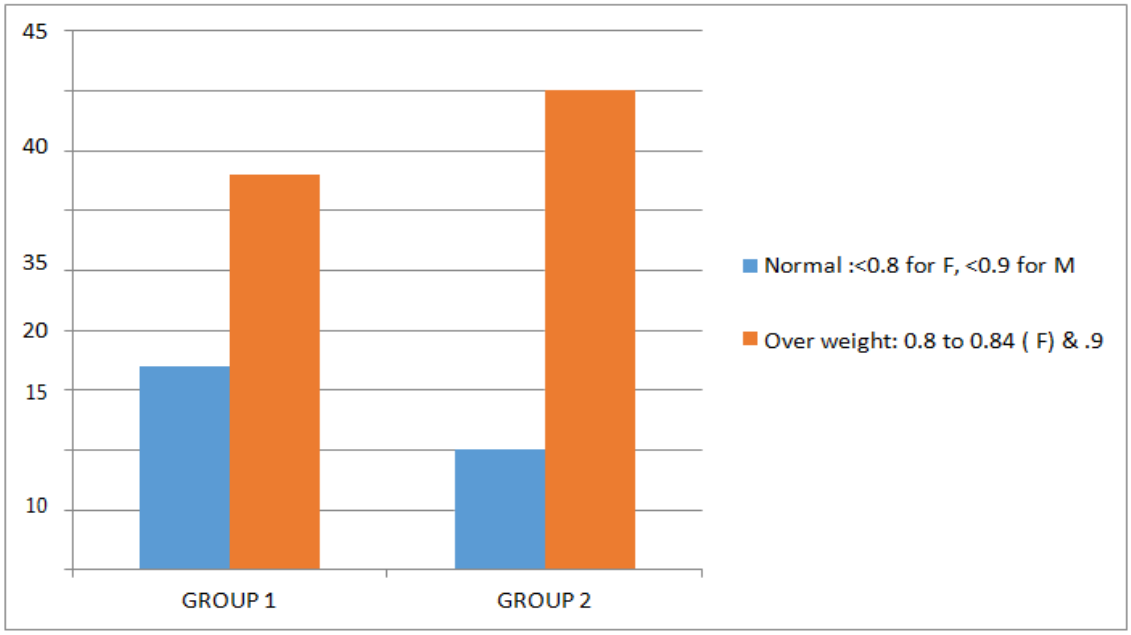

Fig 2

VARIABLES	N VALUE	P VALUE
BODY MASS INDEX	50	.317
VO_2 MAX	50	.317

Table 5:- Correlation of Body Mass Index and Vo_2max Values of Hip-Hop Dancers

P > 0.05

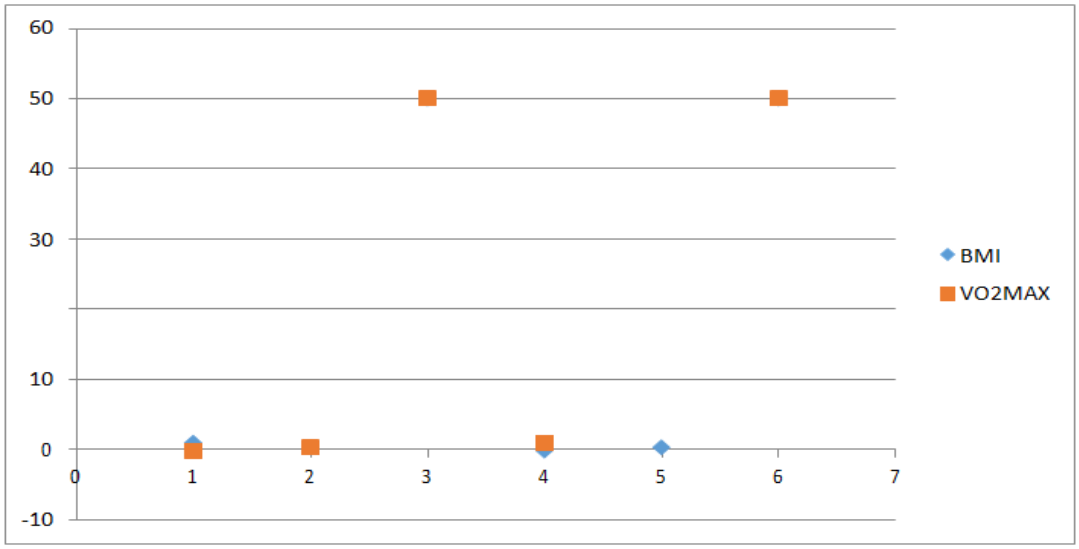

Fig 3

VARIABLES	N VALUE	P VALUE
BODY MASS INDEX	50	.936
VO_2 MAX	50	.936

Table 6:- Correlation of Body Mass Index and Vo_2max Values of Indian Classical Dancers

P > 0.05

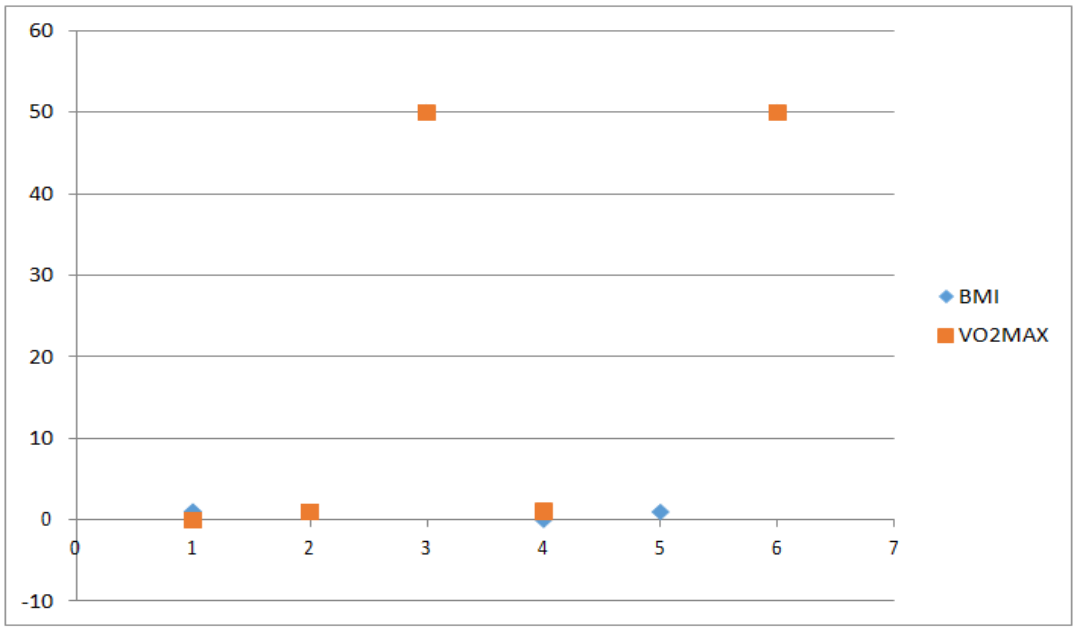

Fig 4

VARIABLES	N VALUE	P VALUE
WAIST- HIP RATIO	50	.678
VO_2 MAX	50	.678

Table 7:- Correlation of Waist-Hio Ratio and Vo_2max Values of Hip-Hop Dancers

P > 0.05

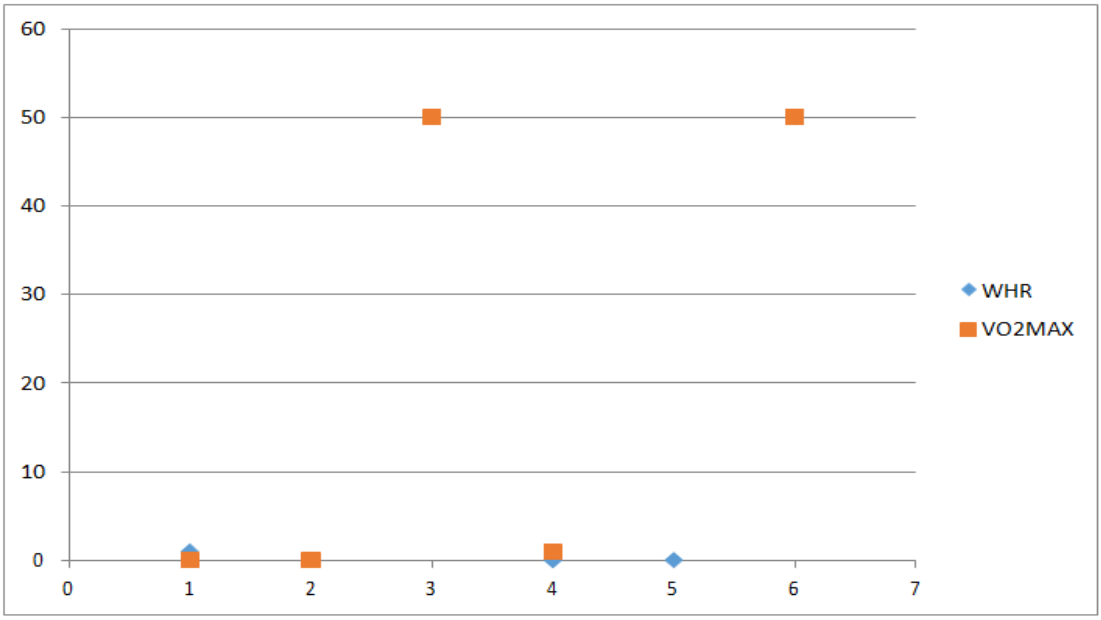

Fig 5

VARIABLES	N VALUE	P VALUE
WAIST- HIP RATIO	50	.307
VO_2 MAX	50	.307

Table 8:- Correlation of Waist-Hio Ratio and Vo_2max Values of Indian Classical Dancers

P > 0.05

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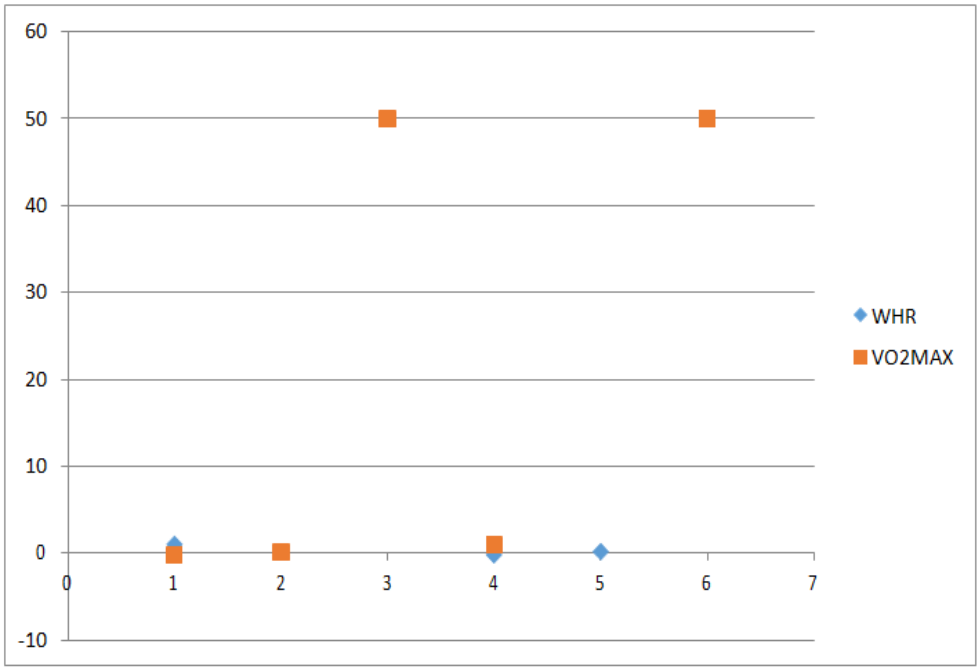

Fig 6

V. RESULTS

- According to **Table 1, 2** show the values of body mass index classification of Indian classical dancers and Hip-Hop dancers.
- According to **Table 3, 4** show the values of waist-hip ratio classification of Indian classical dancers and Hip-Hop dancers.
- According to **Table 5,** there is no correlation between the Body Mass Index and VO_2max, (p=0.320) in Hip-Hop dancers.
- According to **Table 6,** there is no correlation between the Body Mass Index and VO_2max, (p= 0.940) in Indian classical dancers.
- According to **Table 7,** there is no correlation between the Waist-hip ratio and VO_2max, (p=0.030) in Hip-Hop dancers.
- According to **Table 8,** there is no correlation between the Waist-hip ratio and VO_2max, (p=0.170) in Indian classical dancers.

VI. DISCUSSION

The study was done to compare the significance of anthropometric parameters on aerobic capacity among dancers. This study was attempted to compare the body mass index and waist-hip ratio on aerobic capacity in Hip-Hop dancers and Indian classical dancers.According to the results, there is no significant difference in body mass index on aerobic capacity (VO_2max) of the indian classical dancers (p=0.320) and hip-hop dancers (p=0.940).According to the results, there is no significant difference in waist-hip ratio on aerobic capacity (VO_2max) of the indian classical dancers (p=0.030) and hip-hop dancers (p=0.170).The effect of any aerobic training is dependent on exercise of sufficient intensity, duration and frequency[5].Indian classical dancers and Hip-Hop dancers includes high impact physical activity sustained for longer duration of time. This both dances includesdifferent types of steps in different posture alignment and with varieties of expressions and difficult movements and which involves in each and every part of the body of the dancer[6].Less effects of aerobic activities when performed on regular basis which leads to there is no influence of anthropometric parameters on aerobic capacity. No changes occurs in the anthropometric parameters on aerobic capacity because of lack of aerobic activities among dancers. The statistical analysis of both the Indian classical dancer and hip-hop dancer showed a statistically no significance of body mass index and waist-hip ratio on aerobic capacity.Findings of different studies have shown that significant improvement of VO_2max, whereas in some studies did not prove improvement in correlation of anthropometric parameters on aerobic capacity statistically.Results of Ujwal L Yeole, RuchiTople et al[1] in their study of VO_2max improved with in advancement of training in aerobic capacity.

Other studies, Gaitwad et al[6], the most commonly Indian classical dancers was more falling into good categories and aerobic capacities under “good” and “average” percentage in Indian classical dancers.Hovsepian et al[11]in their study of training effects of aerobic on pulmonary function test and physical fitness parameters concluded that significant improvement in VO_2max.Therefore, the results of this study has shown that no significant changes of anthropometric parameters on aerobic capacity among dancers.

VII. CONCLUSION

In this study there are no significant changes in the anthropometric parameters on aerobic capacity among dancers.

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LIMITATIONS AND RECOMMENDATIONS

➢ *Limitations*

- Small sample size.
- Non uniformity on male and female ratio in groups. No correlation has been done between the two groups.

➢ *Recommendations*

- Large sample size.
- Further studies can be done in different types of dancers.
- Further study can be done to analyze the effect of aerobic capacity using aerobic training.
- Randomized control trial can be done comparing pre and post training VO2max in both the groups.

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