



P-ISSN: 2394-1685

E-ISSN: 2394-1693

Impact Factor (ISRA): 5.38

IJPESH 2021; 8(3): 239-242

© 2021 IJPESH

[www.kheljournal.com](http://www.kheljournal.com)

Received: 06-03-2021

Accepted: 25-04-2021

#### G Malini

Ph.D., Research Scholar, School of Yoga Studies, Chidambaram, Tamil Nadu, India

#### Dr. R Saravanan

Assistant Professor, Department of Physical Education, Annamalai University, Chidambaram, Tamil Nadu, India

## Effect of yogic practices on flexibility resting pulse rate and anxiety among geriatric population

G Malini and Dr. R Saravanan

### Abstract

**Purpose of the study:** The purpose of the present study was to find out the effect of yogic practice on flexibility, resting pulse rate and anxiety among male geriatric population.

**Materials and Methods:** For this purpose, thirty geriatric men those who were residing at Anbagam Old Age Home, Mariappanagar, Annamalai town, Cuddalore district, Tamil Nadu, India were selected as subjects. The age of the subjects were ranged from 65 to 70 years. They were divided into two equal groups, each group consisted of fifteen subjects, in which experimental group - I underwent yogic practice, and group - II acted as control that did not participate in any special activities apart from their regular day-to-day activities. The training period for the study was six days (Monday to Saturday) in a week for twelve weeks. Prior and after experimental period; the subjects were tested on flexibility, resting pulse rate and anxiety. Flexibility was measured by sit and reach test, resting pulse rate was assessed by counting the pulse for one minute and anxiety was assessed by Taylor's Manifest Anxiety Scale.

**Statistical tool used:** The examination of 't' - test and assumption of equality of variance (Leven's test-homogeneity) and analysis of covariance (ANCOVA) was utilized to discover the critical contrast, assuming any, between groups on each selected variables, independently. In all the cases, 0.05 degree of certainty was fixed to test the importance, which was considered as proper.

**Results:** The result of the study shows that the yogic practice group improves the flexibility, and decreased the resting pulse rate and anxiety significantly.

**Conclusions:** It was concluded from the results of the study that yogic practice has bring positive changes in flexibility, resting pulse rate and anxiety as compare to the control group.

**Keywords:** Yogic practice, flexibility, resting pulse rate, anxiety

### Introduction

Geriatrics is the part of medical care that centers around our extraordinary necessities as we age. Similarly as pediatricians represent considerable authority in the wellbeing needs of youngsters, geriatricians have some expertise in the wellbeing needs of more seasoned individuals. Geriatrics alludes to clinical consideration for more seasoned grown-ups, an age group that is not difficult to characterize decisively. "Older" is liked over "aged," however both are similarly indefinite; >65 is the age frequently utilized, yet a great many people needn't bother with geriatrics mastery in their consideration until age 70, 75, or even 80. Gerontology is the investigation of maturing, including biologic, sociologic, and psychological changes. Around the year 1900 in the US, individuals > 65 represented 4% of the populace; presently they represent >14% (almost 50 million, with a net addition of 10,000/day) [1]. Geriatricians prevent, oversee and create care designs that address the unique medical issues of the older [2]. It has been assessed that the ACHD populace increments at 5% annually [3-6]; hence, there would have been an extra 4,00,000 expansion in this populace from 2000 to 2012.

India, the world's second most crowded nation, has encountered a sensational segment change in the previous 50 years, involving very nearly a significantly increasing of the population over 60 years old (i.e., the elderly) [7]. This example is ready to proceed. It is projected that the extent of Indians matured aged is 60 and more established will ascend from 7.5% in 2010 to 11.1% in 2025 [8]. The quantity of old in India is projected to arrive at 158.7 million of 2025 [9], and is normal, by 2050, to outperform the number of inhabitants in youngsters under 14 years [10].

#### Corresponding Author:

#### G Malini

Ph.D., Research Scholar, School of Yoga Studies, Chidambaram, Tamil Nadu, India

Physical work and exercise have numerous valuable impacts for looking after wellbeing, forestalling age-related persistent illnesses and improving personal satisfaction of elderly peoples [11-13].

Yoga means "association/union". It is the Sanskrit progenitor of the English word "Yoga". Hence, it comes to mean a technique for profound association [14]. Yoga can assist human being with building up an exceptional complete in his understanding as nothing else can, accordingly tearing the cloak of separateness and discontinuity from our scholarly perception [15]. Yoga practice can expand our lung limit and breath, improves the capacity to oppose stress, lessen body weight and size, decline the cholesterol and glucose levels and consequently flexibility out reestablish and vitalize the body's common frameworks [16].

The proposed advantages of normal yoga practice are numerous and shifted, remembering increments for muscular strength, flexibility and flexibility, decreased stress, anxiety and depression, and an upgrade of by and large prosperity and personal satisfaction [17]. Strangely, the discoveries of an efficient review of 16 investigations (n = 649) [18] and a later preliminary of 118 members [19] show that Yoga (of different kinds) may give more noteworthy upgrades in actual working and self-revealed wellbeing status than traditional active work mediations in older individuals [20]. Yoga has been found to control hypertension in the older, however the hidden advantages of component comparable to oxidative pressure guideline stays hazy. Yoga for seniors can help forestall the beginning of osteoporosis, which makes bones become fragile or feeble [21]. The benefits of yoga for seniors are: 1. To prevent the onset of osteoporosis, 2. Stress will be reduced which helps to reduce the hypertension causes anxiety, heart rate, blood pressure and helps to breathe easier, 3. Improved the sleeping time, 4. Reduced the risk of depression and alleviate the aches and pains by improving their flexibility and fitness [22].

### Hypotheses

Based on the collected research literatures, the following hypotheses were drawn:

1. There would be significant improvement in selected dependent variables for yogic practice group.
2. There would not be significant improvement in selected dependent variables for control group.

### Methodology

The purpose of this study was to find out the effect of yogic practices on flexibility, resting pulse rate and anxiety among geriatrics. To achieve the purpose of the present study, 30 geriatric men from Anbagam Old Age Home, Mariappanagar, Annamalainagar town, Cuddalore district, Tamil Nadu were randomly selected as subjects. The age of the subjects were ranged from 65 to 70 years (mean age = 68.4 ± 0.5 years). The selected subjects were divided into two equal groups of fifteen subjects each. Group - I considered as experimental group who underwent yogic practices for twelve weeks, six days (Monday to Friday) per week on selected yoga exercises (Table – 1) and the same were taught by yoga teachers from School of Yoga Studies, Annamalai University, Annamalainagar, Chidambaram and group - II considered as control that did not undergo any training programme or physical activity (either strenuous or recreational) throughout the experimental period.

### Selection of asanas

The training variable is the yogasanas and it's been incalculable. Subsequently, the researcher talked with

specialists in the field of yogasana and the chose asanas are introduced in the Table – 1.

**Table 1:** Training schedule for yogic practice group

Weeks	Name of the asanas (Maintaining duration in minutes: Recovery)
1 – 4	Suryanamaskar (10 Min: 5 Min), Utthita trikonasana (1: 1), Janu sirsasana (1: 1), Marichyasana (1: 1) - All 2 repetitions, Shavasana (2 min), Pranayama –Bhramari (1 min), Meditation – Omkar (2 min)
5 – 8	Suryanamaskar (10 Min: 5 Min), Utthita trikonasana (1: 1), Janu sirsasana (1: 1), Marichyasana (1: 1) Prasarita padottanasana (30 sec: 30 sec), Adhomukha svanasana (30 sec: 30 sec), Ustrasana (1 min: 1 min) - All 2 repetitions, Shavasana (2 min), Pranayama –Basthikara (1 min), Meditation – Omkar (2 min)
9 – 12	Suryanamaskar (10 Min: 5 Min), Utthita trikonasana (1: 1), Janu sirsasana (1: 1), Marichyasana (1: 1) Prasarita padottanasana (30 sec: 30 sec), Adhomukha svanasana (30 sec: 30 sec), Ustrasana (1 min: 1 min) - All 2 repetitions, Uttanasana (30 sec: 30 sec), Baddha konasana (1 min: 1 min), Setu bandha sarvangasana (30 sec: 30 sec) - All 3 repetitions, Shavasana (2 min), Pranayama –Nadisodhana (1 min), Meditation – Omkar. (2 min).

### Analysis of the data

The data were collected on selected criterion variables such as flexibility was sit and reach test, resting pulse rate was assessed by counting the pulse for one minute and anxiety was assessed by Taylor's Manifest Anxiety Scale. The examination of 't' – test and assumption of equality of variance (Leven's test-homogeneity) and covariance (ANCOVA) was utilized to discover the critical contrast, assuming any, between groups on each chose basis factors, independently. In all the cases, 0.05 degree of certainty was fixed to test the importance, which was considered as proper. Table – 2 present pre and post-test means and the results of the paired sample t – test of yogic practice group and control group on selected dependent variables such as, flexibility, resting pulse rate and anxiety.

**Table 2:** Paired sample t = test of yogic practice group and control group on selected dependent variables

Name of the group	Name of the dependent variable	Pre-test mean	Post-test mean	't' - ratio
Yogic practice group	Flexibility	3.307	3.55	2.15*
	Resting pulse rate	83.13	80.87	2.30*
	Anxiety	17.00	14.73	4.28*
Control group	Flexibility	3.313	3.247	1.021
	Resting pulse rate	83.47	83.33	0.112
	Anxiety	16.67	16.53	0.26

\*Significant at 0.05 level of confidence. (Required table value for significance at 0.05 level of confidence with df 28 was 1.701).

### Yogic practice group

**Testing of hypotheses 1:** The paired sample 't' was computed on selected dependent variables. The results were presented in the above Table – 2. The 't' value for flexibility, resting pulse rate, and anxiety were 2.15, 2.30 and 4.28 respectively. All the 't' values are significantly higher than the required table value of 28 at 0.05 level of confidence was 1.701.

**Table 2:** Testing of hypotheses – 1

Researcher's hypothesis (H1)	There would be a significant improvement in the selected dependent variables due to yogic practice	Accepted
Null hypothesis (H0)	There would be a significant improvement in the selected dependent variables due to yogic practice.	Rejected

The results of the study shows that all selected dependent variables such as, flexibility, resting pulse rate and anxiety were significantly improve the performance due to the 12 week yogic practices. Hence, researcher's hypothesis was accepted and the null hypothesis was rejected.

### Control group

#### Testing of hypotheses – 2

The paired sample 't' was computed on selected dependent variables. The results were presented in the above Table – 3. The 't' value for, flexibility, resting pulse rate, and anxiety were 1.021, 0.112 and 0.26 respectively. All the 't' values are significantly lower than the required table value of 28 at 0.05 level of confidence was 1.701.

**Table 3:** Testing of hypotheses – 2

Researcher's hypothesis (H1)	There would not be a significant improvement in the selected dependent variables among control group	Accepted
Null hypothesis (H0)	There would not be a significant improvement in the selected dependent variables among control group	Rejected

The results of the study shows that all selected dependent variables such as, flexibility, resting pulse rate, and anxiety were not significantly improve the performance for control group. Hence, researcher's hypothesis was accepted and the null hypothesis was rejected.

#### Assumptions for ANCOVA

A preliminary analysis was conducted to determine whether

**Table 5:** Analysis of covariance on flexibility, arterial blood pressure and stress of yogic practice group and control group

Variable name		Yogic practice group	Control group	'F' ratio
Flexibility (In inches)	Pre-test Mean $\pm$ S.D	3.307 $\pm$ 0.18	3.313 $\pm$ 0.16	0.012
	Post-test Mean $\pm$ S.D.	3.55 $\pm$ 0.41	3.247 $\pm$ 0.20	6.92*
	Adj. Post-test Mean	3.558	3.242	14.46*
Resting pulse rate (In mm Hg)	Pre-test Mean $\pm$ S.D	83.13 $\pm$ 2.77	83.47 $\pm$ 3.60	0.104
	Post-test Mean $\pm$ S.D.	80.87 $\pm$ 2.62	83.33 $\pm$ 3.60	4.61*
	Adj. Post-test Mean	80.036	83.164	19.60*
Anxiety (Points)	Pre-test Mean $\pm$ S.D	17.00 $\pm$ 1.51	16.67 $\pm$ 1.40	0.393
	Post-test Mean $\pm$ S.D.	14.73 $\pm$ 1.37	16.53 $\pm$ 1.41	12.45*
	Adj. Post-test Mean	14.597	16.67	58.21*

\*Significant at 0.05 level of confidence.(The table values required for significance at 0.05 level of confidence for 1 and 28 & 1 and 27 are 4.20 and 4.21 respectively).

#### Results of the study

Table 5 shows that pre-test means 'f' - ratio of yogic practice group and control group on flexibility was 0.012 which is insignificant at 0.05 level of confidence. The post and adjusted post-test means 'f' - ratio value of experimental group and control group was 6.92 and 14.46, which was significant at 0.05 level of confidence. The pre-test means 'f' - ratio of yogic practice group and control group on resting pulse rate was 0.104, which was insignificant at 0.05 level of confidence. The post and adjusted post-test mean 'f' - ratio value of experimental group and control group was 4.61 and 19.60, which was significant at 0.05 level of confidence. The pre-test means 'f' - ratio of yogic practice group and control group on stress was 0.393 which was insignificant at 0.05 level of confidence. The post and adjusted post-test mean 'f' - ratio value of experimental groups and control group was 12.45 and 58.21, which was significant at 0.05 level of confidence.

the prerequisite assumptions of ANCOVA were met before preceding the Univariate Analysis. Thus, the assumption of equality of variance (Levene's test-homogeneity) the linear regression relationship between the covariates and the dependent variables and homogeneity of regression slopes was examined.

**Table 4:** Levene's test of equality of error variances on selected criterion variables among groups

Variables	F - ratio	df -1	df -2	Sig.
Flexibility	0.89	1	28	0.354
Resting pulse rate	2.90	1	28	0.10
Anxiety	0.023	1	28	0.879

(The table value required for 0.05 level of significance with df 1 & 28 is 4.20).

Homogeneity of variances is a term that is used to indicate that groups have the similar variances. Thus, in Levene's test of equality of the error variance table, the obtained F-values of the selected dependent variables were less than the confidence interval value of 0.05, which indicates that the variance of each group was not significantly different from one another during pre-test period. Therefore, the homogeneity of variance comparing the two groups regardless of the ability level for each of the dependent variables indicated that homogeneity of variance has been met for all the three dependent variables at significant 0.05 level of confidence. Hence it was concluded that the assumption of homogeneity of variance has been met for computing Univariate ANCOVA.

#### Conclusions

Flexibility was improved for yogic practice group [23-25] when compared with the control group. Yogic practice group also decreased the resting pulse rate [26] and anxiety [27] when compared with the control group. The overall study indicates that the yoga practice is a better tool to improve the physical fitness, physiological and psychological fitness. Yoga is a tool to know the fall risk factors (poor flexibility, impaired mobility, reduced strength and flexibility) and increase the level flexibility in older adults [28].

The present study indicates that the twelve weeks of yogic practices is the best tool to improve the flexibility for male geriatric population. Moreover, the decrease of resting pulse rate and anxiety was significant for the yogic practice group when compared with the control group. The overall study indicates that there was a significant improvement in flexibility and decrease in resting pulse rate and anxiety after the yogic practice session for male geriatric population.



**Reference**

1. Besdine Richard W. Introduction to Geriatrics. Retrieved from <https://www.msmanuals.com/en-in/professional/geriatrics/approach-to-the-geriatric-patient/introduction-to-geriatrics> on 27-3-2021.
2. Retrieved from <file:///E:/all%20new/scr/malini/What%20is%20Geriatrics.html> on 23-02-2021.
3. Hoffman JI. "Congenital Heart Disease: Incidence and Inheritance". *Pediatr Clin North Am* 1990;37:25–43.
4. Brickner ME, Hillis LD, Lange RA. "Congenital Heart Disease in Adults: First of Two Parts". *N Engl J Med* 2000;342:256–263.
5. Perloff JK, Warnes CA. "Challenges Posed by Adults with Repaired Congenital Heart Disease". *Circulation* 2001;103:2637–2643.
6. Niwa K, Perloff JK, Webb GD, Murphy D, Liberthson R, Warnes CA, Gatzoulis MA. "Survey of specialized tertiary care facilities for adults with congenital heart disease". *Int J Cardiol* 2004;96:211–216.
7. Government of India. "National Programme for the Health Care of the Elderly (NPHCE), Operational guidelines". New Delhi: Government of India 2011.
8. United Nations Department of Economic and Social Affairs, Population Division. *World Population Prospects (2008 Revision) 2008*. Available: <http://esa.un.org/unpp/index.asp?panel=2>
9. Raju S. *Ageing in India in the 21st Century: A Research Agenda*. Mumbai: The Harmony Initiative 2006. Available: [http://harmonyindia.org/hdownloads/Monograph\\_FINAL.pdf](http://harmonyindia.org/hdownloads/Monograph_FINAL.pdf).
10. Nelson ME, Rejeski WJ, Blair SN, Duncan PW, Judge JO, King AC. "Physical Activity and Public Health in Older Adults: Recommendation from the American College of Sports Medicine and the American Heart Association". *Med Sci Sports Exerc* 2007;39:1435-45.
11. Cornelissen VA, Arnout J, Holvoet P, Fagard RH. "Influence of Exercise at Lower and Higher Intensity on Blood Pressure and Cardiovascular Risk Factors at Older Age". *J Hypertens* 2009;27:753-62.
12. Heckman GA, McKelvie RS. "Cardiovascular Aging and Exercise in Healthy Older Adults". *Clin J Sport Med* 2008;18:479-85.
13. Prabhavananda Swami. "Patanjali Yoga sutras", Chennai: The President Sri Ramakrishna Math 2002, 1.
14. Nagendra HR. "Yoga a Way of Life", Chennai: Vivekananda Kendra Prakashan Trust 2001, 9.
15. Viswanathan S, Usha J. "U.G. & P.G. Diploma in Yoga", Annamalainagar, Annamalai University 2002, 5.
16. Woodyard C. "Exploring the Therapeutic Effects of Yoga and Its Ability to Increase Quality of Life". *Int. J Yoga* 2011;4(2):49–54.
17. Patel NK, Newstead AH, Ferrer RL. "The Effects of Yoga on Physical Functioning and Health Related Quality of Life in Older Adults: A Systematic Review and Meta-Analysis". *J Altern Complement Med* 2012;8(10):902–17.
18. Gothe NP, McAuley E. "Yoga is as Good as Stretching-Strengthening Exercises in Improving Functional Fitness Outcomes: Results From a Randomized Controlled Trial", *J Gerontol A Biol Sci Med Sci* 2016;71(3):406–11.
19. [Patil SG, Dhanakshirur G, Aithala MR, Das KK. "Comparison of the Effects of Yoga and Lifestyle Modification on Grade-I Hypertension in Elderly Males: A Preliminary Study". *Int J Clin Exp Physiol* 2014;1:68-72.
20. Retrieved from <https://www.asccare.com/yoga-for-seniors/> on 12-03-2021.
21. "Yoga for Seniors: Exercise and Fitness". Available on American Senior Communities 2016. <https://www.asccare.com/yoga-for-seniors/> on 27-4-2021.
22. Anne Tiedemann, Sandra O' Rourke, Romina Seslo, Catherine Sherrington. "A 12-Week Iyengar Yoga Program Improved Flexibility and Mobility in Older Community-Dwelling People: A Pilot Randomized Controlled Trial". *J Gerontol A Biol Sci Med Sci* 2013;68(9):1068-75.
23. Divya Sivaramakrishnan, Claire Fitzsimons, Paul Kelly, Kim Ludwig, Nanette Mutrie, David H. Saunders and Graham Baker. "The Effects of Yoga Compared to Active and Inactive Controls of Physical Function and Health related Quality of Life in Older Adults-Systematic Review and Meta-Analysis of Randomised Controlled Trials". *International Journal of Behaviour Nutr Phys Act* 2019;16(1):33-45.
24. Narjes Nick, Peyman Petramfar, Fariba Ghodsbin, Sareh Keshavarzi, Iran Jahanbin. "The Effect of Yoga on Flexibility and Fear of Falling in Older Adults". *PMR* 2016;8(2):145-51.
25. Mooventhan A, Nivethitha L. "Evidence Based Effects of Yoga Practice on Various Health Related Problems of Elderly People: A Review". *Journal of Bodywork and Movement Therapies* 2017;21(4):1028–1032.
26. Juliane Vogler, Lilly O'Hara, Jane Gregg, Fiona Burnell. "The Impact of a Short-Term Iyengar Yoga Program on the Health and Well-being of Physically Inactive Older Adults". *International Journal of Yoga Therapy* 2011;21(1):61-72.
27. Schmid AA, Van Puymbroeck M, Kocreja DM. "Effect of a 12-week yoga intervention on fear of falling and flexibility in older adults: A pilot study". *Arch Phys Med Rehabil* 2010;91:576-83.