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To Compare The Effect of Specific Yoga and Aerobic Exercise Program on Vital Parameters in Young Adult Females

Bindi Desai¹, Didhiti Desai²

¹Assistant Professor, Bhartimaiya College of Optometry and Physiotherapy, Vesu Road, Surat- 395007, Gujarat, India; ²Lecturer, PG guide, Parul Institute of Physiotherapy, Parul University, Vadodara – 391760, Gujarat, India.

ABSTRACT

Background & Purpose: Aerobics is an effective physical exercise which is often done to music. Yoga is practiced in India and all over world for over thousands of years. Due to its increased awareness in health and natural remedies, yogic techniques (including “asanas” and “pranayama”) are gaining importance and receiving worldwide acceptance. Pranayama, meaning ‘breath control’, is an ancient technique involving slow and rhythmic breathing. Asana means a steady and pleasant posture of the body.

Intervention and Method: The subjects selected randomly will be allocated into two groups. **Group-A** (Yoga Group) and **Group-B** (Aerobic Group) consisting 50 participants in each group according to the availability. Treatment duration: 3 sessions per week for 6 weeks, follow up after 3 weeks. Initial evaluation of participants vital parameters like BP, HR, RR & Temperature will be done prior and after intervention of each group. Group A: Yoga group -Total duration: 45 minute 3 asana include:- Padmasana, Nadi-shodana, Sukhasana, Kpalbhati, Vajrasana, Ujjayi Group B: Aerobic exercises:- Intensity: moderate exercise intensity 1st week and 2nd week: Warm up for 5 minutes Aerobic Exercise-jogging for 5 minutes Walking & aerobics dance for 30 minutes Cool down phase for 5 minutes.

Results: For within group comparison paired t test was used and between group comparison unpaired t test was used. Results presented as mean \pm sd. Yoga shows significant improvement in heart rate, respiratory rate, systolic blood pressure better than aerobics. While diastolic blood pressure and temperature shows statistically equal improvement.

Conclusion: In this study, both groups showed clinical improvement in all Vital Parameters but Specific Yoga program group was statically more significant in vitals like Heart rate, respiratory rate, systolic blood pressure when compared to Aerobics program.

Key Words: Yoga, Aerobics, Heart rate, Respiratory rate, Systolic blood pressure, Diastolic blood pressure, Temperature

INTRODUCTION

The American College of Sports Medicine (ACSM) defines aerobic exercise as “any activity that uses large muscle groups, can be maintained continuously, and is rhythmic in nature.” It is a type of exercise that overloads the heart and lungs and causes them to work harder than at rest⁽¹⁾ and the example are walking, jogging, running, skipping, dancing, swimming, bicycling etc. There are many evidences confirming that the changes, which occur due to the regular physical work, not only increase the functional capacity of organism, but also decrease the risk of various diseases^(2,3).

In order to promote and maintain health, the American College of Sports Medicine (ACSM) recommends a minimum

of 30 minutes of moderate intensity aerobic physical activity five days a week or a minimum of 20 minutes of vigorous intensity aerobic physical activity three days a week⁽⁷⁾. The most recent recommendation from the American College of Sports Medicine (ACSM) & American Heart Association (AHA) suggests promoting and maintaining health. Adult aged 18-65 years need moderate intensity exercise 30 minutes a day 5 days a week⁽⁸⁾.

Physical inactivity and poor physical fitness are associated with several health problems, such as cardiovascular diseases, metabolic disorders (e.g. overweight, obesity, diabetes), musculoskeletal disorders, pulmonary diseases, cancer, psychological problems etc. and so on.⁽¹⁵⁾

Corresponding Author:

Bindi Desai¹, Assistant Professor, Bhartimaiya College of Optometry and Physiotherapy, Vesu Road, Surat- 395007, Gujarat, India.
Email: bindidesai79@gmail.com

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Since 1968 women lifestyle has changed in many ways. Many more women now work outside the homes. A female has to go through different psycho-physiological changes resulting in hormonal issues.⁽¹⁶⁾ All this type of stress causes an imbalance of parasympathetic and sympathetic nervous system due to disturbances of homeostatic mechanisms in the body.⁽¹⁴⁾ Here comes the role of aerobic dance training which not only improves the physical but mental stress as well as establishing equilibrium between sympathetic and parasympathetic components

The Global Burden of Disease study estimates that 52% of CVD deaths occur below the age of 70 years in India. The contributing factors for the growing burden of CVDs are increasing prevalence of cardiovascular risk factors especially hypertension, dyslipidemia, diabetes, overweight or obesity, physical inactivity and tobacco use.⁽¹⁸⁾ At one end of the spectrum are young individuals without atherosclerotic disease who have not yet been sufficiently exposed to the life-style and environmental factors responsible for this disease and its complications. Then, there are an increasing number of individuals who develop asymptomatic atherosclerosis as a consequence of their exposure to smoking, an unhealthy diet and sedentary life-style, which result in obesity, hypertension, dyslipidemia, diabetes and other risk factors for atherosclerosis and its complications.⁽¹⁹⁾ Physical activity has been proved to be effective in reducing cardiovascular risk factors in asymptomatic, special and diseased population.⁽²⁰⁾

For many students, college is a time of chronic stress, and students with greater perceived stress are more susceptible to headaches, sleep disturbances, and illnesses, such as the common cold.⁽²⁹⁻³²⁾ It is important for college students to establish a method for coping with chronic stress, and many students are enrolling in Yoga classes to reduce stress and experience relaxation. Yoga is an ancient discipline designed to bring balance and health to the physical, mental, emotional, and spiritual dimensions of the individual. Yoga is often depicted metaphorically as a tree and comprises eight aspects, or “limbs:” yama (universal ethics), niyama (individual ethics), asana (physical postures), pranayama (breath control), pratyahara (control of the senses), dharana (concentration), dyana (meditation), and Samadhi (bliss).⁽³³⁾

“Yoga” is practiced in India and all over world for over thousands of years. Due to its increased awareness in health and natural remedies, yogic techniques (including “asanas” and “pranayama”) are gaining importance and receiving worldwide acceptance. “Yoga” produces physiological changes which has a sound scientific basis.⁽³⁴⁾ Pranayama’ is a Sanskrit word - Prana and Ayama. ‘Prana’ means life or life Force. ‘Ayama’ means development or control. Therefore, Pranayama is the development and control of life force.⁽³⁵⁾ Asanas and pranayama have beneficial effect on the body; they improve the functions of different system of the body,

increasing longevity. They invigorate the activity of lungs and heart. They calm the mind, increase the concentration and give the ability to cope with tension. They are a complete system for personal development, promoting total physical and spiritual wellbeing.⁽⁴¹⁾

There are studies on effect of yoga and aerobics on physiological variables in healthy individual, but there were very few studies on specific vitals in Young adult females. So, this study is designed to see the effect of specific yoga program and aerobics program on vital parameters in young adult females.

METHOD AND MATERIALS

Total 100 subjects were taken according to inclusion criteria like Female age - 18-35 BMI - 18.5 to 24.9, Individual not engaged in fitness activity since last 1 year, Non-diabetic non-smoking and free of cardiovascular diseases, Subjects who were healthy based on a routine clinical examination, The students had no experience of practicing yoga and aerobics or any physical activity likes body building, walking, jogging, sports etc. Individuals with medical conditions like Cardiovascular disorders, Diabetes mellitus, Bronchial asthma, Endocrinal disorders, Depression, Epilepsy, Psychological disorders were excluded.

Institutional Ethics Committee of the Parul University approved the study.

Then subjects were selected randomly, they were allocated into two groups. Group-A (Specific Yoga Program Group) and Group-B (Aerobic Program Group) consisted 50 participants in each group. The total Treatment duration was 6- weeks. Follow up after 3 weeks. Initial evaluation of participants vital parameters like Blood pressure, Heart rate, Respiratory rate & Temperature were done prior and after intervention of each group.

Group A: Specific Yoga program group

Total duration: 45 minutes

- 3 asana & 3 pranayama include

3 asanas	3 pranayama
Padma Sana -10 min.	Nadi-shodana- 5 min
Sukhasana-10 min.	Kpalbhathi-5 min
Vajrasana-10 min.	Ujjayi-5 min.

Group B: Aerobics program-Intensity: moderate exercise intensity

- Warm up- gentle stretching exercise for 5minutes
- Aerobic Exercise- exercises like jogging for 5 minutes
- Walking & aerobics dance with music at 50-75% maximum heart rate for 30 minutes

Warm down phase: 5 minutes gentle stretching exercise

The first week of training was equivalent to 60% of the Maximum Heart Rate (HRmax) which progressively increased upto 80% HRmax in the treatment duration.

RESULT

In present study 100 subjects of age group of 18 to 35 years were taken and divided into two groups. Group A (Specific Yoga Program group) and Group B (Aerobics Program group). 93 individuals completed the study program without any complications. The data obtained in the both groups are as follows.

All data are presented as mean \pm standard deviation (SD). The pre and post-test data were analysed with a statistical paired sample t-test. Statistical significance was accepted at $P < 0.05$. The between group data were analysed with unpaired t-test.

Table - Demographic Data

Baseline Data	Group A (Y) (Mean)	Group B (A)(Mean)
Age	22.087	21.149
BMI	20.948	20.647
Heart Rate	76.00	80.1915
Systolic Blood Pressure	115.2174	111.7021
Diastolic Blood Pressure	75.6522	74.8936
Respiratory Rate	19.1957	20.7872
Temperature	94.2978	93.9723

Table - Mean and SD of Heart Rate of Group A and Group B

	Group-A		Group-B	
	Mean	Std. Deviation	Mean	Std. Deviation
HR pre	76.00	5.49	80.1915	8.85300
HRw3	79.57	7.11	87.9149	8.55374
HRw6	72.41	5.64	84.6170	7.99879

Table - Mean and SD of Respiratory rate of Group A and Group B

	Group-A		Group-B	
	Mean	Std. Deviation	Mean	Std. Deviation
RR Pre	19.1957	2.15633	20.7872	3.05697
RRW3	21.1957	3.08847	26.4681	3.65853
RRW6	18.5000	2.82646	24.4681	3.11972

Table- Mean and SD Systolic Blood Pressure of group A and group B

	Group-A		Group-B	
	Mean	Std. Deviation	Mean	Std. Deviation
SYS pre	115.2174	7.81427	111.7021	10.69725
SYSw3	117.6087	6.38915	122.5532	10.92824
SYSw6	110.0000	9.42809	123.6170	10.91977

Table- Mean and SD of Diastolic Blood Pressure of Group A and Group B

	Group-A		Group-B	
	Mean	Std. Deviation	Mean	Std. Deviation
DY pre	75.6522	5.43739	74.8936	7.18463
DYw3	76.7391	7.00931	75.1064	5.85043
DYw6	71.7391	12.34762	72.7660	4.52151

Table- Mean and SD of Temperature of Group A and Group B

	Group-A		Group-B	
	Mean	Std. Deviation	Mean	Std. Deviation
TEMP pre	94.2978	1.63890	93.9723	1.50025
TEMPW3	95.4152	1.45907	94.7851	2.08993
TEMPW6	95.9587	1.60811	94.9660	2.05027

Table: Heart Rate (HR) Between Group A & B Comparison

HR	t-value	p-value	Result
Pre-week3	1.978	.051	$P > 0.05$ not sig
Pre -week6	4.310	.000	$P < 0.05$ sig
Week 3-week 6	1.833	.070	$P > 0.05$ not sig

Table: Pre to 6-week Respiratory Rate (RR) comparison between A and B.

RR	t-value	p-value	Result
Pre-week 3	4.502	.000	$p < 0.05$ sig
Pre -week 6	3.932	.000	$p < 0.05$ sig
Week 3-week 6	.954	.342	$p > 0.05$ not sig

There is significant improvement between the group. Group-A yoga show better improvement.

Table: Systolic (SYS BP) Between Group A & B comparison

SYS BP	t-value	p-value	Result
Pre-week 3	2.868	.005	$p < 0.05$ sig
Pre -week 6	4.056	.000	$p < 0.05$ sig
Week 3-week 6	3.137	.002	$p < 0.05$ sig

Pre to 6-week comparison shows sig difference between A and B. there is improvement is more in A yoga group

Table: Diastolic (DY BP) Between Group A & B Comparison

DY BP	t-value	p-value	Result
Pre-week 3	.469	.640	p>0.05 not sig
Pre -week 6	.804	.423	p>0.05 not sig
Week 3-week 6	1.090	.279	p>0.05 not sig

Both groups show significant improvement

Table: Temperature (TEMP) Between Group A & B comparison

TEMP	t-value	p-value	Result
Pre-week3	.647	.519	p>0.05 not sig
Pre -week 6	.358	.721	p>0.05 not sig
Week 3-week 6	.684	.495	p>0.05 not sig

Both groups show significant improvement

DISCUSSION

Previously there were study done to check yoga and aerobics effect using different parameters with working women and middle-aged men but no study done with young adult females.

No group of researchers has sought to compare the effects of yoga and exercise in a systematic fashion with variety of patient populations. Nevertheless, the evidence presented that suggests that yoga interventions appear to be equal or superior to exercise in nearly every outcome measured except those involving physical fitness.

It is possible that the differences in fitness outcomes found in the comparison studies of yoga and exercise might not have been found if exercise were compared to the more vigorous forms of yoga. The differences that have been found between yoga and exercise interventions may be a result of how the two differ in their effects upon the SNS and HPA axis. Different levels of intensity of exercise have been shown to affect the HPA axis response to acute stress differently.⁽²⁰⁾

Low-intensity exercise repeatedly has been shown to lower cortisol levels while intense exercise leads to proportional increases in cortisol. The critical level of intensity that leads to release of cortisol is approximately 60% VO₂max, with the greater the exercise intensity, the greater the cortisol release. Perhaps this explains why yoga, involving slow and often non strenuous activities, positively affects the HPA axis response to stress. Exercise stimulates the SNS, raising plasma epinephrine and norepinephrine.⁽²⁰⁾

Yoga on the other hand, has been shown to lower sympathetic stimulation, significantly lowering levels of plasma norepinephrine and epinephrine.⁽²⁰⁾

K. Sandhi, Dr. CH. VST. Saikumar et al on his study result suggest that in (2015) Specific yoga program group and aerobic program group had significant reduction in systolic and diastolic blood pressure than the control group. The results of the study indicate that specific yoga program group had significant reduction the systolic and diastolic blood pressure than the aerobic program group.⁽²¹⁾

In the current trend the rational use of yoga practice and aerobic practice are needed to decrease the systolic and diastolic blood pressure. The dependability in formative the significant contribution of specific yoga program and aerobic program on systolic and diastolic blood pressure in this study was similar to the finding of other studies using yoga and aerobic program.

Indla & Pandurang (2011) reported that due to yoga practice systolic blood pressure was lowered to a highly significant level (P < 0.001). The diastolic blood pressure was reduced significantly (P < 0.001). Shantha (2007) stated that the yogasanas and aerobic training significantly reduce the blood pressure. Uthirapathy (2005) detailed that the yogic practices and aerobic exercises significantly reduce resting heart rate, systolic blood pressure, diastolic blood pressure, blood sugar and serum cholesterol level.

CONCLUSION

Regular practice of both Specific yoga and aerobics program showed clinical improvement in vital parameters like Heart rate, Respiratory rate, Systolic blood pressure, but specific yoga was statistically more significant when compared to aerobics program Where as in vital parameters like Diastolic blood pressure and Temperature, Specific yoga program and aerobics program both were clinically and statistically significant.

LIMITATION:

1. In yoga all sitting asana were performed & Aerobics all exercises were performed in standing.
2. Longer duration study may be required as diastolic blood pressure may change with long duration study period.

FURTHER RECOMMENDATION:

1. The same study can be done with standing asana.
2. The same study can be done on male participants.
3. The same study can be done with a longer follow-up.
4. The same study can be done with other age categories.

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