



## IMMEDIATE EFFECT OF YOGIC ASANAS ON HEART RATE

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### ABSTRACT :

*In Human body there was a special organ which works continuously throughout the life without any break. This organ is known as Heart. It pumps blood throughout the body which provide the essential component to the different part of body. The pumping action of heart is known as heartbeat. Number of heart beat in one minute is called as heart rate. Heart rate is the indicator of alive, without any one of these, people cannot alive. Breathing process fulfills the requirement of oxygen and removes carbon dioxide from the body. Oxygen is used by the different cells, tissues and body parts to produce energy and carbon dioxide. Supply of oxygen and removal of carbon dioxide is done by the blood. When heart contract blood moves forward in the blood vessels and flow in the entire body. HR was influenced by exercise and training. Beside these HR was also influenced by posture, stress (both mental and physical) sex, age, emotion and environmental conditions .*



**KEYWORDS :** Human body , carbon dioxide , emotion and environmental conditions .

### INTRODUCTION :

So, it was fact that HR was influenced by many factors. Age and posture are two important factors out of these factors. Asanas are most important part of yoga. According to the available literature there are eighty-four lakhs asanas. According to scripture lord Shiva was the founder of all yoga and he creates all asanas. Asanas are nothing but the pattern of sitting of different species used by them for comfortable sitting. According to the Patanjali "Sthir – Sukham – Asaman" that mean steady and comfort sitting position is known as asanas. All most every asanas might be influenced the HR in different ways. In some asanas it may be increased and in some asanas it may be decreased. The effect any activity on human being could be studied from two angles i.e. the immediate effect/ change (E/C) and long term E/C. The immediate E/C of any activity was more than the long term E/C and this was higher in untrained person than the trained person. Hence the problem of the study was "Immediate effect of yogic asanas on heart rate" and its objective was to (1) compare the post data and pre data mean of each asanas, (2) compare the combine post data means of all the asanas between various age groups, (3) compare the combine post data means of each asanas and (4) compare the combine post data mean of all the age groups

### METHODOLOGY

The purpose of the study was to check the immediate effect of different asanas of heart rate. So, the study was delimited to male subjects with the three various age groups – 20 years to 30 years (Gr. I), 30 years to 40 years (Gr. II), 40 years and above (Gr. III) and also for the thirty different asanas which

were - Tadasana (AS1), Trikonasana (AS2), Vrikshasana (AS3), Utkatasana (AS4), Garudasana (AS5), Natarajasana (AS6), Uttanasana (AS7), Vakasana (AS8), Padmasana (AS9), Vajrasana (AS10), Suptha Vajrasana (AS11), Matsyasana (AS12), Tulasana (AS13), Parvatasana (AS14), Paschimothanasana (AS15), Ushtrasana (AS16), Naukasana (AS17), Vakrasana (AS18), Viparitha Karni (AS19), Sarvangasana (AS20), Halasana (AS21), Shirshasana (AS22), Setu Bandasana (AS23), Chakrasana (AS24), Bhujangasana (AS25), Shalabhasana (AS26), Makarasana (AS27), Dhanurasana (AS28), Pavanamuktasana (AS29) and Shavasana (AS30). Tested variables for the study were heart rate (HR). Heart rate was measured automatically by the instrument and it was number of beats per minute. 37 (Thirty seven) untrained male in each 3 age groups and total subjects 111 (One Hundred Eleven) were selected from Kanpur (UP), Kannuj (UP), Farrukabad (UP), Fatehgarh (UP) and Bidhuna (UP) city on the basis of availability. Selected subjects have knowledge of yoga and they were practicing yoga itself either in the different groups or either in the yoga centre.

Pre – data or normal HR was measured after giving 5 to 10 minutes of rest in shavasana/ supine position. It was taken once in the beginning of the data collection and common for all 30 asanas, whereas as the post data for all 30 asanas was different and collected in 3 days. Data of HR was collected in the final position of every asanas by digital blood pressure instrument. In between the two asanas 2 to 5 minute of rest in supine/ prone position was given to the subjects, so that he comes in normal condition and prepares himself for the next asana. For determining significant difference exist between pre data and post data of HR correlated 't' test was used. For determining significant change in gain score of HR on different age groups, an analysis of variance (ANOVA) and LSD post hoc test was used to check mean pair differences. Gain scores for selected variables were calculated by the following method "Post data – Pre data". The +ve value of gain indicates that post data value was higher than the pre data (normal) value and –ve value of gain indicates that post data value was lower than the pre data (normal) value. The significance difference was checked at 0.05 level.

Pramanik, Sharma, Mishra, Mishra, Prajapati and Singh<sup>4</sup> evaluate the immediate effect of slow pace bhastrika pranayama heart rate and blood pressure. Result indicates that both the systolic and diastolic blood pressure decreased significantly with a slight fall in heart rate. Gore and Bhole<sup>19</sup>, study on the influence of Paschimothanasana on heart rate result shows that heart rate increased by 4% which was non-significant. Chakraborty made a comparative study of specific exercise and asanas on and clinical findings HR, RR & BP on adults. Asanas group indicate non -significant result. Gunde, Bera and Gore were study the effects of some selected yogasanas and similar type of exercises on selected neurophysiological variables. Result concluded that HR, BP, PR and SpO2 was significant increased when asanas performed like exercise.

## Findings

The data was analyzed and results of the study was presented in the different tables-

**Table - 1**  
**'t' TEST VALUE OF HEART RATE AND BREATHING FREQUENCY**

S No	Name of Asana		Heart Rate		
			Mean	M. Diff	't' – test
1	Normal		71.315		
2	Tadasana	AS1	82.180	10.865	13.317*
3	Trikonasana	AS2	87.775	16.459	21.498*
4	Vrikshasana	AS3	82.586	11.270	17.217*
5	Utkatasana	AS4	90.495	19.180	25.074*
6	Garudasana	AS5	87.189	15.874	20.002*
7	Natarajasana	AS6	86.991	15.676	18.717*
8	Uttanasana	AS7	87.477	16.162	21.307*
9	Vakasana	AS8	100.072	28.757	29.114*

10	Padmasana	AS9	81.207	9.892	16.469*
11	Vajrasana	AS10	80.486	9.171	15.390*
12	Suptha Vajrasana	AS11	85.306	13.991	22.307*
13	Matsyasana	AS12	85.216	13.901	20.159*
14	Tulasana	AS13	91.856	20.541	23.110*
15	Parvatasana	AS14	85.360	14.045	15.549*
16	Paschimothanasana	AS15	90.676	19.360	22.141*
17	Ushtrasana	AS16	92.847	21.532	22.675*
18	Naukasana	AS17	93.622	22.306	28.658*
19	Vakrasana	AS18	87.658	16.342	22.020*
20	Viparitha Karni	AS19	91.189	19.874	25.563*
21	Sarvangasana	AS20	92.162	20.847	21.325*
22	Halasana	AS21	94.414	23.099	26.078*
23	Shirshasana	AS22	95.613	24.297	23.689*
24	Setu Bandasana	AS23	87.027	15.712	23.075*
25	Chakrasana	AS24	95.703	24.387	28.897*
26	Bhujangasana	AS25	86.486	15.171	20.589*
27	Shalabhasana	AS26	93.901	22.586	24.150*
28	Makarasana	AS27	73.225	1.910	4.215*
29	Dhanurasana	AS28	87.748	16.432	18.311*
30	Pavanamukthasana	AS29	88.577	17.261	18.618*
31	Shavasana	AS30	69.586	-1.730	-3.321*

\* Significant at 0.05 level with df (110) = 1.658

It is clear from both table – 1 that obtained value of 't' for all asanas in overall age group are higher (irrespective of the  $\pm$  value) than the tabulated value of 't' (1.658) at 0.05 level, that means there was a significant difference between the pre data and post data of HR. The negative (-ve) value of 't' for asanas AS30 indicates that HR was lower than the normal and positive (+ve) value of other asanas indicate that HR was higher than the normal.

**Table – 2**  
**TWO WAY ANALYSIS OF VARIANCE ON GAIN SCORE OF HEART RATE AND BREATHING**  
**FREQUENCY OF 30 ASANAS ON THREE AGE GROUPS**

	S. V	DF	SS	MSS	F- ratio	Tab - F
Heart Rate	Age	2	11176.775	5588.388	82.437*	3.00
	Asana	29	133172.806	4592.166	67.741*	1.47
	(age X asana)	58	4750.162	81.899	1.208	1.36

\*Significant at 0.05 level.

Table - 2 shows that calculated value of 'F' for row wise and column wise for HR were higher than the tabulated 'F' value, that means there was significant difference between the groups at 0.05 level and no significance difference was found in interaction wise. Further row wise and column wise LSD post hoc test was applied to check the mean difference, which is presented in the different tables from tables – 3 to table – 4.

**Table - 3**  
**AGE GROUP WISE MEAN DIFFERENCE ON GAIN SCORE OF HEART RATE**

HEART RATE		
Gr. I	Gr. II	Gr. III
18.137	17.433	13.947

LSD post hoc test value of CD is 0.685

From table - 3 it is concluded that significant difference was found in gain HR. Age groups I (20 years to 30 Years) showed a significantly highest gain and age group III (40 years and above) shows lowest gain in heart arte

**Table - 4**  
**ASANA WISE MEAN DIFFERENCE ON GAIN SCORE OF HEART RATE**

1- AS8		28.757	
2- AS24		24.387	
3- AS22		24.297	
4- AS21		23.099	
5- AS26		22.586	
6- AS17		22.306	2.081
7- AS16		21.532	
8- AS20		20.847	
9- AS13	2.045	20.541	
10- AS19		19.874	1.658
11- AS15		19.360	
12- AS4	0.694	19.180	
13- AS29		17.261	2.099
14- AS2		16.459	
15- AS28		16.432	
16- AS18		16.342	
17- AS7		16.162	
18- AS5		15.874	
19- AS23		15.712	
20- AS6		15.676	
21- AS25	2.090	15.171	1.288
22- AS14		14.045	
23- AS11		13.991	
24- AS12		13.901	0.144
25- AS3		11.270	
26- AS1		10.865	
27- AS9		9.892	
28- AS10		9.171	2.099
29- AS27		1.910	
30- AS30		-1.730	
LSD post hoc test value CD is 2.166			

**Note :-** Bracket indicate that there is no significant difference in the groups.

Table - 4 clearly indicates that AS8 had a significantly higher mean value of gain HR and significantly superior to all other 29 asanas. During the inverted asanas HR was also increased and no significant difference was found between AS24, AS22, AS21, AS26 and AS17. Shavasana (AS30) shows -ve value that means HR was lower than the normal.

## DISCUSSION OF FINDINGS

It was found in the study that gains HR of Gr. I was highest. The normal HR of all age group was normal and approximately same, but the average HR of different asanas was higher in Gr. I. Young subjects apply more effort and performed the asanas more perfectly than the elder subjects. This may increase the muscular tension, blood supply to the active muscles and return blood to the heart, which increase the heart rate.

It was concluded that AS8 has highest gain HR, in this asana complete body weight was lies on both hands, so muscular tension in hand was increased up to maximum. Active muscles require more supply of blood, to fulfill the requirement heart pumps more rapidly, which increase the HR.

It was also concluded from the study that inverted asanas had higher HR than the standing position, lie position and sitting position asanas. In inverted position, return blood to the heart was increased and heart pumps more blood against the gravity, which increase the HR.

During the AS30 HR was decrease whereas in the other 29 asanas HR was increased. This increased was maximum in AS8 and lowest in AS27. Both AS30 & AS27 were relaxing asanas. In AS30 subject feel more relax and comfort in compare to AS27.

## CONCLUSION

During the final position of every asanas HR (except in AS30) was increased. AS8 and AS29 are considered as the most difficult asanas for increase in HR. The present study had found that some of the asanas which can give high increase in the HR. As asanas are perform by many peoples and in all age groups. It is suggested that people who are having cardiac and breathing problem must aware about those asanas, which can give a high increase in their heart rate and breathing frequency. They should also use expert guidance and must consult their doctor before performing any difficult asanas.

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