International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

ISSN:2347-6567

IJAMSCR |Volume 9 | Issue 2 | Apr - Jun - 2021
www.ijamscr.com

Research Study *Medical research*

Short term effects of Suryanamaskar on Reaction time in Physiotherapy students

Pankhuri Vairagade[1], Dr. Geeta Bhatt[2]

[1]*MPT K.J Somaiya College of Physiotherapy, Mumbai, Maharashtra, India.*
[2]*HOD Neurophysiotherapy, K.J Somaiya College of Physiotherapy, Mumbai, Maharashtra, India.*

***Corresponding Author: Pankhuri Vairagade**
Email ID: pankhurivairagade02@gmail.com

ABSTRACT

Background: Reaction time is very important for our everyday lives and needs intact sensory system, cognitive processing and motor performance. Yoga has shown significant results in decreasing Reaction time. Hence, this study was carried out to find out the short-term effects of Suryanamaskar on Reaction time in Physiotherapy students.

Method: This study was an experimental study performed on 42 female volunteers (21 in each group) for 2 weeks between the age group of 19-25 years. 21 subjects in the control group were given 5 minutes of breathing exercises and 21 subjects in the experimental group performed Suryanamaskarfor 2 weeks. Reaction time was measured in both the groups using Deary Liewald Reaction time task software pre and post 2 weeks intervention. Reaction time was measured again at the end of 3rd and 4th week to find out the carryover effects.

Results: The Suryanamaskar group showed significant difference when compared to the control group (p value <0.001) There was a significant difference seen in the pre and post readings of Suryanamaskar group (p value<0.001)

Conclusion: Suryanamaskar produced significant shortening of Reaction time in physiotherapy students and can be beneficial in improving reaction time as an effective means to improve neuromuscular abilities.

Keywords: Reaction time, Suryanamaskar, Yoga.

INTRODUCTION

Reaction time is one of the most important components of motor movements. It is a purposeful voluntary response to external stimulus. The time taken between application of the stimulus and its appropriate voluntary response is called the reaction time.[1] Reaction time is a simple and non-invasive test for central as well as peripheral neural structures.[2] It is expressed in milliseconds. It is a method to study one's central information processing speed and fast co-ordinated peripheral movement response.

Reaction time is very important for our everyday lives and needs intact sensory system, cognitive processing and motor performance. Physiotherapists are specialised health care workers in the field of musculoskeletal, neuromuscular, cardio respiratory and community-based rehabilitation. They play a major role in treating

multiple patients at a given time. Therefore, they should have good reaction time in order to prevent any form of mishaps like falls, during the treatment. Lesser Reaction time helps to achieve in many areas such as sports, driving, defense etc. and by identifying their reaction time we can predict their reacting abilities.

Suryanamaskar is a combination of Yogic postures performed in synchrony with breathing.[3-5] It is a sequence of asnas performed along with pranayama.[4] Practicing Suryanamaskar leads to peaceful mind and reduction in emotional stress.[6,7] Studies have reported that medical students, in general, experience a lot of stress than the general population.[8] Suryanamaskar is an easy technique and includes all the forms of asnas with minimum time consumption and hence can be practiced easily on a daily basis. Hence, keeping the above in mind, this study was planned to investigate the short-term effects of Suryanamaskar on Reaction time in Physiotherapy students.

MATERIALS AND METHODOLOGY

A short-term, experimental study was performed on Physiotherapy Students to find out the effect of Suryanamaskar on Reaction time. The study was conducted at K.J Somaiya college of Physiotherapy, Mumbai. Ethics committee approval was taken and written informed consent was obtained from all the participants in the study. All the participants were randomly assigned into 2 groups (Group A and Group B) equally using a computer-generated randomization table.

Selection criteria

Inclusion criteria for the study were Physiotherapy Students in the age group of 19-25 years, with corrected eye vision and those willing to participate.

Exclusion criteria were those who were unable to perform Suryanamaskar due to Musculoskeletal, Neurological or Cardiovascular condition or who were performing any form of exercises.

PROCEDURE

In both the groups, Reaction time was measured using Deary Liewald Reaction time task software.[9] This software runs on a computer screen where the participants had to press the spacebar key as the cross appeared on the screen. The software measured simple reaction time in milliseconds and also measured the mean, median, mode, standard deviation and variance. Suryanamaskar group was taught all the asanas of ArunaSuryanamaskar and was performed in synchrony with breath. The asnas performed in ArunaSuryanamaskar include- Samasthiti asana, Pada hastha asana, chaturdanda asana, Kokila asana, Meru asana, Anjali mudra, nasargamukha bhastrika.[10]

Group A

Group A performed Suryanamaskar early in the morning, 3 times in a day for 5 days per week for 2 weeks. Reaction time was measured on day 1 (baseline score) and after 2 weeks of performing Suryanamaskar, that is, on day 14th. It was measured again at the end of the 3rd week and 4th week to find out the carryover effects.

Group B

Group B performed 5 minutes of breathing exercises early in the morning, 3 times in a day for 5 days per week for 2 weeks. Reaction time was measured on day 1(baseline scores) and on the 14th day. It was measured again at the end of 3rd week and 4th week.

DATA ANALYSIS AND RESULTS

Table 1- Comparison of experimental and control group before and after performing 3 rounds of Suryanamaskar and 5 minutes of breathing exercises for 2 weeks and to see the carryover effect over a period of 4 weeks in Physiotherapy students.

	Surynamaskar Group	Breathingexs Group	Comparison
Pre values	399.14 ± 49.9	373.71 ± 58.5	0.0690
Post 2 weeks	338.19 ± 42.3	384.80 ± 83.3	<0.001**
Post 3 weeks	338.80 ± 50.5	376.3 ± 62.3	<0.001**
Post 4 weeks	318.95 ± 43.8	398.5 ± 54.3	<0.001**

**Extremely significant P <0.001 by using unpaired t-test. Values are given as mean±SD.

Table-2- Dunn's Multiple Comparison test was used for experimental group (Suryanamaskar Group) to find out the carry over effect of Reaction time over a period of 4 weeks

Difference	P Value	
Pre vs 2nd week	28.000	<0.01*
Pre vs 3rd week	33.000	<0.001**
Pre vs 4th week	49.000	<0.001**
2nd vs 3rd week	5.000	>0.05
2nd vs 4th week	21.000	>0.05
3rd vs 4th week	16.000	>0.05

**Extremely significant P<0.001. *Significant P<0.01.

RESULTS

All the baseline characteristics of the participants were matched and there were no significant differences between the groups with regards to participants age and BMI (for all P>0.10).

There was a significant difference seen in the pre intervention readings when compared to the post 2 weeks' intervention program in the experimental group who performed Suryanamaskar for 2 weeks.

There was a significant difference seen in the pre intervention readings when compared to 3rd and 4th week post intervention readings to see the carryover effects after performing 2 weeks of Suryanamakar which suggests that there was a carryover effect of 2 weeks of Suryanamaskar in the experimental group.

There was no significant difference seen in the control group who performed 5 minutes of breathing exercises pre and post intervention.

There was a significant difference seen in the experimental group when compared to control group suggesting that performing 2 weeks of Suryanamaskar helped to improve reaction time in Physiotherapy students.

DISCUSSION

Our study showed significant improvement in reaction time after performing 2 weeks of Suryanamaskar and also showed a carryover effect of 2 weeks. Similar studies were found by Bhavanani et al, (2013) where immediate effects of Suryanamaskar on reaction time and heart rate were studied in 21 female volunteers. Their study showed significant improvement in reaction time and heart rate post 3 rounds of Suryanamaskar sessions. They suggested that faster reaction time could be due to intermediate level of arousal by conscious synchronisation of dynamic movements along with breathing.[10] Another study done by Noorjehan Begum et al. (2012) reported that yoga restores the under activities of amino butyric acid system and parasympathetic system.[11] The restoration could be due to stimulation of vagal nerves as a result of Yoga training.[12]

The reduction in reaction time may be due to: 1) Increase in VO2 max after performing Suryanamaskar which indicates improved aerobic capacity andexerts only moderate stress on cardio respiratory system by keeping the practitioner within their lactate and anaerobic threshold.[3, 5] 2) Reaction time is fastest within an intermediate level of arousal and is poor in case of too tensed or relaxed state. Exercise improves the reaction time by keeping the muscular tension moderate which shortens the pre contraction reaction time while isometric contraction allows the brain to work faster.[7] 3) Practicing Yoga improves attention, concentration, information processing speed, working memory capacity and mental efficiency.[13]

The limitation of our study was, it was conducted only on females as physiotherapy profession is dominated by females, therefore, the study can be carried out or extended by including male physiotherapists. The study can be carried out in different age groups to find out the effects of Suryanamaskar on reaction time.

CONCLUSION

Suryanamaskar exercise produced significant shortening of Reaction time in Physiotherapy students and performing Suryanamaskar for 2 weeks can be beneficial in improving neuro muscular abilities and such training should be utilised to enhance learning capabilities and quality of life in students of health professions education.

ACKNOWLEDGEMENT

I owe my deep sense of gratitude to Dr. Shweta Manwadkar, Principal K.J Somaiya College of Physiotherapy and Dr. Geeta Bhatt, HOD of Neurophysiotherapy Department for giving me this opportunity to work on this project and supporting me throughout with their constant encouragement.

REFERENCES

1. BatraAnupama, VyasSangeeta, GuptaJitendra, GuptaKapil. A comparative study between young and elderly Indian males on Audio-Visual Reaction Time. Indian J SciRes Technol. 2014; 2(1):25-9.
2. MohanM, Thombre DP, Das AK, Subramanian N, Chandrasekhar S. Reaction time in clinical diabetes mellitus. Indian J PhysiolPharmacol.1984; 28(4):311-4. PMID 6534875.
3. SinhaB, Ray US, Pathak A, Selvamurthy W. Energy cost and cardio respiratory changes during the practice of surya namaskar. Indian J PhysiolPharmacol.2004; 48(2):184-90. PMID 15521557.
4. ModyBhavesh Surendra. Acute effects of surya namaskar on the cardiovascular and metabolic system. J Bodyw Mov Ther.2011; 15(3):343-7. doi: 10.1016/j.jbmt.2010.05.001, PMID 21665111.
5. BhutkarPM, Bhutkar MV, Taware GB, Doijad V, Doddamani BR. Effect of suryanamaskar practice on cardio-respiratory fitness parameters: A Pilot Study. Al Ameen J MedSci.2008; 1:126-9.
6. VaibhavAmit, ShuklaSwati, SinghOm Prakash. Suryanamaskar (sunsalutation) – Apath to Good Health. IntJ PharmacolRes.2016; 6(7):224-30.
7. EtnyreBruce, KinugasaTakashi. Post contraction influences on reaction time. Res Q Exerc Sport.2002;73(3):271-81. doi: 10.1080/02701367.2002.10609020, PMID 12230333.
8. AcharyaShashidhar. Factors affecting stress among Indian dental students. J Dent Educ.2003;67(10):1140-8. doi: 10.1002/j.0022-0337.2003.67.10.tb03707.x, PMID 14587679.
9. DearyIanJ, LiewaldDavid, NissanJack. A free, easy-to-use, computer-based simple and four-choice reaction time programme: the Deary-Liewald reaction time task. Behav Res Methods.2011;43(1):258-68. doi: 10.3758/s13428-010-0024-1, PMID 21287123.
10. BhavananiAnanda Balayogi, RamanathanMeena, BalajiR, PushpaD. Immediate Effects of Suryanamaskar on Reaction time and heart rate in female volunteers. Indian J PhysiolPharmacol.2013;57(2):199-204. PMID 24617172.
11. BegumNoorjehan, Sendil KumaranD, VenkateshG, KulkarniSB. Study of Utility of the Short Course of Yoga to improve Reaction Time. J Clin DiagnRes.September2012;6(7):1241-3.
12. StreeterCC, Gerbarg PL, Saper RB, Ciraulo DA, Brown RP. Effects of yoga on the autonomic nervous system, gamma-aminobutyric-acid, and allostasis in epilepsy, depression, and post-traumatic stress disorder. Med Hypotheses.2012February24;78(5):571-9. doi: 10.1016/j.mehy.2012.01.021, PMID 22365651.
13. Ambreesha Goud KondamNagadeepaWet al. The effects of Yoga in improved cognitive functions in medical students: A Comparative study. NatlJ Physiol Pharm Pharmacol.July2016;7(1):38-42.
14. GuptaDr.Mamta, GargDr.Aparna, GuptaDr.RC. Effect of Pranayama on audio visual reaction time in the medical and paramedical students. J MedSci ClinRes.July2019;7(7):728-34.
15. GodseAnand Sharad, ShejwalBhaskar R, GodseAmrutaAnand. Effects of Suryanamaskar on relaxation among college students with high stress in Pune, India. Int J Yoga. 2015;8(1):15-21. doi: 10.4103/0973-6131.146049, PMID 25558129.
16. AnandPoonam, ChandlaSS, DograRajeev. Effect of yogicasnas on anxiety and GeneralWellbeing of nursingstudents. IntJ Health Sci Res.May2018;8(5):23-7.

How to cite this article: Pankhuri Vairagade, Dr. Geeta Bhatt. Short term effects of Suryanamaskar on Reaction time in Physiotherapy students. Int J of Allied Med Sci and Clin Res 2021; 9(2): 242-245.

Source of Support: Nil. **Conflict of Interest:** None declared.