

Brief Report

Efficacy of video-based relaxation technique to minimize stress in young adults during the COVID-19 pandemic

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ABSTRACT

The uncertainty of the pandemic and rapid changes brought forth stressors for young adults as learning shifted to the online mode and most recreational activities required screen time. The objective was to evaluate the effectiveness of video-based diaphragmatic breathing relaxation technique in reduction of stress levels amongst young adults during COVID-19 pandemic. A quasi-experimental design with a sample size of 30 young adults undertook pre- and post-tests of subscale of Depression, Anxiety, and Stress Scale 21-items (DASS-21), negative emotion questionnaire, and hair cortisol concentration through enzyme-linked-immunosorbent assay technique. The findings indicate that there was a reduction in stress levels as majority of the items on the stress subscale of DASS-21 revealed lower stress at significant level. In addition, post-intervention participants reported a reduction in experience of negative emotions. Therefore, indicating that the diaphragmatic focused video-based intervention was effective in lowering stress and negative emotions.

Keywords: COVID-19 pandemic, Stress, Negative emotions, Video-based relaxation technique, Diaphragmatic breathing

INTRODUCTION

Studies have observed that the rapid psychosocial and physiological changes undergone by adolescents and young adults make them prone to stressors.^[1] As COVID-19 spread, India went through multiple lockdowns^[2] bringing uncertainty and change to the online mode which could have acted as stressors. With soaring excessive screen time/gaming among young adults, there is increased vulnerability to harm to young adults' health due to sedentary lifestyle practices and sleep disturbance.^[3-5] Breathing practices is found to be an effective non-pharmacological intervention for emotion enhancement.^[6] The need was felt to evolve a video-based relaxation approach to help the people in the community. It is hypothesized that the video-based relaxation intervention would reduce levels of stress and negative emotions experienced by young adults.

MATERIALS AND METHODS

In the present study, a single group pre- and post-test quasi-experimental design was adopted with a 1-time video-based relaxation intervention. Purposive sampling was used to determine the sample of 30 college students who attended a dental college in South India. Twenty-six dental college going

participants completed the questionnaires. However, only 13 participants' hair sample was collected in the post-test due to COVID-19 restrictions. The intervention was a 1-time video-based relaxation technique. The duration of the video was for 8 min. In addition, the script and video were content validated by three mental health experts. The video was shot in a professional studio at a tertiary neuropsychiatric care hospital. The video was divided into three segments of 2 min 30 s each. The three segments are:

1. Introduction – It included an introduction to stress, types of stress, signs, and harmful effects of stress. It addressed problems faced by the young adults due to prolonged exposure to screen use
2. Effects of Excessive Screen Time – Mental health experts addressed the health risks and signs faced by young adults due to excessive screen time
3. Diaphragmatic Breathing Technique – This segment focused on the training intervention which introduced diaphragmatic breathing and its benefits during stressful events.

The data were collected over a period of 5 months from August 2021 to January 2022. The intervention was

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administered through online video conference platform zoom and data were collected through Google forms. The selected participants were contacted through calls and messages and permission was sought and granted to collect the hair samples in-person. Screen time questionnaire designed by Vizcanio *et al.* was employed to categorize heavy and light screen users. It is an 18-item questionnaire which measures time spent throughout the week on different screen devices; it is suitable for different cultural contexts and was modified to fit the Indian context. Negative emotions survey questionnaire was used to measure negative emotion. Three-point Likert scale with five items measured negative emotions which obtained face and content validity from mental health experts.

Stress was measured through the stress subscale of Depression, Anxiety, Stress scale 21-items (DASS-21). It is a self-report questionnaire created by Lovibond and Lovibond, consisting of 21 items, seven items per subscale: depression, anxiety, and stress. It is a 4-point Likert scale that participants from 0 (did not apply to me at all) to 4 (applied to me very much). It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated. Sum scores are computed by adding up the scores on the items per (sub) scale and multiplying them by a factor 2.^[7] Hair Cortisol Concentration (HCC) analysis was assessed through the enzyme-linked-immunosorbent assay (ELISA) technique which is equipped to detect HCC. The ELISA technique includes a plate-based method intended for distinguishing and measuring substances such as peptides, proteins, antibodies, and hormones. Cortisol investigation in hair portions has been presented in biomedical examination, showing solid execution as a biological marker reflecting significant stretches of exposure to stress.^[8,9] The cortisol accumulated in developing hair reflects cortisol production under central HPA control. Hair glucocorticoid has been shown to be a chronic stress biomarker to measure dysfunctional HPA axis, which is being associated with cortisol levels^[8] Hair length of up to 12 cm (split into segments of 6 cm each) was collected from the participants for cortisol analysis. The first 5 cm represents the period from August 2021 to December 2021 was taken pre-intervention. Later, 6 cm of hair was taken from the post-interventional samples in January 2022.

After this, interventions were provided through online medium using Zoom call where participants were divided into groups of 5. The developed video on diaphragmatic breathing as a relaxation technique was shown and a brief explanation about the practice was conveyed. A researcher trained in diaphragmatic breathing ensured that the participants were able to perform accurately. The participants were also instructed to practice the technique 2–3 min daily over a period of 3 weeks.

Statistics and ethical considerations

The data were analyzed using sample *t*-test. Wilcoxon rank sum was equipped to find the significance in Hair Cortisol levels was analyzed using IBM SPSS version 28. Furthermore, the study followed the pertinent ethical guidelines and received clearance from the Institution's Ethical Review Board. Informed consent was obtained from participants and actors for the video. Anonymity and confidentiality were maintained by the researchers. The participants were assured that psychosocial support and referral to mental health professional would be provided in case they do experience significant mental distress. Furthermore, all samples from female participants were collected in presence of female researchers to ensure privacy. This study was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

RESULTS

The results show that the average age of participants was 23.1 years ($n = 26$). The study sample majorly consisted of females (76.7%). Participants reported spending 11.4 h on screen time. Most of the young adults (76.9%) did not have any history of medical condition. Majority of the participants have attained graduate level of formal education (65.4%).

Following the video-based relaxation intervention, overall there was significant decrease in experience of stress which was measured through stress subscale of DASS-21 at significant level ($P < 0.05$) [Table 1]. It was also found that participants reported lower level of negative emotions post intervention. There was a reduction in experience of negative emotions ($P < 0.05$).

DISCUSSION

The findings from the present study are supported by previous literature on diaphragmatic breathing which had found that it aids in lowering stress levels.^[6] Only two items on the stress subscale of DASS-21 did not report any significant change which could be due to the fluctuations in the participants' emotional as both the items assessed emotional state. The participants are students at a dental institute, due to COVID-19 restrictions dentists and their practice faced major negative consequences which may contribute in understanding emotional distress.

HCC (in pg/mg) (in 50 mg hair volume) was found to have decreased but not at significant levels. Results found that though there were slight improvements noticed with the mean post-test HCC (30.64 pg/mg) reducing from the mean pre-test HCC (36.37 pg/mg). The result is inconsistent with the previous research^[10] as there was no significant change found in this study. A possible explanation could be that at least 6 weeks is required for significant change in stress

Table 1: Comparison of pre- and post-test stress subscale DASS-21 following video intervention (n=26).

Variable	Median (Range)	Mean±SD	Z-value	P-value
Q1				
Pre-test	1.5 (0-3)	1.54±0.81	-3.83	<0.001*
Post-test	1.0 (0-2)	0.73±0.53		
Q2				
Pre-test	1.0 (0-3)	1.38±0.85	-2.97	0.003*
Post-test	1.0 (0-2)	0.88±0.71		
Q3				
Pre-test	2.0 (0-3)	1.46±0.95	-2.18	0.03*
Post-test	1.0 (0-2)	1.12±0.65		
Q4				
Pre-test	2.0 (0-3)	1.62±0.80	-3.36	0.001*
Post-test	1.0 (0-2)	1.00±0.75		
Q5				
Pre-test	1.5 (0-3)	1.58±0.76	-3.28	0.001*
Post-test	1.0 (0-2)	1.04±0.66		
Q6				
Pre-test	1.0 (0-3)	1.23±0.86	-1.42	0.16
Post-test	1.0 (0-3)	1.00±0.80		
Q7				
Pre-test	1.0 (0-3)	1.12±0.91	-1.16	0.25
Post-test	1.0 (0-3)	1.96±0.72		
Overall score				
Pre-test	10.0 (0-18)	9.92±4.22	-4.14	<0.001*
Post-test	7.0 (0-11)	6.73±3.09		

*Indicates statistically significant difference at $P < 0.05$.

DASS-21: Depression, Anxiety, and Stress Scale-21 Items, SD: Standard deviation

levels;^[6] however, in this study, participants only practiced diaphragmatic breathing and relaxation technique for 3 weeks. Therefore, the participants' experience of stress may have decreased; however, the cortisol biomarker (HCC) may require more time to indicate any change. Nevertheless, this study finds that the 1-time video-based relaxation intervention had a positive impact and was found to be effective in lowering stress and negative emotions which suggests if the technique was practiced longer; it could result in long-term benefits.

CONCLUSION

Our findings could aid in paving the way for further research into the role of new and accessible technologies such as videos in reducing stress and negative emotions in community settings. A few the limitations of the study is that the estimated sample size was 30; however, only 13 post-test hair samples could be collected due to the lockdown imposed on the third wave of COVID-19.

Declaration of patient consent

Institutional Review Board (IRB) permission obtained for the study.

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Conflicts of interest

There are no conflicts of interest.

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