



THE IMMEDIATE EFFECT OF TRATAKA ON EXECUTIVE FUNCTIONS AMONG ADULTS

Arvind Kumai*	Research scholar, MSc (Yoga) *Corresponding Author
Dr. Vijayakumar PS	Associate Professor, BAMS, MD (Yoga & Rehab.), MSC (Psychology), Ph.D. (Yoga)
Sahana AU	Clinical Psychologist MSC (Clinical psychology) Department of Ashtanga yoga

ABSTRACT **Background:** There is evidence to suggest that lack of physical activity, a common experience among adults, can negatively impact executive functions such as attention, memory, and decision making. Trataka can improve eye deformity, executive ability, willpower, and relaxation. Trataka may also have a protective effect on the brain, reducing inflammation and the risk of neurodegenerative diseases. **Aim of the study:** The immediate effect of Trataka on executive function among adults. **Material & methods:** Forty healthy Adults to observe the immediate effects of thirty minute trataka regimen for one day. Participants were recruited through convenient sampling and were between the ages of 18-40. The study used a single group pre-post design. **Results:** After single trataka session showed that 11.59% significant increase ($P < 0.05$) in total attempted score on DLST. Similarly, there was 11.48% significant increase ($P = 0.05$), and there was 16.6% increase in ($P > 0.05$) in wrong attempt scores. After single trataka session it showed that 22.48% significant increase ($P < 0.01$) in total attempted score on SLCT. Similarly, there was 22.71% significant increase ($P = 0.01$) in NS. However, there was 70.58% reduction in wrong attempt score which was highly significant ($P = 0.001$). **Conclusion:** the available evidence suggests that the practice of single session trataka has a positive on executive function among adults.

KEYWORDS : Trataka, Adults, executive functions,

INTRODUCTION

To comprehend everyday routine activities, executive function is necessary. In recent decades, two hundred million children globally failed to reach their maximum potential in executive development because of interrelated factors like poverty, lack of care, and poor immunity (S. Grantham-McGregor et al., 2007) and this types of adverse childhood events have a negative effect on later-life executive performance (K. Ritchie et al., 2011).

Aging is the most common cause of executive decline which is caused by pathology: such as neurocognitive disorder which is the beginning of cognitive decline (Borland, E et al., 2020). It affects the performance of executive tasks that require one's to process quickly or transform information to make a decision, including measures of speed of processing, working memory, and executive cognitive function (Murman DL;2015). According to World Health Organization estimated that the world's population aged above 60 years will increase from 12% to 22% between 2015 and 2050.

Some evidence suggests that physical activity plays a key role in healthy ageing as well as both physical body and executive function. Yoga is commonly used as a form of practice that combines physical postures with breathing sequence and meditation that targets specific parts for senior citizens, such as balancing, strengthening, and flexibility. It is hypothesised that yoga improves brain function such as executive function which involves perception, memory, learning, attention, decision making, and language abilities. (Hoy, S. et al., 2021). Stress is unavoidable in the present era. There are researches that stress during early days of life such as abuse and neglect can develop mental problems such as anxiety, depression, substance abuse and less ability to cope with daily life stress which directly influences learning and memory function. "Prevention is better than cure" yoga and meditation work at multiple levels such as decrease cortisol level, stimulate brain and increase cerebral blood flow which help in synaptogenesis and neurogenesis which maintain brain construct, increase in mood neurotransmitter (Aggarwal, A.,2020). Because of neuron degeneration there is a huge fluctuation in executive function and there is no study has looked at the immediate effect of Trāaka, on executive function among adults therefore, in this study we attempted to use Trāaka in adults. The aim of the study was to evaluate the Immediate Effect of Trāaka on executive functions among adults.

MATERIAL & METHODS

Forty university students have been given 30 minute trataka session. Its immediate effects have been observed. In previous discussions, the potential risks and benefits of the study have been thoroughly elucidated. Participants provided written informed consent. This study

was conducted at Lakulish Yoga University, located in Ahmedabad, Gujarat, India. Healthy university students of both the gender age ranging from 18 to 40 were recruited for this study. Subjects were recruitment using a convenient sampling method and a single group pre-post design was employed.

Intervention

The procedure used for Trāaka session was adapted from the book 'Yogā for promotion of positive health' (Nagendra HR & Nagrathana R;2001).

SN	NAME OF PRACTICE	DURATION
1.	Starting prayer	1 min.
2.	Preparatory eye exercise	9 mins.
	Up and Down movement – 10 rounds	30 secs.
	Simple palming	1 min.
	Right and Left movement – 10rounds	30 secs.
	Simple palming	1 min.
	Eye movement, right -up-left-down-10 rounds	30secs.
	Press and release palming	1 min.
	Eye movement: left-up-right-down-10 rounds	30 secs.
	Press and release palming	1 min.
	Clockwise eye movement-10 rounds	30 secs.
	Constant pressure palming	1 min.
	Anti-clockwise eye movement-10 rounds	30 secs.
	Constant pressure palming	1 min.
3.	Jyoti Trataka	
	Effortless Gazing	4 mins.
	'A' kara chanting	1 min.
	Intensive focusing	4 mins.
	'U' kara chanting	1 min.
	Break	1 min.
	De-focusing	4 mins.
	Bahramari	1 min.
	Silence	4 mins.
	Closing prayer	1 min.

Outcome Measures

Two tools were used to assess the outcome of the intervention.

1. Six-letter cancellation test (SLCT)
2. Digit letter substitution test (DLST)

Digit letter substitution test (DLST)

The DLST worksheet has 8 rows and 12 columns of randomly chosen 1–9 numbers. The DLST worksheet measures mental flexibility, visual scanning, attentiveness, and psychomotor speed of information processing. Indians utilise it with the same kind of design

(Natu.et.al;1997).

2) Six letter cancellation test (SLCT)

The worksheet for the six-letter cancellation exercise has random alphabets from A to Z arranged in 14 rows and 22 columns. The DLST worksheet measures mental flexibility, visual scanning, attentiveness, and psychomotor speed of information processing. The six-letter cancellation test has been used to the Indian people in a similar sort of design (Natu.et.al;1997).

RESULTS

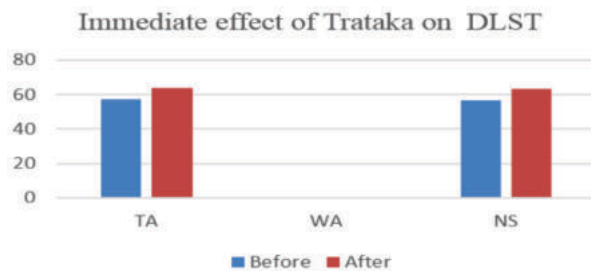
DLST: Digit letter substitution test

Immediate effect of single session Tratak session it showed that 11.59% significant increase (P< 0.05) in total attempted score on DLST. Similarly, there was 11.48% significant increase (P= 0.05). and there was 16.6% increase in (P> 0.05) in wrong attempt scores [Table 1].

Table-1 : DLST Changes after practice

DLST scores	Changes after		% change	P-value
	Before	After		
Total attempt	57.35± 11.88	64 ±11.61	11.59%	0.05*
Wrong attempt	0.3 ±1.4	0.35 ±0.9	16.6%	0.1
Net score	57.05 ±12.13	63.6 ±11.61	11.48%	0.05*

*significant at P<0.05, ** significant at P<0.01, ***significant at P<0.00 (paired sample test and Wilcoxon Signed Ranks Test)



Graph-1: DLST Changes after practice

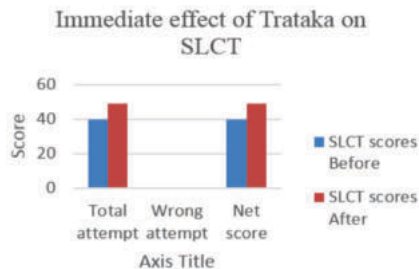
SLCT: Six Letter Cancellation Task

Immediate effect of single session trataka session it showed that 22.48% significant increase (P< 0.01) in total attempted score on SLCT. Similarly, there was 22.71% significant increase (P = 0.01) in NS. However, there was 70.58% reduction in wrong attempt score which was highly significant (P= 0.001) [Table 2].

Table-2: SLCT Changes after practice

SLCT scores	Changes		% change	P-value
	Before	After		
Total attempt	40.02 ±13.5	49.02 ±13.16	22.48%	0.01*
Wrong attempt	0.17 ±0.49	0.05 ±0.21	70.58%	0.000**
Net score	39.85 ±13.58	48.9 ±13.11	22.71%	0.01**

*significant at P<0.05, ** significant at P<0.01, ***significant at P<0.00 (paired sample test and Wilcoxon Signed Ranks Test)



Graph-2: SLCT changes

DISCUSSION

Tartaka is one of the yoga-based techniques which come under the part of shatkriya that uses an object to focus concentration to generate resonance, which is used to induce deep relaxation starting prayer for mind and body. The visuals we see are created by the brain from the signals. Then in the occipital lobe (the visual processing area of the brain) associated with visuo spatial processing, distance and depth

perception, colour determination, object and face recognition, and memory formation.(Rehman & Yasir Al Khalili.,2022) The limbic system is intricately linked with the parietal, temporal, and occipital lobes, as well as the hippocampus in particular.. Positive emotions can motivate individuals to expand their attention, focus, cognitive flexibility, and mental representations. (Dahl. et al.; 2015).

CONCLUSION

In the Journal of Ayurveda and Integrative Medicine found that trataka improved attention and memory among healthy young adults. Trataka, a yogic technique that involves gazing at a particular point or object, has been shown to improve executive function among adults, but more research is needed to understand its mechanisms and determine its long-term benefits.

REFERENCES.

- 1 Aggarwal, A. (2020). Hypothalamo-Pituitary-Adrenal axis and Brain during Stress, Yoga and Meditation. *International Journal of Health and Clinical Research*, 3(9), 96-103.
- 2 Borland, E., Stomrud, E., van Westen, D., Hansson, O., & Palmqvist, S. (2020). The age-related effect on cognitive performance in cognitively healthy elderly is mainly caused by underlying AD pathology or cerebrovascular lesions: implications for cutoffs regarding cognitive impairment. *Alzheimer's research & therapy*, 12(1), 1-10.
- 3 Greenfield EA, Moorman SM. Childhood Socioeconomic Status and Later Life Cognition: Evidence from the Wisconsin Longitudinal Study. *J Aging Health*. 2019 Oct;31.
- 4 Hoy, S., Östh, J., Pascoe, M., Kandola, A., & Hallgren, M. (2021). Effects of yoga-based interventions on cognitive function in healthy older adults: A systematic review of randomized controlled trials. *Complementary therapies in medicine*, 58, 102690.
- 5 K. Ritchie, I. Jaussett, R. Stewart, et al. Adverse childhood environment and late-life cognitive functioning *Int J Geriatr Psychiatry*, 26 (2011).
- 6 Murman DL. The Impact of Age on Cognition. *Semin Hear*. 2015 Aug;36(3):111-21. doi: 10.1055/s-0035-1555115. PMID: 27516712; PMCID: PMC4906299.
- 7 Nagendra HR, Nagrathana R. Promotion of Positive Health. Bangalore: Swami Vivekananda Yoga Prakashana; 2001. randomised controlled trials. *Complementary Therapies in Medicine*, 58, 102690.
- 8 S. Grantham-McGregor, Y.B. Cheung, S. Cueto, P. Glewwe, L. Richter, B. Strupp Developmental potential in the first 5 years for children in developing countries.*Lancet*, 369 (2007).
- 9 Natu, MV., Agarawal, AK. (1997). Testing of stimulant effects of coffee on the psychomotor performance: an exercise in clinical pharmacology. *Indian Journal of Pharmacology*, 29(1), 11–14.
- 10 Talivadkar, S., Jagannathan, A., & Raghuram, N. (2014). Effect of trataka on cognitive functions in the elderly. *International journal of yoga*, 7(2), 96.
- 11 Rehman, A., & Al Khalili, Y. (2022). Neuroanatomy, occipital lobe.
- 12 Dahl, C. J., Lutz, A., & Davidson, R. J. (2015). Reconstructing and deconstructing the self: cognitive mechanisms in meditation practice. *Trends in cognitive sciences*, 19(9), 515-523.