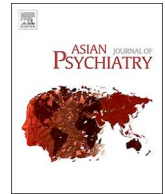




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Letter to the editor

Tele-yoga for stress management: Need of the hour during the COVID-19 pandemic and beyond?



ARTICLE INFO

Keywords:

Tele-yoga

Yoga

Stress management

COVID - 19

Sir,

The COVID-19 pandemic has caused immense psychological distress to many individuals. Tandon (2020a, b) has suggested that there would be immense short-term and long-term impact of the continuing COVID-19 pandemic on mental health of people. Rajkumar (2020) in a recent review of COVID-19 and its effects on mental health reported that 'symptoms of anxiety and depression (16–28 %) and self-reported stress (8 %) are common psychological reactions to the pandemic'. To date, in India, there have been about 626,000 cases of COVID-19, with 18,200 deaths and nearly 20,000 people testing positive every day.

Yoga is an ancient way of living in harmony with oneself (body, emotion and intellect) and nature (Svātmārām, 1975). Yoga - based lifestyle involves positive behavioural modifications (*yamas and niyamas*), practice of physical postures (*asanas*), breath regulation (*pranayama*), control of senses (*pratyahara*) and meditative techniques (*dharana, dhyana and samadhi*) (Iyengar, 1996). Evidence suggests that yoga can be a suitable strategy to enhance individual wellness and reduce stress (Pascoe et al., 2017; Gallegos et al., 2017; Zou et al., 2018) during the COVID-19 pandemic and beyond.

In light of the above, we wanted to test the feasibility, acceptability and usefulness of tele-yoga in stress management instead of traditional yoga classes. The primary aim of this tele-yoga module was to reduce stress and enhance well-being, and it was offered to the general public as a free service from 1st to 30th April 2020. All those who enrolled were invited to participate in an open-label preliminary research intended to test the feasibility and usefulness of yoga in reducing stress. Of the 450 people who logged into this yoga program from all over India, 95 consented to participate in the study by completing an online consent form. Tele-yoga sessions were conducted twice a day, 5 days/week for 4 weeks. Assessments were done using 10-item perceived stress scale (PSS) (Lee, 2012), Yoga Performance Assessment scale (YPA) (Hariprasad et al., 2013) and visual analogue scales (for subjective feedback related to the usefulness and side effects of yoga) at baseline and after four weeks of tele-yoga intervention.

Analyses of the baseline data of 95 participants found that the average age of subjects was 40.39 (± 13.33) years, and females significantly outnumbered males (69 females; chi square test, $p < 0.05$).

Perceived stress scale scores at baseline revealed that a majority of the participants ($n = 75$, 78.94 %) experienced moderate to high levels of stress (PSS scores above the cut-off of 13).

At the end of the four-week tele-yoga module, 54 of the 95 participants had adhered to the program (attended at least 1 session/week and a minimum of 4 supervised sessions) and responded to the post-assessment. They attended an average of 11.48 (± 7.55) sessions and the average of ratings on the difficulty level of the module (on a visual analogue scale from 1–10, with 1 being 'very easy' and 10 being 'very difficult') was 2.20 (± 1.75), suggesting that this yoga module was easy to practice. There was significant improvement in the YPA scores as rated by the trainer from 17.61 (± 2.71) to 26.31 (± 2.91) (paired *t*-test, $p < 0.01$), suggesting that participants were able to learn and perform these tele-yoga practices efficiently.

Comparison of PSS scores at baseline ($n = 54$; mean \pm SD = 17.46 \pm 6.97) and after 4 weeks of tele-yoga intervention ($n = 54$; mean \pm SD = 12.15 \pm 4.59) using paired *t*-test demonstrated a significant reduction in stress levels ($p < 0.01$; 95 % confidence interval - lower limit: 3.21, upper limit: 6.45; effect size = 0.43). Pearson two-tailed correlation test revealed a positive correlation between age and the number of yoga sessions ($n = 54$; $r = 0.37$; $p < 0.01$), indicating that older persons were more likely to attend regularly. There was a strong positive correlation between the number of yoga sessions attended and the extent of reduction in PSS scores (pre minus post scores) in top 25 % of the subjects who responded the best ($n = 13$; $r = 0.93$; $p < 0.01$), suggesting a dose-response relationship. However, no such correlation was observed in the bottom 25 % subjects who responded the least ($n = 13$; $r = -0.06$; $p = 0.63$).

Fifty of the fifty four participants (92.6 %) who completed the yoga module reported it to be safe and feasible. As regards the module's usefulness in reducing stress and enhancing well-being, participants rated it as 9.11 (± 1.11) on a VAS of 1–10 (1 being the least and 10 being the best). After 4 weeks of practice, the following were also noted subjectively: mental relaxation and calmness (36 %); feeling energetic and less tired (23 %); feeling refreshed (18 %); and ability to concentrate (14 %).

To summarise, our preliminary research suggests that tele-yoga intervention can be safe, feasible and useful in improving individual well-

being and reducing stress. The importance of switching from a traditional face-to-face delivery of yoga classes to a tele-yoga format cannot be over emphasised in times of COVID – 19, which seems set to change the world and the way people live forever. Further, the psychological effects of this pandemic can last a long time. Albeit a case of old wine in a new bottle, we see tele-yoga as the way forward, and call for more research in this area.

Post-script

The video of the tele-yoga sessions is freely available online at <https://www.youtube.com/watch?v=n5tpM43wudA&t=2s>, and further details of the tele-yoga program are provided in the Appendix (Table A1).

Financial disclosure

Hemant Bhargav acknowledges funding from the Department of

Appendix A

See Table A1

Table A1
Details of the Tele-yoga Program for Stress Management^a.

S.N.	Name of the Practice (Sanskrit)	Name of the practice (English)	Number of Rounds	Duration (Minutes)	Precautions
1	<i>Shvasa Kriya-1</i>	Hands in and out Breathing	10	2	
2	<i>Shvasa Kriya-2</i>	Hand stretch Breathing	5 rounds each at 90°, 135° and 180°	3	Those with cardiac disorders should not raise the hands above the head.
3	<i>Kati-chakrasana</i>	Spinal Twisting	10	2	
4	<i>Ardha-chakrasana</i>	Forward and Backward Bending	10	3	Eyes should be kept open. Elderly above 50 years of age should use wall support.
5	<i>Vibhagīya Pranayama</i> (<i>Chin mudra, Chinmaya mudra, Adi mudra</i>)	Sectional Breathing	5 rounds each in three mudras (breathing ratio 6:4:8:4)	9	
6	<i>Kapalabhati Kriya</i>	Skull-shining Breath	30 rounds, 2 cycles (rest for 30 s in between)	3	To be avoided during menstruation and 2 nd and 3 rd trimester of pregnancy. To be avoided by those suffering from epilepsy or hernia or those who have undergone abdominal/reproductive organ surgery in the past 6 months.
7	<i>Bhastrika</i>	Bellows Breathing	20 rounds, 3 cycles (rest for 30 s in between)	5	To be avoided by those with cardiac disorders, uncontrolled hypertension and epilepsy. Those with neck pain/cervical spondylosis should perform without raising the hands.
8	<i>Ujjayi</i>	Victorious Breath	9	2	
9	<i>Nadi-shuddhi Pranayama</i>	Alternate Nostril Breathing	6	5	
10	<i>Nadanusandhana</i>	Mantra Chanting (A, U, M)	5 rounds each with A, U, M and AUM together respectively. Feeling vibrations with hand kept on chest, throat and head respectively.	5	Those with migraine/chronic headaches should chant very gently.
Total				40 minutes	

2) Program requires empty stomach condition, 2 h after snacks and 4 h after full meal.

3) All practices should be done with mindfulness synchronising the body and breath.

^a Note: 1) Tele-yoga program should be performed under the supervision of a certified Yoga teacher.

References

- Gallegos, A.M., Crean, H.F., Pigeon, W.R., Heffner, K.L., 2017. Meditation and yoga for posttraumatic stress disorder: a meta-analytic review of randomized controlled trials. *Clin. Psychol. Rev.* 58, 115–124. <https://doi.org/10.1016/j.cpr.2017.10.004>.
- Hariprasad, V.R., Varambally, S., Varambally, P.T., Thirthalli, J., Basavaraddi, I.V., Gangadhar, B.N., 2013. Designing, validation and feasibility of a yoga-based intervention for elderly. *Indian J. Psychiatry* 55 (Suppl 3), S344–349. <https://doi.org/10.4103/0019-5545.116302>.
- Iyengar, B.K.S., 1996. Light on the yoga sutras of Patanjali. *Philos. East West* 46 (2), 291.

Science and Technology (DST), Government of India, New Delhi (Ref. no. DST/005/504/ 2018/01112 – Science and Technology of Yoga and Meditation scheme). Shivarama Varambally is the recipient of a current Wellcome Trust-DBT India Alliance Intermediate Clinical Fellowship [Grant number IA/CPHI/15/1/505026].

Declaration of Competing Interest

NJ and HB delivered the tele-yoga sessions. SV is the Officer-in-Charge of the Integrated Centre for Yoga at NIMHANS, Bengaluru, India.

Acknowledgements

We express our sincere gratitude to the subjects who consented to participate in this study and to our colleagues from the Tele-medicine Unit, NIMHANS, Bengaluru.

<https://doi.org/10.2307/1399412>.

- Lee, E.-H., 2012. Review of the psychometric evidence of the perceived stress scale. *Asian Nurs. Res.* 6 (4), 121–127. <https://doi.org/10.1016/j.anr.2012.08.004>.
- Pascoe, M.C., Thompson, D.R., Ski, C.F., 2017. Yoga, mindfulness-based stress reduction and stress-related physiological measures: a meta-analysis. *Psychoneuroendocrinology* 86, 152–168. <https://doi.org/10.1016/j.psyneuen.2017.08.008>.
- Rajkumar, R.P., 2020. COVID-19 and mental health: a review of the existing literature. *Asian J. Psychiatr.* 52, 102066. <https://doi.org/10.1016/j.ajp.2020.102066>.
- Svātmārāma, 1975. *The Hatha Yoga Pradipika*. Library of Alexandria.
- Tandon, R., 2020a. The COVID-19 pandemic, personal reflections on editorial

- responsibility. *Asian J. Psychiatr.* 50, 102100. <https://doi.org/10.1016/j.ajp.2020.102100>.
- Tandon, R., 2020b. COVID-19 and mental health: preserving humanity, maintaining sanity, and promoting health. *Asian J. Psychiatr.* <https://doi.org/10.1016/j.ajp.2020.102256>.
- Zou, L., Sasaki, J.E., Wei, G.-X., Huang, T., Yeung, A.S., Neto, O.B., Chen, K.W., Hui, S.S.-C., 2018. Effects of mind-body exercises (Tai Chi/Yoga) on heart rate variability parameters and perceived stress: a systematic review with meta-analysis of randomized controlled trials. *J. Clin. Med.* 7 (11). <https://doi.org/10.3390/jcm7110404>.

Nishitha Jasti^a, Hemant Bhargav^a, Sanju George^{b,*},
Shivarama Varambally^a, B N Gangadhar^a

^a *Department of Integrative Medicine, National Institute of Mental Health and Neurosciences, Bangalore, 560029, India*

^b *Rajagiri School of Behavioural Sciences and Research, Rajagiri College of Social Sciences, Rajagiri, Kochi, Kerala, 683 104, India*
E-mail address: sanjugeorge531@gmail.com (S. George).

* Corresponding author.