

ALTERNATE NOSTRIL YOGA BREATHING (ANYB)

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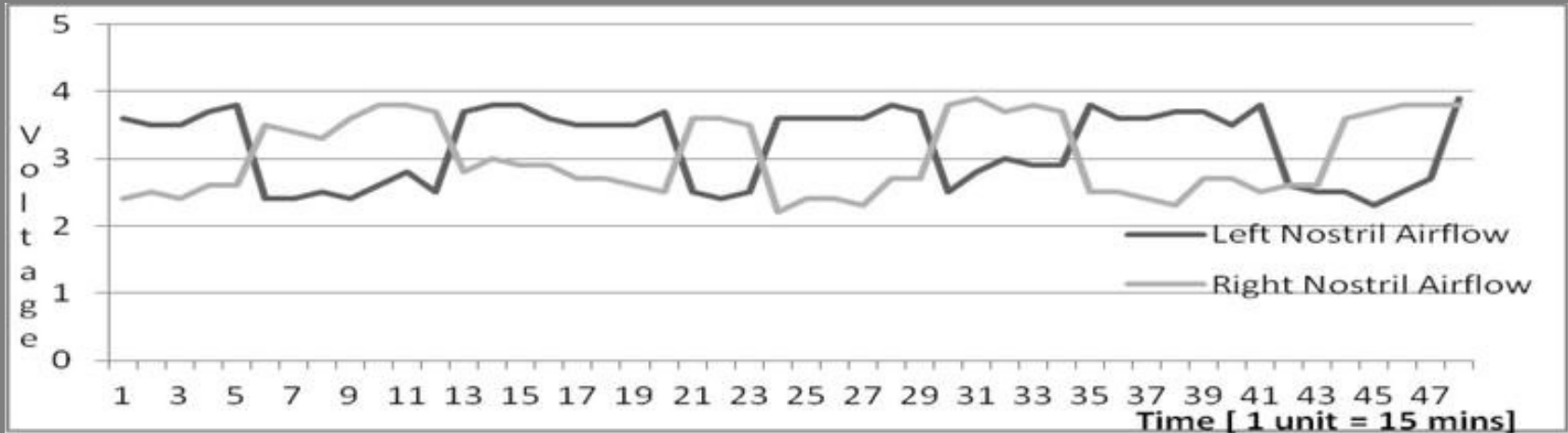
Director, Patanjali Research Foundation,

www.patanjaliresearchfoundation.com

Haridwar, India



THE NASAL CYCLE



The nasal cycle is the spontaneous congestion and decongestion of the nasal mucosa during the day, where congestion of one side is accompanied by reciprocal decongestion of the contralateral side. This usually occurs every 4-8 hours.

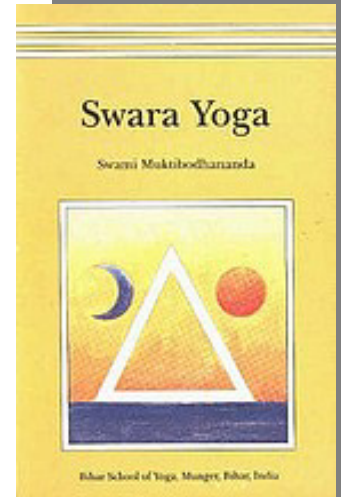
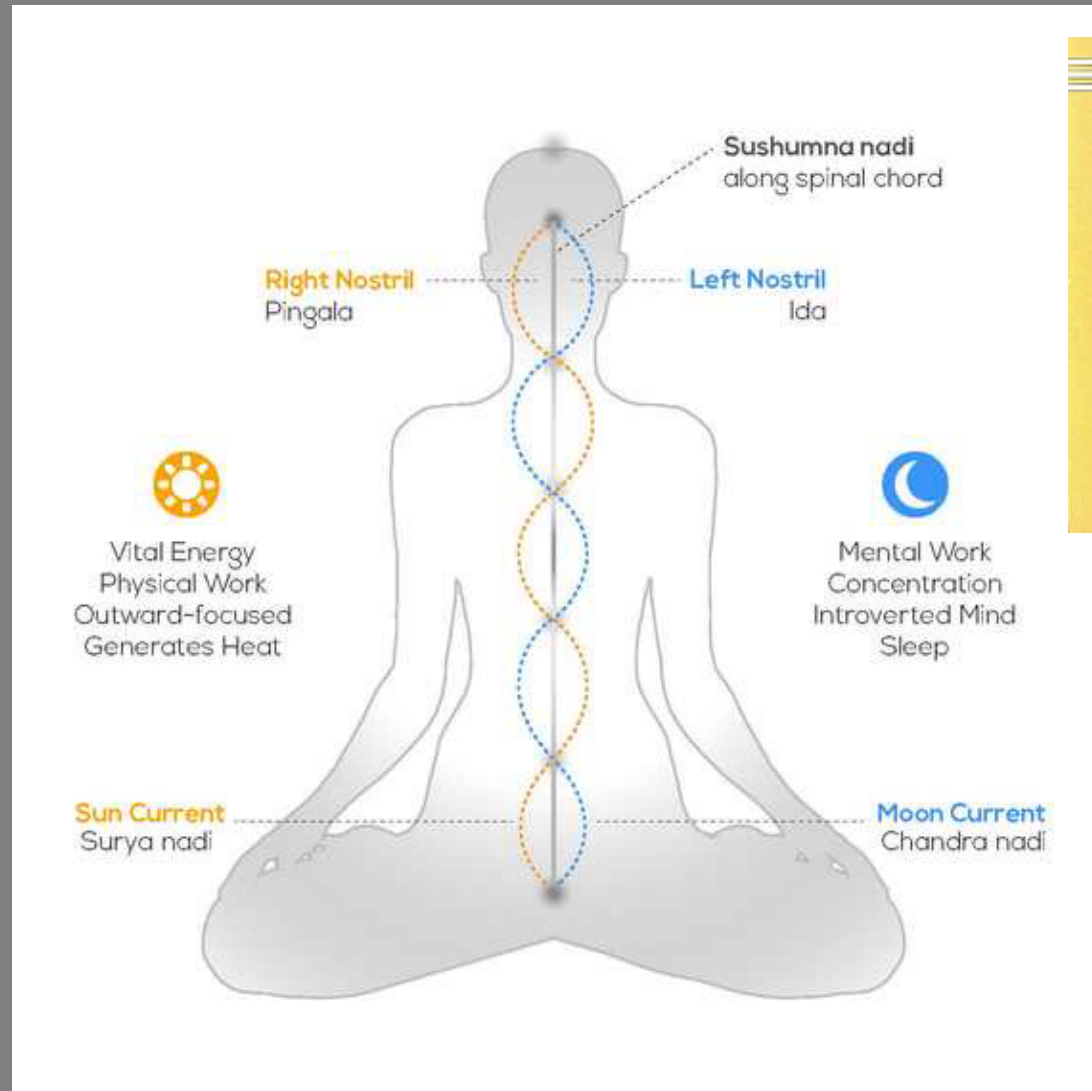
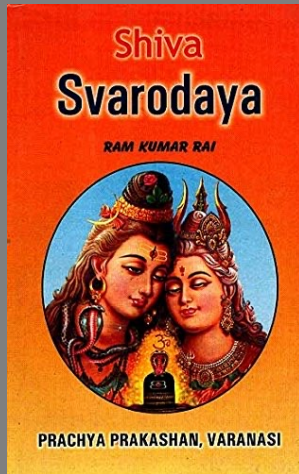
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-INSIGHTS FROM YOGA TEXTS ABOUT

**WHAT IS THE EFFECT OF
LATERALIZED RIGHT OR LEFT
NOSTRIL AIRFLOW AT REST?**

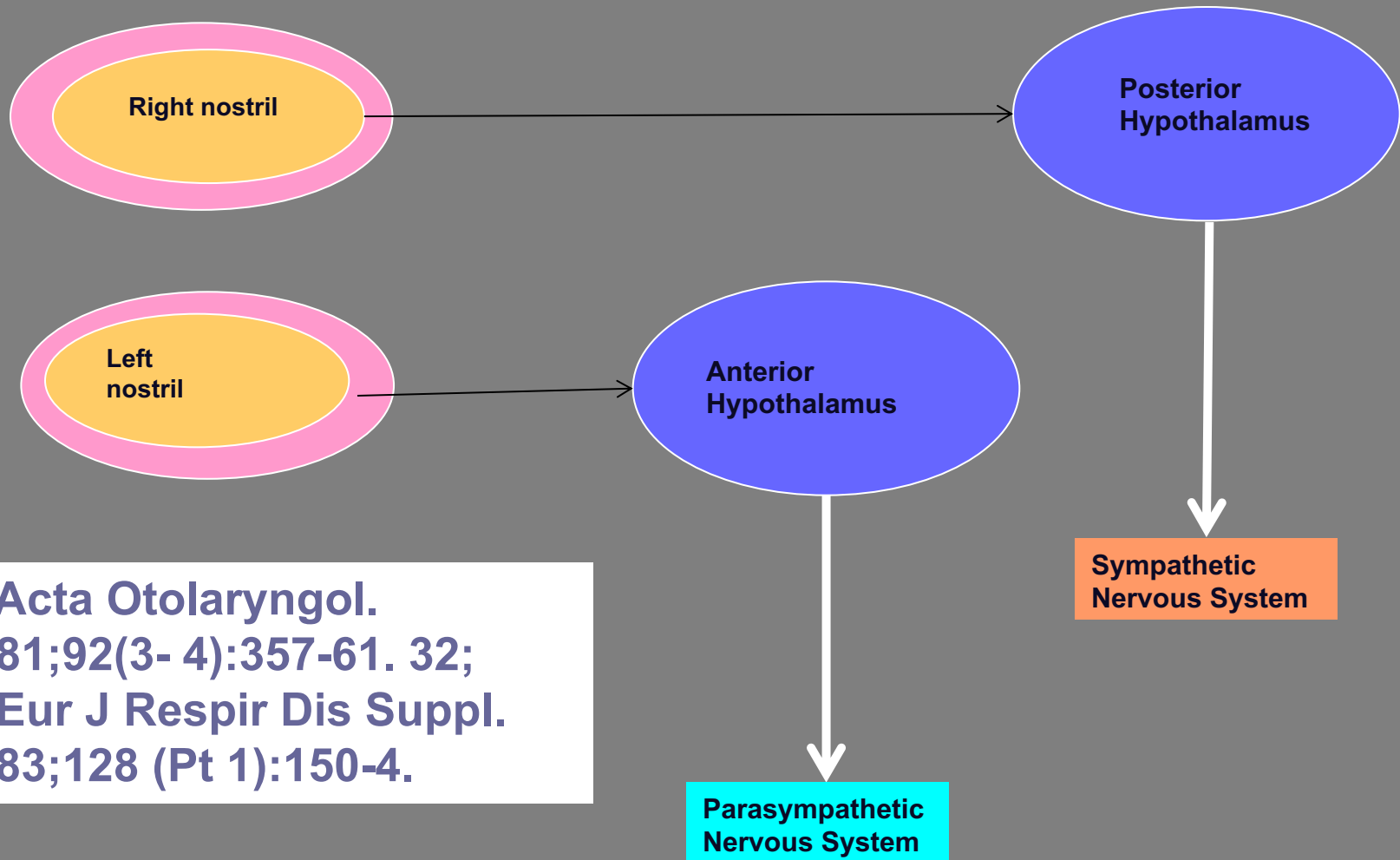


CONCEPTS FROM YOGA





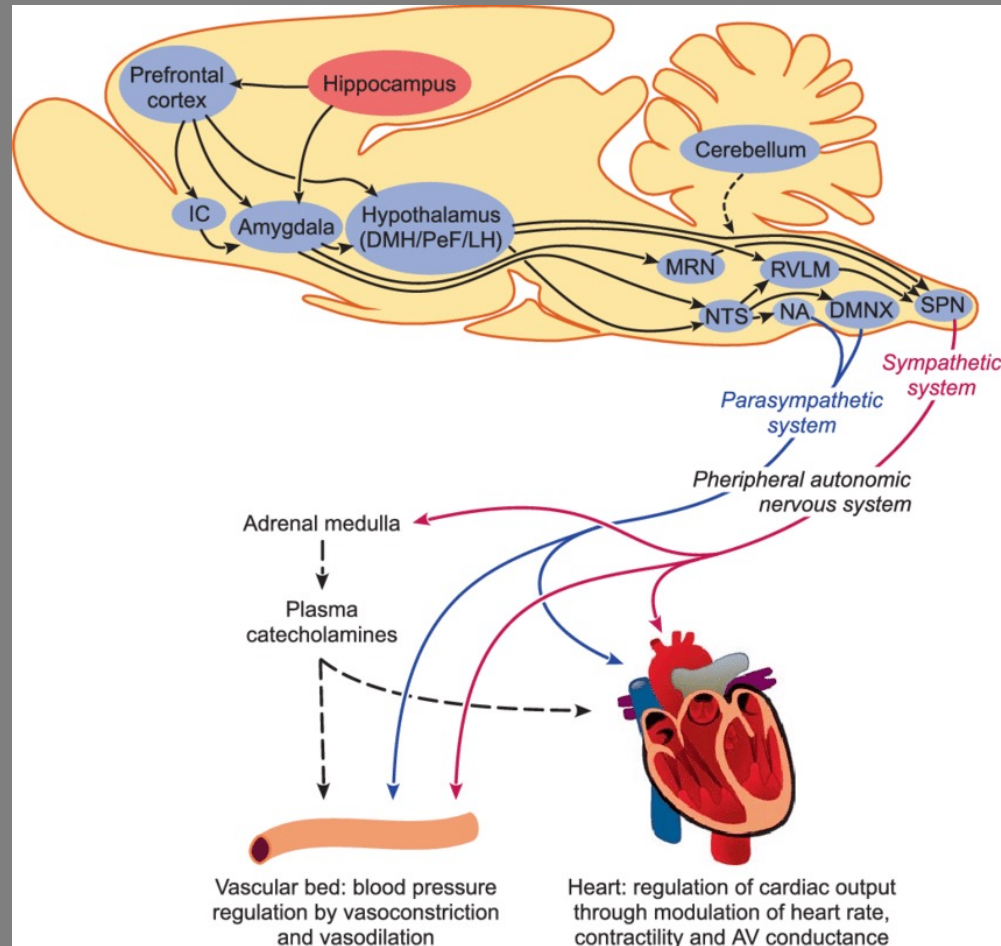
WHY DO RIGHT AND LEFT NOSTRIL BREATHING HAVE DIFFERENT EFFECTS?



1. Acta Otolaryngol. 1981;92(3- 4):357-61. 32;
2. Eur J Respir Dis Suppl. 1983;128 (Pt 1):150-4.



PATHWAYS THAT LINKS DIFFERENT NUCLEI OF BRAIN WITH CARDIOVASCULAR SYSTEM VIA AUTONOMIC INNERVATIONS

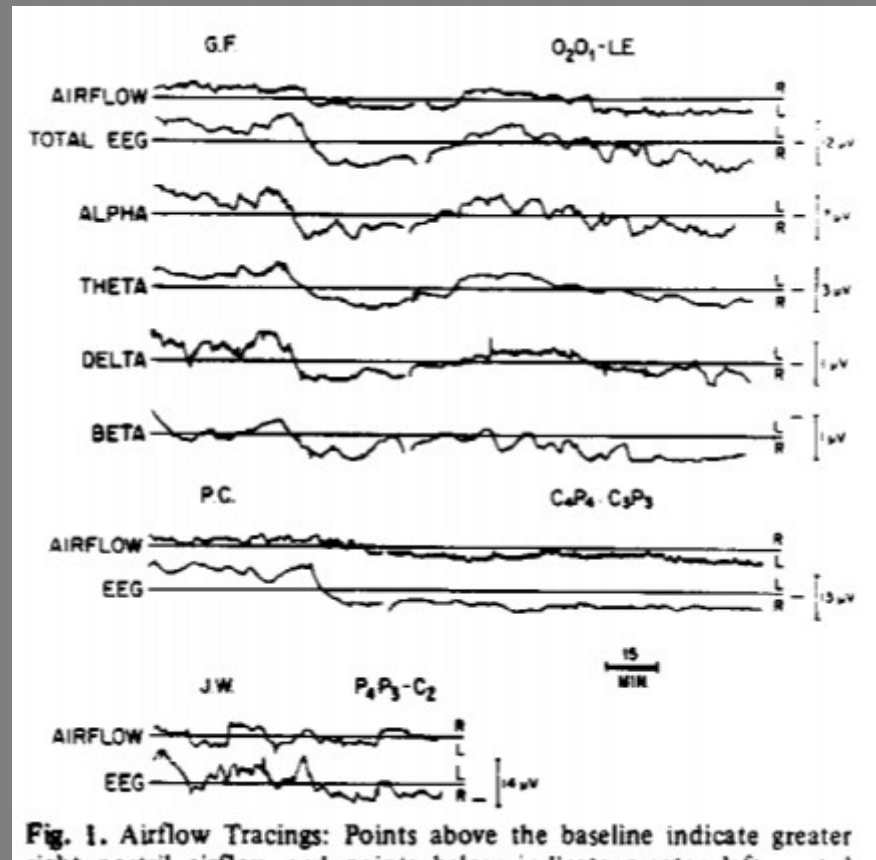


PRANAYAMA – Use of our will to direct the airflow through one or both nostrils or alternately

**WHY DO RIGHT AND LEFT NOSTRIL
BREATHING HAVE DIFFERENT
EFFECTS?**



UNILATERAL NOSTRIL BREATHING - CONTRALATERAL OR IPSILATERAL EEG EFFECTS?

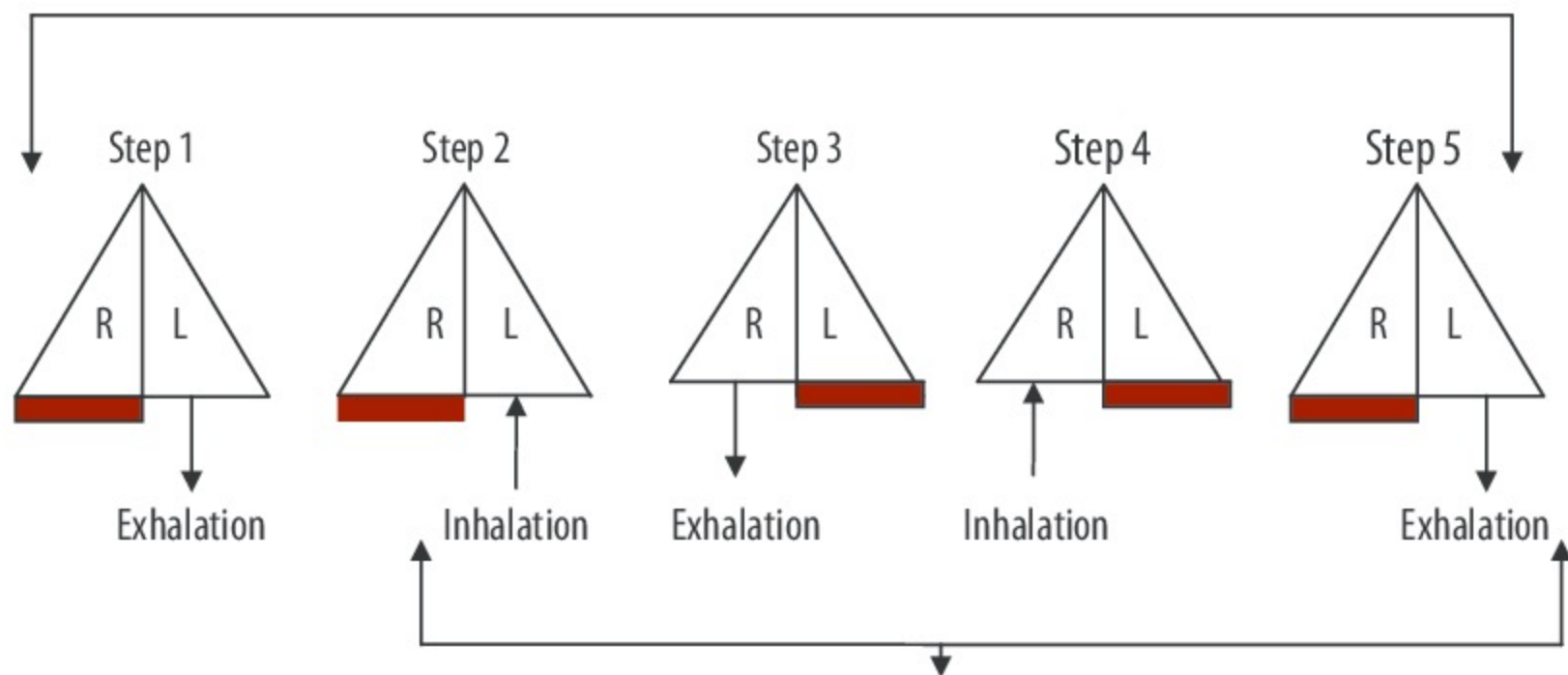


**EEG signatures
(Dominant,
Non dominant nostril)**

Scientific Reports, 2022

**Research in Bangalore
(NIMHANS, SVYASA);
Now: Patanjali Research Foundation,
Haridwar, north India**

One complete cycle of alternate nostril yoga breathing



After completing first cycle the next cycle begins with Step 2

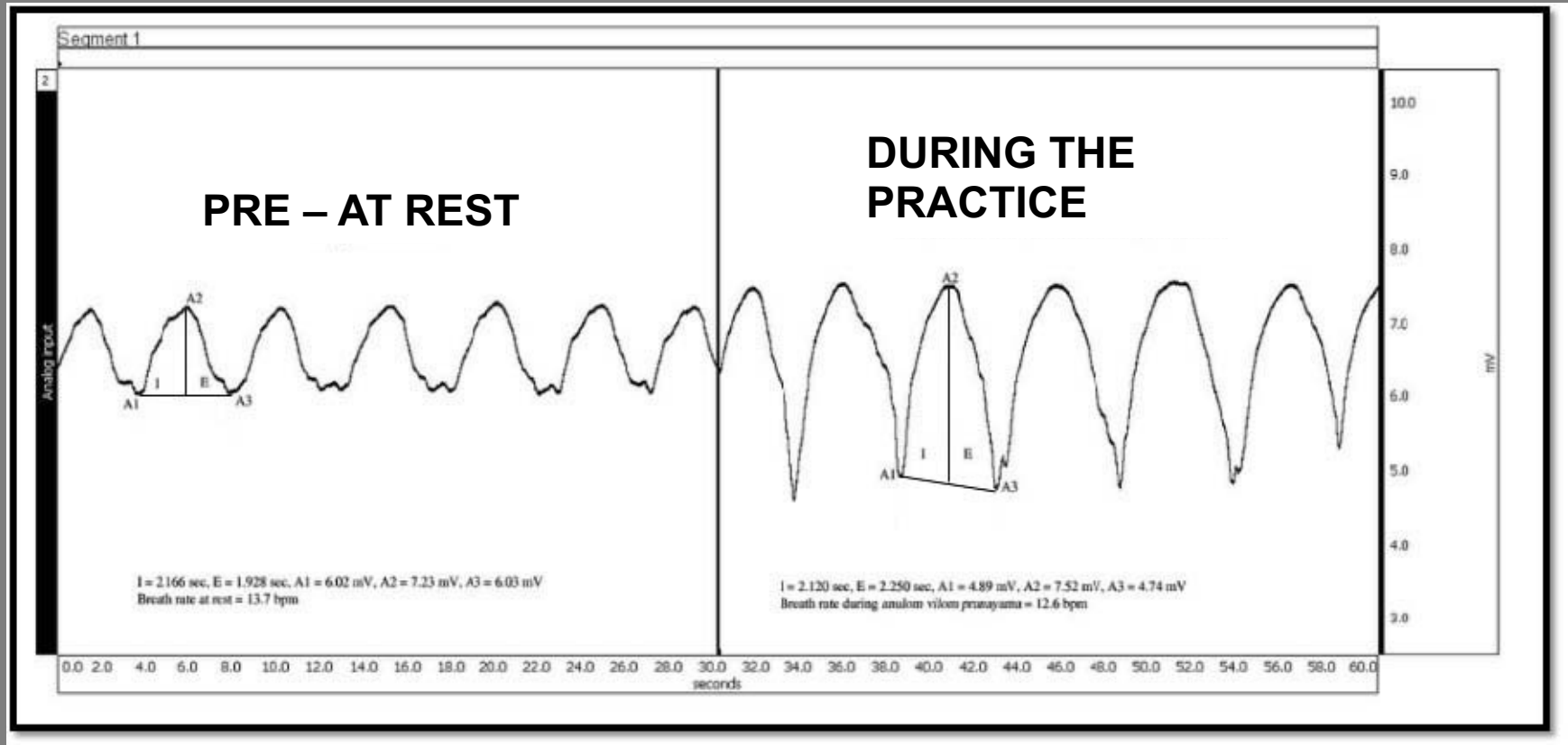
R = Right nostril;

L = Left nostril;

 Nostril occluded using thumb/ring finger of the right hand



Alternate nostril yoga breathing = *Anulom-vilom pranayama*



Breath rate during *anulom-vilom* < breath rate at rest
Inspiratory duration:Expiratory duration during *anulom-vilom* =
1 : 1.1

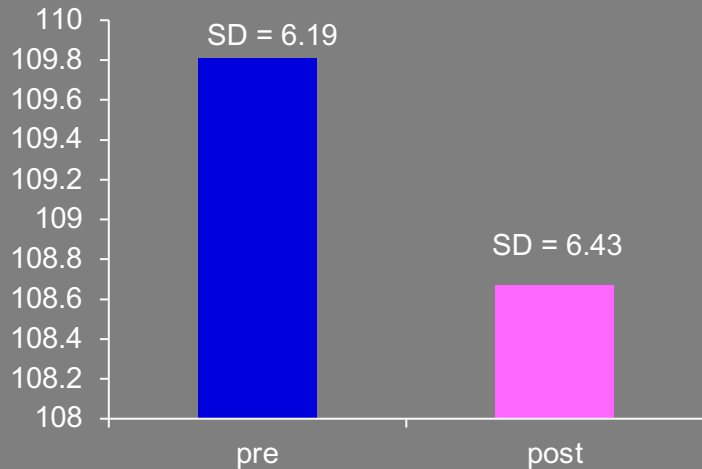
Alternate nostril breathing and:

- 1. Blood pressure**
- 2. Heart rate variability**
- 3. EEG**
- 4. Event related potentials**
- 5. A performance task for attention**
- 6. State anxiety**

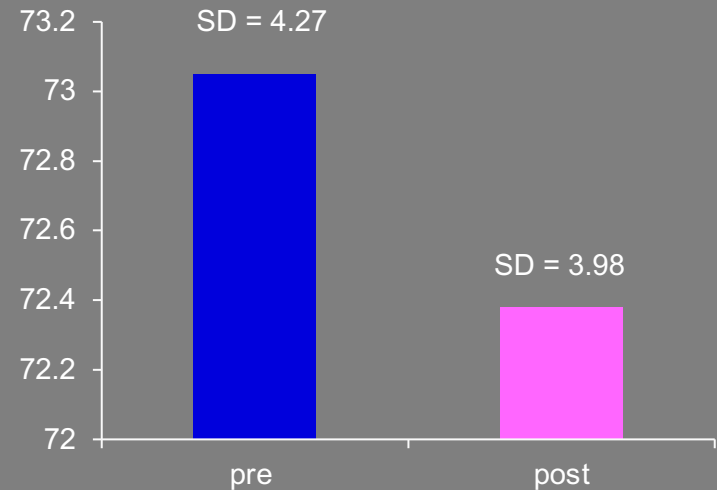
BLOOD PRESSURE



BP and alternate nostril breathing (ANYB) in normotensives



**Systolic blood pressure
decreased after ANYB**

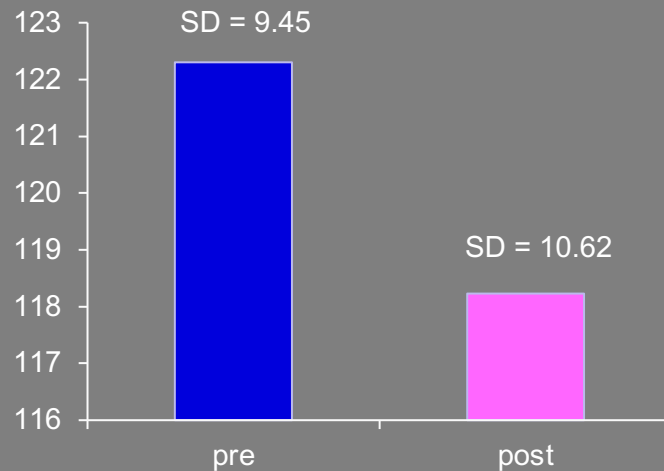


**Diastolic blood pressure
decreased after ANYB**

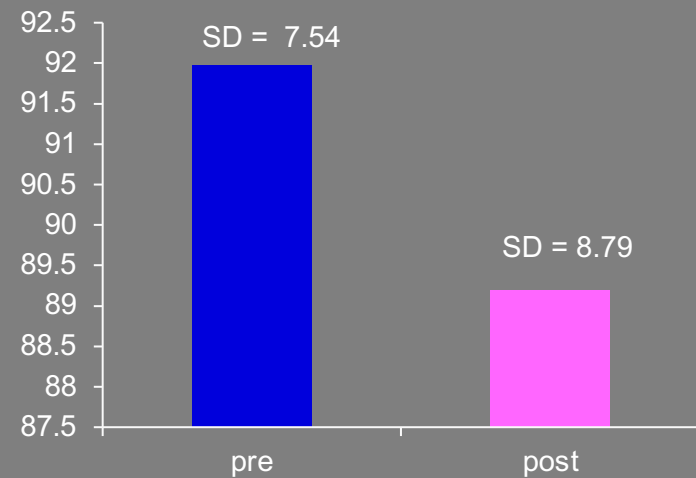


Non-invasive BP: Systolic blood pressure and mean arterial pressure after ANYB in normotensives

**IMPORTANT: Practice
5-1-5-1-5**



**Systolic blood pressure
decreased after ANYB**



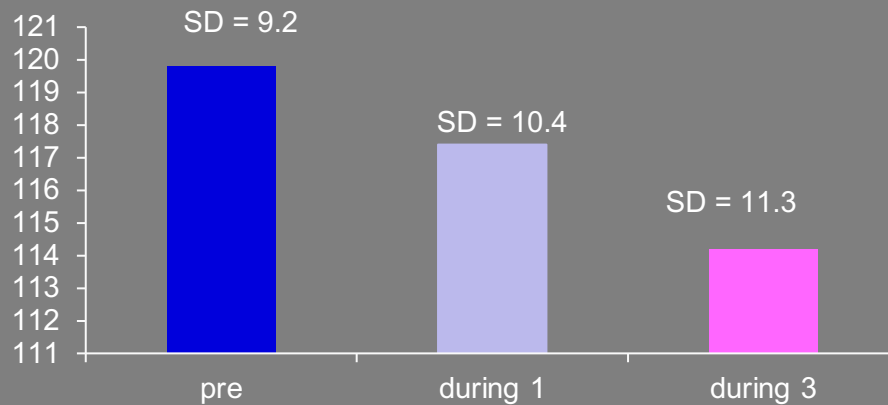
**Arterial mean pressure
decreased after ANYB**



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Non-invasive BP during alternate nostril breathing in normotensives

Systolic blood pressure decreased during ANYB



TWO POINTS

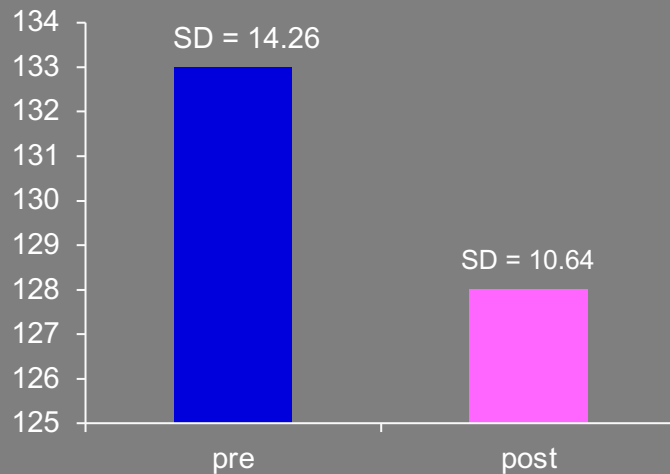
1. NIBP vs. BP
2. During 3 vs. During1
3. **IMPORTANT: Practice 5-1-5-1-5**

Medical Science Monitor Basic Research., 2014

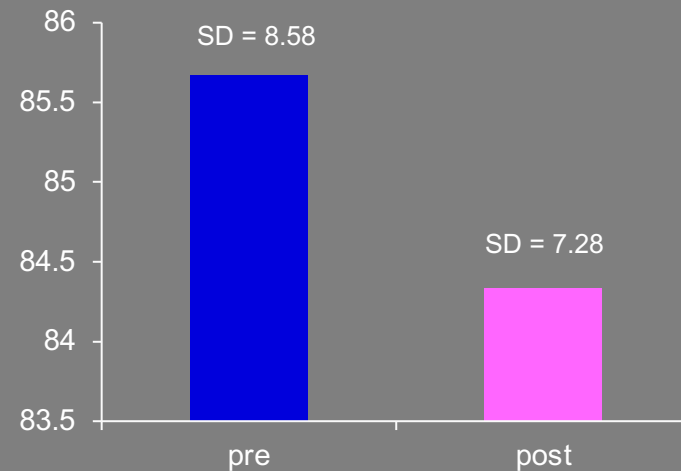


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Non-invasive BP and ANYB in hypertensives

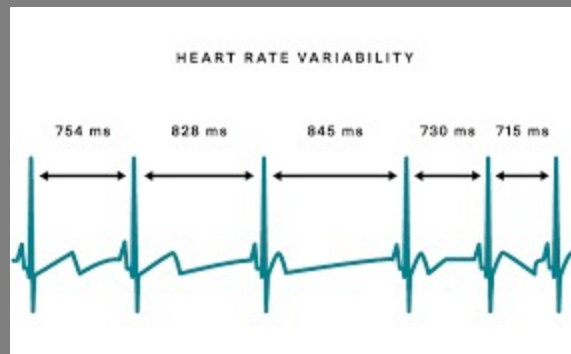


Systolic blood pressure decreased following 10 min of ANYB



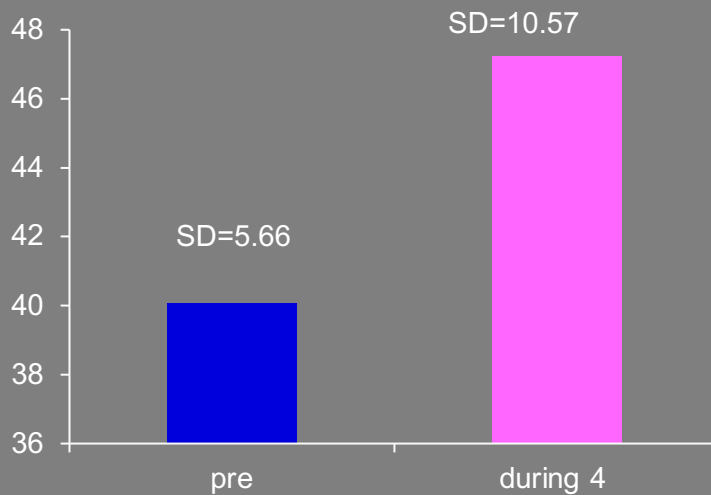
Diastolic blood pressure decreased following 10 min of ANYB

HEART RATE VARIABILITY

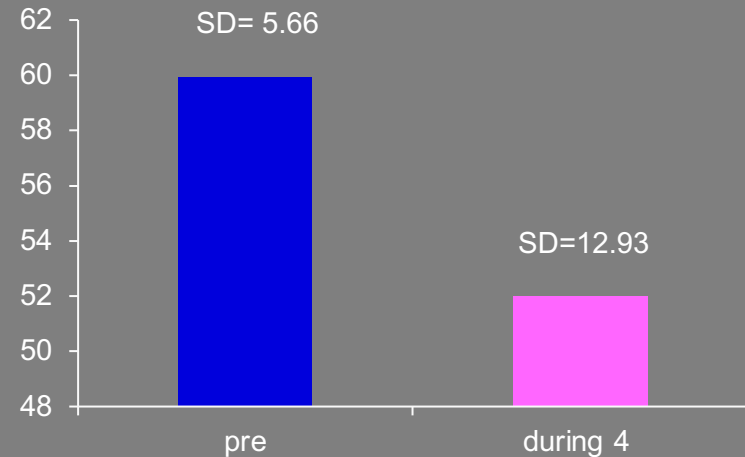




Frequency domain indices of Heart rate variability (HRV) during alternate nostril yoga breathing (ANYB)



LF power increased during ANYB



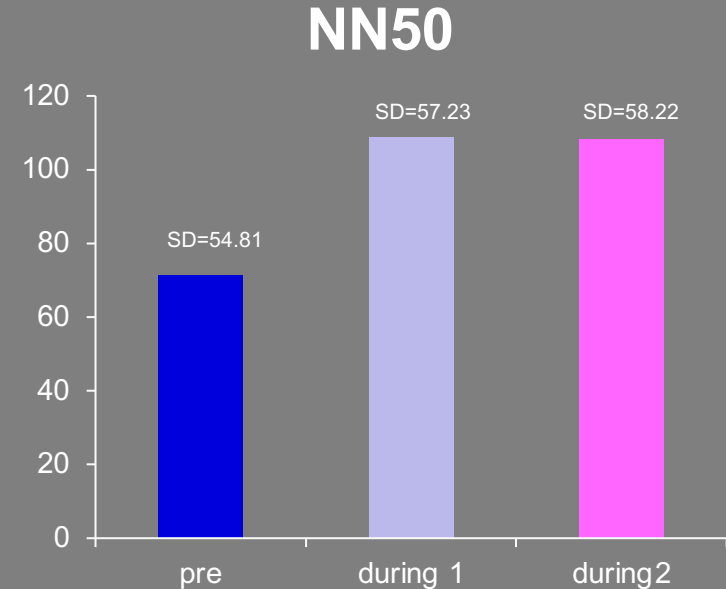
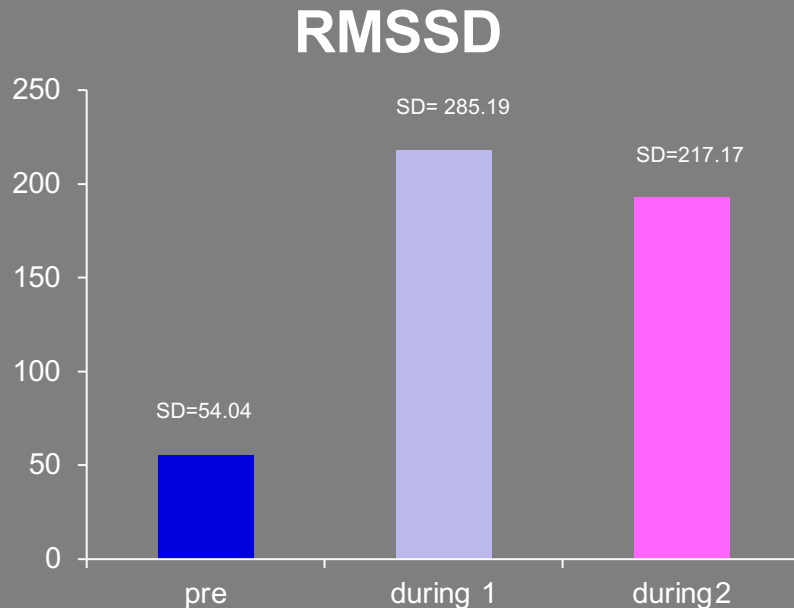
HF power decreased during ANYB

Decreased cardiac parasympathetic; decreased BP

Applied Psychophysiology Biofeedback., 2008



Time domain indices of Heart rate variability (HRV) during alternate nostril yoga breathing (ANYB)



RMSSD and NN50 were increased during ANYB

INCREASED PARASYMPATHETIC – WHY?
IMPORTANCE OF GAPS BETWEEN PRACTICE



Continued...

Frequency and Time domain indices of Heart rate variability (HRV) following alternate nostril yoga breathing & 3 other *pranayamas*

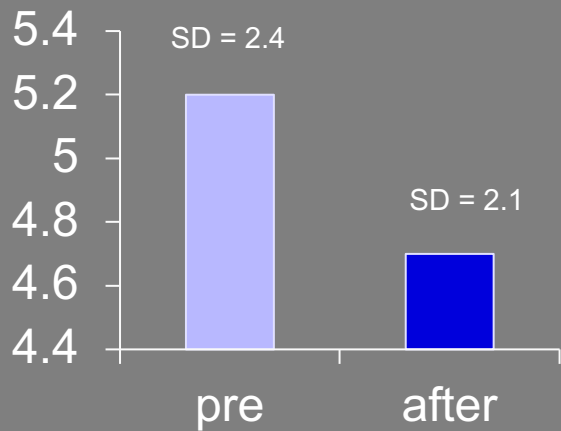
No changes were found in HRV indices indicative of sympathetic activity following ANYB while performing a complex attention task

Clinical EEG and Neuroscience., 2022

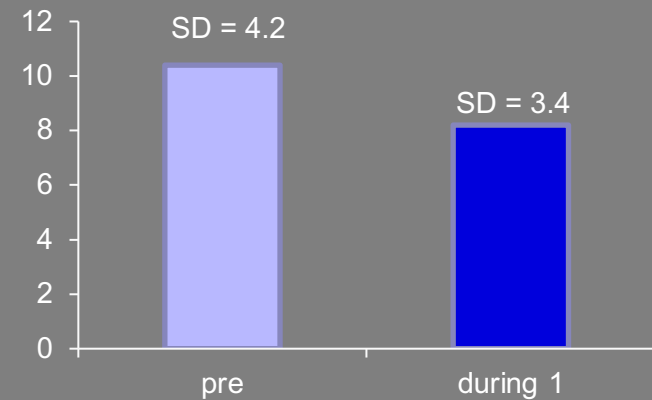
EEG



EEG and alternate nostril yoga breathing



Decrease in beta amplitude following ANYB



Decrease in theta power during ANYB

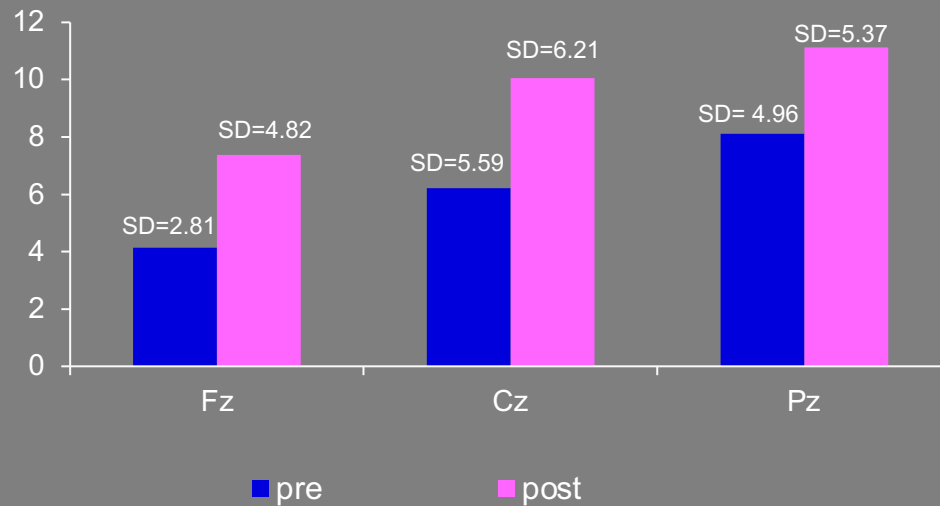
BMC Research Notes, 2017

EVENT RELATED POTENTIALS

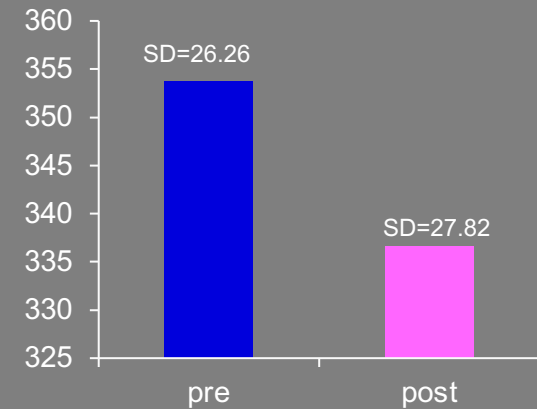




P300 and alternate nostril yoga breathing



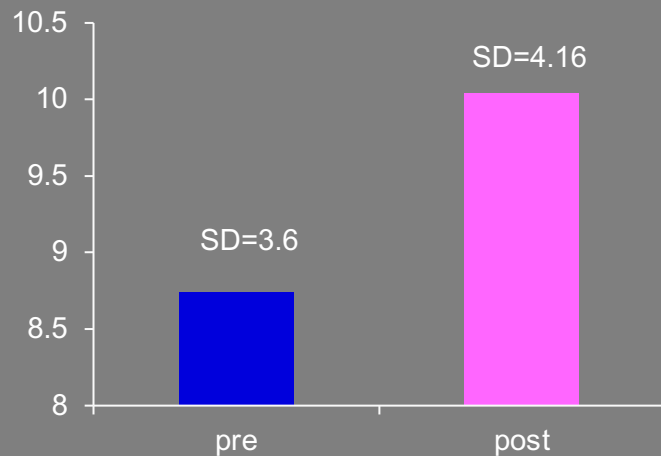
Peak amplitude increased following ANYB at Fz, Cz and Pz sites



Peak latency decreased following ANYB at Fz site



P300, alternate nostril yoga breathing and three other *pranayamas*

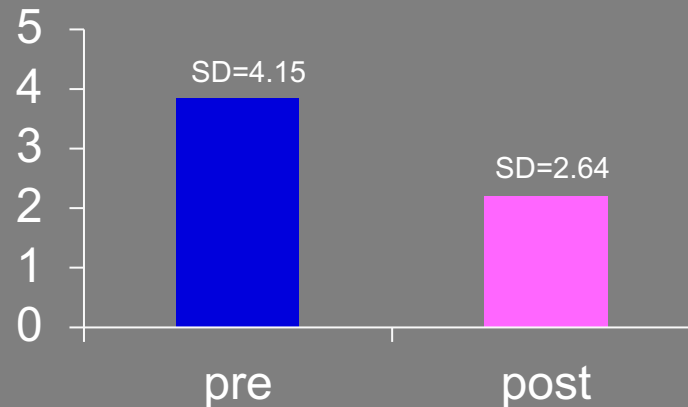


Peak amplitude of P300 wave increased following ANYB at Pz site

MENTAL STATE



Attention in a performance task and alternate nostril yoga breathing – and high frequency yoga breathing



Fewer errors following ANYB in the SLCT
scores; No change in absolute scores

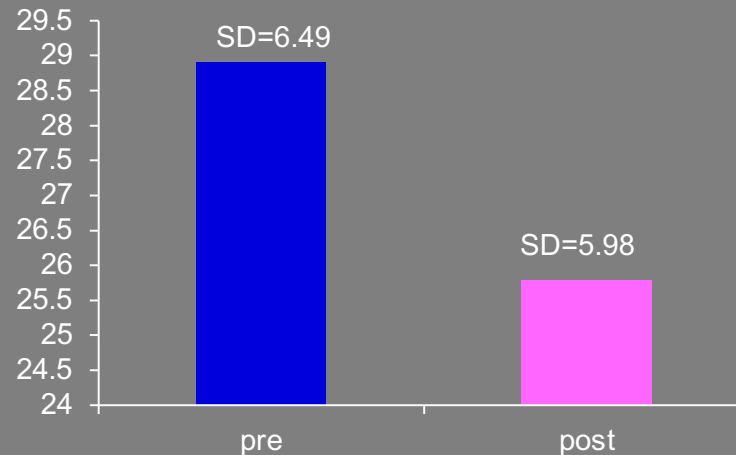
Perceptual and Motor Skills., 2007

Complementary Medicine Research., 2021



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State anxiety and alternate nostril yoga breathing and three other *pranayamas*



State Anxiety decreased following ANYB

Complementary Medicine Research., 2021



Sn.	Yoga Breathing Technique	State anxiety (% change)
1	Alternate nostril yoga breathing	-10.76%*
2	Bumblebee yoga breathing	-9.91%*
3	Bellows yoga breathing	-8.15%*
4	High-frequency yoga breathing	-6.20%*
5	Breath awareness	NS
6	Quiet seated rest	NS

*** = Statistical significance, General linear mixed model, *post hoc* analysis
(Complementary Med Res, 2021)**



WHY DO RIGHT AND LEFT NOSTRIL BREATHING HAVE DIFFERENT EFFECTS?