EFFECT OF YOGIC PRACTICES, AEROBIC TRAINING AND COMBINED TRAINING ON FLEXIBILITY OF DEGREE FEMALE STUDENTS

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Abstract: The present research is to identify the individual effect of yogic practices, aerobic training and combined training on flexibility of degree college female students. Eighty subjects (n=80) were randomly assigned to four equal groups. Each group contains 20 subjects and they were studying in government first grade college, Alnavar, Dharwad, Karnataka, India. The said subjects were assigned into four groups namely Experimental Group-I (YPG) treated as Yogic Practices; Experimental Group-II (ATG) treated as Aerobic Training; Experimental Group-III (CYPATG) treated as Combined Yogic Practices and Aerobic Training and Group-IV (CG) acted as control group. Flexibility was selected as a criterion variable for the study. The Pre test scores was collected for all the subjects on said groups on Flexibility by administering Sit and Reach Test measured in centimeters. Group-I practiced yogic asanas with pranayama and meditation; Group-II practiced aerobic exercises, and Group-III practiced both yogic asanas and aerobic exercises. The subjects of the control group were not allowed to participate in any training program, with the exception of routine activities. During the training period, experimental groups had undergone their training programme 3 days a week on alternate days for 12 weeks in addition to normal daily work. The post test mean scores on Flexibility was collected after the said treatments. The difference between pre, post and adjusted post test mean scores on Flexibility was considered as the effect of experimental treatments. The Analysis of Variance (ANOVA) and Analysis of Covariance (ANCOVA) were used to determine the significant mean differences for flexibility among degree college female students. Post hoc analysis was made by using LSD test, when obtained F value was significant. The SPSS Package was applied to get the results with the help of MS Excel program. The level of significant level was fixed at 0.05 level. The ANOVA and ANCOVA results found that yogic practices, aerobic training and combined training programmes had a significant impact on improving the flexibility among degree female students. Combined training of yogic practices and aerobic training was shows better in improving flexibility when compared with yogic practices and aerobic training..

Index Terms- Yogic Practices, Aerobic Training, Flexibility, Training, Groups, Degree Female Students

I. INTRODUCTION

The origin is a Sanskrit word ‘Yog’ which means union. Yoga is a union of the organ frameworks in the body with the cognizance in the mind. Logically, yoga creates a union of body, mind, and energy or soul or spirit to realize a condition of poise that is calmness. Yoga is a systemic practice of physical exercise, breath control, relaxation, diet control, and positive thinking and meditation meant for creating harmony in the body, mind, and condition. The practice involves low-sway physical action, stances called asanas, breathing a procedure that is pranayama, relaxation, and meditation. The majority of the general population knows about the physical postures or yoga positions yet don’t have the foggiest idea about that yoga includes quite a lot more.

In the health fields, yoga procedures are being connected in health promotion programs, substance misuse treatment programs, and as an integral treatment for diseases, for example, anxiety disorders, depression and coronary heart diseases. Yoga is a straightforward system with low cost, self-help approach to wellness.

Aerobics can be characterized as the type of physical exercise that joins stretching exercises alongside rhythmic oxygen consuming exercise. Aerobics are accomplished for advancing physical fitness and forestalling health illness. Fitness, in straightforward terms, can be characterized as a condition of good health and wellbeing. It is the ability of a person to perform adequately and productively in different types of work. High-impact exercise makes the heart increasingly proficient and equipped for moving more oxygen-conveying blood with each beat. The lungs adjust to have the option to take in more oxygen, and the muscles become prepared to utilize more oxygen.

Flexibility is the range of motion in a joint or gathering of joints or the ability to move joints viably through a total range of motion. Flexibility training incorporates stretching exercises to extend the muscles and may incorporate exercises like yoga or high-impact exercises. Improving an individual's Flexibility can help him/her turn all the more serenely for the duration of the day.

As indicated by the American Council on Exercise (ACE), Flexibility is characterized as "the range of motion of a given joint or gathering of joints or the dimension of tissue extensibility that muscle bunch possesses." That implies that each joint and each gathering of muscles in the body may have an alternate Range of Motion (ROM) or an alternate dimension of Flexibility. A few zones of an individual's body might be tight, implying that the muscles feel short and confined. A few zones of an individual's body may feel free and one might most likely extend and move those muscles uninhibitedly.

Bedekar and Hande (2017) identified to know the impact of yoga on Flexibility as a health related physical fitness of females and their age ranged between 18 to 25 years. The aftereffects of the examination showed that there was a noteworthy improvement in the Flexibility in the wake of experiencing a month of yoga when contrasted with that before yoga. Hovsepian (2013**)** investigated to identify the effect of yoga and aerobic trainings on flexibility of female college students and rehearsing yoga and aerobics two times every week for a quarter of a year and it was upgraded fundamentally. As for female college students, the influence is more maintaining health and wellness. Some of them failed to find success due to ill-health and reason is obesity. As one of the most effective way against obesity, physical exercise, especially yogic and aerobic exercises, can help reduce fat, reduce weight and change appearance. Regular yoga practice results in enhanced flexibility very rapidly as this process involves gentle stretching of muscle, connective tissues around bones and joints (Woodyard, 2011). Very few studies conducted on female students with regard to effect of yogic and aerobic exercises on health related physical fitness especially on flexibility at degree college level. Hence the present study is investigated to know the effect of combined and individual effects of yogic practices and aerobic training on flexibility of degree female students in degree colleges.

II. STATEMENT OF THE PROBLEM

The purpose of this research is to compare the effect of yogic practices, aerobic training and combined training on Flexibility of degree college female students. The topic selected for the study is "**EFFECT OF YOGIC PRACTICES, AEROBIC TRAINING AND COMBINED TRAINING ON FLEXIBILITY OF DEGREE FEMALE STUDENTS."**

III. STATEMENT OF HYPOTHESIS

It was hypothesized that there would be a significant difference in the Flexibility of experimental groups due to 12 weeks practice of yogic practices, aerobic training and combined training of both yogic practices and aerobic training.

IV. METHODOLOGY

The present research work aimed at understanding the effect of yogic practices, aerobic training and combined training on flexibility among degree female students. Eighty subjects (n=80) were randomly assigned to four equal groups. Each group contains 20 subjects and they were studying in government first grade college, Alnavar, Dharwad, Karnataka, India. The above subjects were assigned into Experimental Group-I (YPG) treated as Yogic Practices Group; Experimental Group-II (ATG) treated as Aerobic Training; Experimental Group-III (CYPATG) treated as Combined Yogic Practices and Aerobic Training and Group-IV (CG) acted as control group. The Pre test scores were collected for all the subjects of said groups on Flexibility by conducting Sit and Reach Test measured in centimeters.

Experimental groups: Group-I practiced yogic asanas with pranayama and meditation; Group-II practiced aerobic exercises; and Group-III practiced both yogic asanas and aerobic exercises. The yogic exercises are practiced by yoga prayer with general warming up exercises, suryanamaskara and asanas like Aradakati Chakrasana, Ardha Halasana,Baddakonasana, Bujangasana,

Dhanurasana, Makarasana, Matsyasana, Navasana, Padmasana, Parivrutha Trikonasana, Paschimothasana, Setu Bandha Sarvangasana, Shalabasana, Sukhasana, Supta Pawanmuktasana, Tadasana, Ustrasana, Uttapadasana, Vajrasana, Veerabadrasana, along with pranayama, meditation and shavasana. The aerobic training includes exercises of Diamond shape movement, Double step, Jog and run, Jumping Jack, Kicking Jump Rope, Low impact March on the spot, low impact on the spot running, March forward and backward, On the spot running, Rope skipping, Sideward moment, Stair climbing, Step touch, Step–up Exercises, Two count jumping jacks, V Step, Walk and Walk Forward. The subjects of the control group were not allowed to participate in any training program, with the exception of routine activities.

During the training period, experimental groups had undergone their training program 3 days a week on alternate days for 12 weeks in addition to normal daily work. The post test mean score of Flexibility was collected after the said treatments. The difference between pre, post and adjusted post tests mean scores on Flexibility was considered as the effect of experimental treatments. Analysis of Variance (ANOVA) and Analysis of Covariance (ANCOVA) were used to determine the significant mean scores for Flexibility. Post hoc analysis was made by using LSD test when obtained F value was significant. The SPSS Package was utilized to get the results with the help of MS Excel program. The level of significant level was fixed at 0.05 level.

V. ANALYSIS OF THE DATA

ANOVA and ANCOVA results on Flexibility of degree college female students due to variations in the experimental treatments of yogic practices, aerobic training & combined training among control and experimental groups namely Control Group (CG); Yogic Practices Group (YPG); Aerobic Training Group (ATG); and Combined Yogic Practice & Aerobic Training Group (CYPATG) and the results are presented in the following tables

Table-1: Analysis of Variance and Analysis of Covariance on Flexibility among CG, YPG, ATG and CYPATG.

	CG	YPG	ATG	CYPATG	Sources of Variance	Sum of Squares	df	Mean Square	F Value and Sig. level
Pre Mean	9.225	9.950	9.750	9.325	Between	7.113	3	2.371	0.077^{NS} (P=0.972)
					Within	2349.075	76	30.909	
Pre SD	5.468	6.303	4.595	5.733	Total	2356.188	79		
Post Mean	9.325	13.550	12.850	14.150	Between	280.484	3	93.495	3.103* (P=0.032)
Post SD	5.424	6.396	4.490	5.479	Within	2290.188	76	30.134	
					Total	2570.672	79		
Adjusted Post Mean	9.652	13.175	12.668	14.380	Contrast	242.395	3	80.798	71.485* (P=0.000)
					Total	84.771	75	1.130	

^{NS}Not Significant; (df 3, 75/76); *Significant at 0.05 (Table F value is 2.72)

The table-1 illustrates the pre-test mean scores of Flexibility (in scores) of CG, YPG, ATG and CYPATG are 9.225, 9.950, 9.750 and 9.325 and the standard deviations are 5.468, 6.303, 4.595 and 5.733 respectively. The obtained 'F' value of 0.077 for pre-test mean scores of Flexibility is less than the table value 2.72 for df 3 and 76 required for significance at 0.05 level. This indicates insignificant difference in the pre test scores of Flexibility among the groups.

The table also explains post-test mean scores of Flexibility of CG, YPG, ATG and CYPATG are 9.325, 13.550, 12.850 and 14.150 and the standard deviations are 5.425, 6.396, 4.490 and 5.479 respectively. The obtained 'F' value of 3.103 on post-test mean scores on Flexibility is greater than the table value 2.72 for df 3 and 76 required for significance at 0.05 level. This

indicates significant difference in the post test scores of Flexibility of degree college female students among the experimental groups after the varied treatments.

Further, the above table shows the mean scores of Flexibility of CG, YPG, ATG and CYPATG are 9.652, 13.175, 12.668 and 14.380 respectively. The obtained 'F' value of 71.485 on adjusted post-test mean scores of Flexibility is greater than the table value 2.72 for df 3 and 75 required for significance at 0.05 level. This indicated that there is a significant difference in adjusted mean scores of Flexibility of degree college female students. Since significant F ratio was obtained, the result related to Flexibility is further subjected to post hoc analysis by using LSD test and results presented in Table-2.

Table-2. LSD Post Hoc Analysis Results on Flexibility (In scores) of degree college female students among control and experimental groups (CG, YPG, ATG and CYPATG).

Groups				Mean Difference (MD)	Critical Difference(CD)
CG	YPG	ATG	CYPATG		
9.652	13.175	×	×	3.523*	0.823
9.652	×	12.668	×	3.016*	
9.652	×	×	14.380	4.728*	
×	13.175	12.668	×	0.507	
×	13.175	×	14.380	1.205*	
×	×	12.668	14.380	1.712*	

*Significant at 0.05 of confidence.

The table-2 shows that the adjusted post-test mean differences on Flexibility between CG & YPG; CG & ATG; CG & CYPATG groups are 3.523, 3.016 and 4.728 respectively which are higher than the critical difference of 0.823 at 0.05 level of confidence. The finding concludes that there is significant difference on Flexibility of degree college female students between CG & YPG; CG & ATG; CG & CYPATG and shows that yogic practices, aerobic training and combined training had improved flexibility among degree college female students. The post hoc analysis also shows significant difference between YPG & CYPATG; and ATG & CYPATG groups are 1.205 and 1.712 respectively which are higher than the critical difference of 0.823 at 0.05 level of confidence and this concludes that combined training is more effective in increasing the flexibility when YPG and ATG. The adjusted post test mean difference on flexibility between YPG and ATG group is 0.507 which is less than the critical difference of 0.823 at 0.05 level of confidence. This concludes that both yogic practices and aerobic training individually does not differ in improving flexibility among degree college female students. The comparison of pre, post and adjusted post-test mean scores of flexibility of degree college female students among control and experimental groups are graphically depicted in Fig.1.

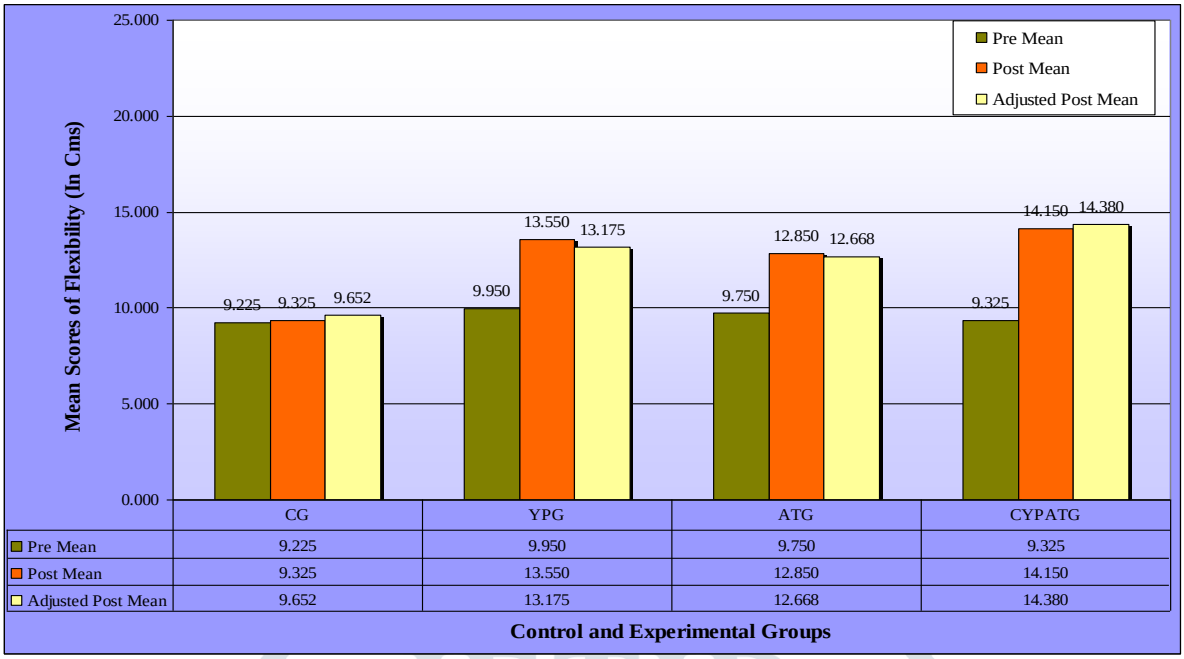

Fig.1: Bar diagram of Pre, Post and Adjusted Post-test Mean scores of Flexibility of degree college female students among control and experimental groups.

VI. DISCUSSION OF RESULTS

The experimental study reveals that yogic practices, aerobic training and combined training groups made positive effect on increasing flexibility among the degree college female students. Hence the stated hypothesis was accepted. It was concluded that said trainings significantly increased the flexibility among degree college female students. The results suggested that combined physical exercises such as yogic practices and aerobic exercises as an appropriate, easy and affordable approach to increase flexibility among the degree college female students. The similar results were concurred with previous studies conducted by Bedekar, Chinmayee and Deepal (2017) and Hovsepian (2013). The present study would provide a scientific base and guidance to the coaches to design the training programme for female degree college students to improve the flexibility level.

V. CONCLUSION

From the study, it was concluded that yogic practices, aerobic training and combined training programmes had a significant impact on increase flexibility among degree college female students. Combined training of yogic practices and aerobic training proved to be better in increasing flexibility when compared with yogic practices and aerobic training individually.

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