

Online Mindfulness to Deal with Stress during COVID-19 pandemic: A Mixed Method Study in Indian College Students from Kolkata, West Bengal

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Abstract:

Introduction: The COVID-19 pandemic was aggravating the mental stress of vulnerable Indian college students. This mixed-method study aims to explore Mindfulness as a stress - relief tool. **Method:** One hundred and fifty students were randomized to attend online Mindfulness-based intervention (Group M) or usual-care sessions (Group U). Quantitative data in form of perceived stress scores (PSS-10) and qualitative data to understand the student's perspective for stress relief were collected. The quantitative data was subjected to statistical analysis, while thematic analysis was used for the qualitative data. **Results:** The post-program PSS-10 improved ($p < 0.0001$) compared to pre-program scores in group M and post program PSS-10 of group M improved ($p < 0.0001$) when compared to group U. The qualitative data brought forward four emergent themes of the student's coping strategies of stress relief. **Conclusion:** In this current study, the online Mindfulness program had a positive impact on the perceived stress of Indian college students. Further studies will be required to substantiate the results.

Keywords : Mental health, Stress, College students, COVID-19 pandemic, India

Introduction:

The COVID-19 pandemic has psychologically affected two-thirds of Indian undergraduate college students^[1] and 86 % suffered from moderate stress.^[2] The student population was vulnerable to stress, the pandemic only added to their burden. Addressing the negative effect of COVID-19 on the student population (emerging adults) should be a priority.^[3] Research in western countries found college students to benefit from Mindfulness^[4] and National Health Service (NHS, England) recommends Mindfulness for their stress relief.^[5] But quality research with Mindfulness in Indian college students remains limited even after extensive Pubmed and other database search.

Mindfulness is defined as “paying attention in a particular way on purpose, in the present moment,

and non judgmentally.”^[6] The conventional Mindfulness based stress reduction (MBSR) programs are modifiable to online Mindfulness based interventions (MBIs) which are equally effective.^[7] This study aims to see the effects of a brief online Mindfulness intervention on perceived stress score (PSS-10) in Indian college students during pandemic times. A qualitative part added to deepen the understanding of mechanism of stress-relief. Authors formulate a hypothesis that Mindfulness will effectively lower the stress.

Method:

Study settings and design

The prospective study was conducted, using mixed method (both quantitative and qualitative) approach, during February to August 2022. A medical


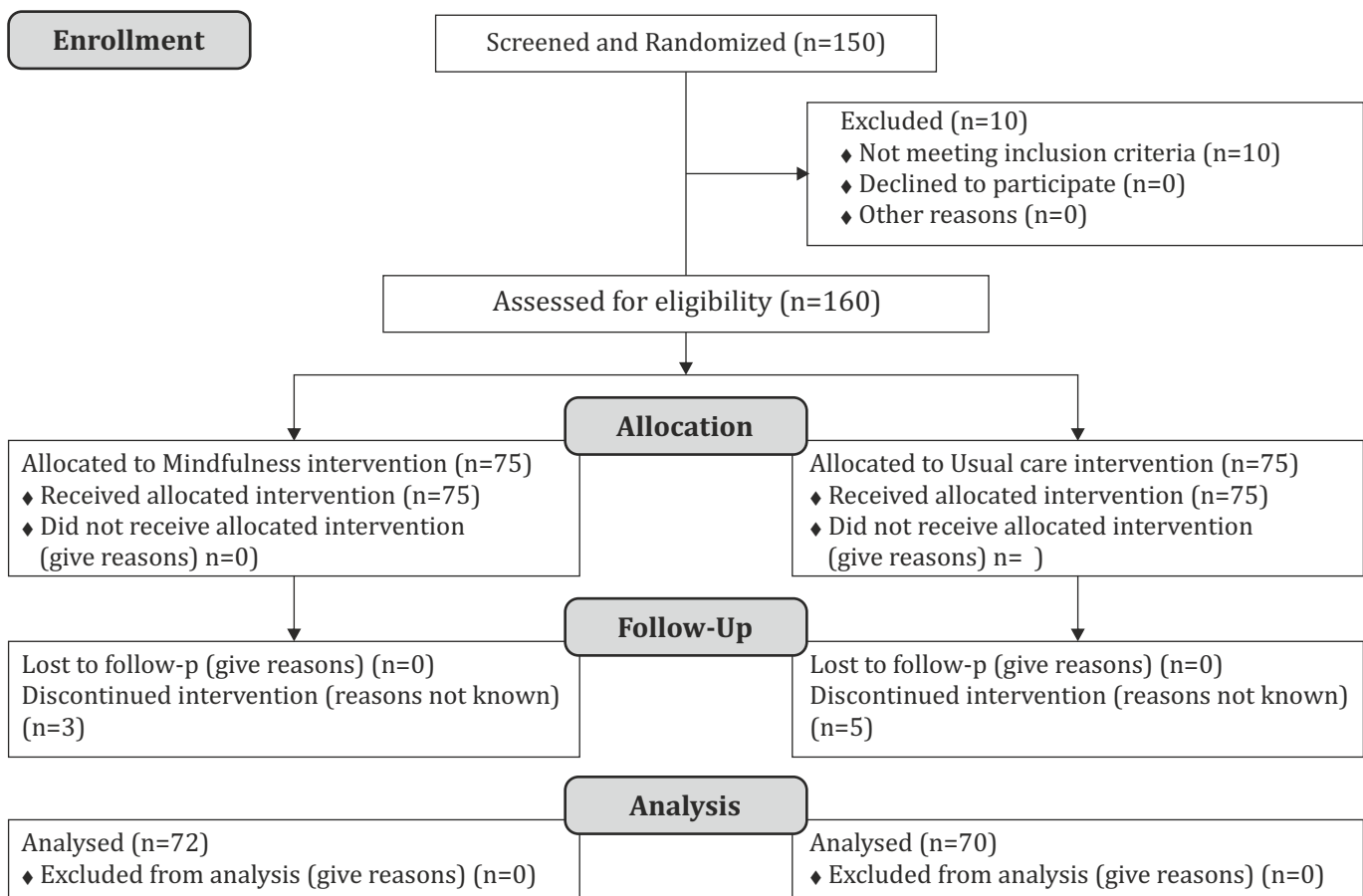
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Figure 1 : Consort 2010 Flow Diagram



institution (in West Bengal, India) collaborated with a Mindfulness center and an undergraduate college to conduct this study. An institutional ethical clearance was obtained, and the study was registered in clinical trial registry of India.

Sample size calculation and randomization

The sample size was calculated based on the assumption of a standard deviation (SD) of 4.10 and 5.77 of the expected difference of mean PSS from the previous non-Indian studies (Huberty J et al and Greeson JM et al) [8-9], with a power of >80% to detect this difference using Paired-t test and Unpaired-t test, with type I error (α) of < 5%. The calculated minimum sample size came out as 64 in each group. Hence the study was started with 150 students (with attrition of 10%). Randomization was done manually using Random Number Tables of By Rand Corporation, USA©1955. [10] For the qualitative part, 22 agreed to be interviewed and 20 (11 female and 9 male) completed the online interviews.

Recruitment

One hundred and fifty students of an undergraduate college (Indian resident with access to electronic device) were screened and informed consent was taken via emails. Any history of diagnosed psychiatric illness/ undergoing psychiatric treatment [anyone with general anxiety disorder (GAD7 score > 10) and patient health questionnaire (PHQ9 score > 20)] or previous experience with Mindfulness were excluded. This study objective was to focus on mild to moderate mental stress (those with significant mental illness were referred to mental health specialists). The recruitment process detailed in the Consort flow diagram. (Figure 1)

Intervention

The online Mindfulness program had the components of the original MBSR program. (Table1)

Table 1: An overview of five sessions Online Mindfulness Program for stress relief in students (Inspired by the NHS approved website-based program)^[11]

Program Details		
Mindfulness instructor was trained via the original MBSR program/ NHS accredited program with experience of more than three years.		
Program: 5 weekly sessions, 1.5 hour durations, daily practice of 20 minutes and with 30-35 students in a group.		
Session Number	Session Focus	In-session Mindfulness practice
1.	Introduction to Mindfulness: Participants were introduced to the concepts of Mindfulness.	Mindfulness of Breathing
2.	Stress response: Participants were explained about the mechanism and perception of Stress.	Body scan exercise
3.	Application of Mindfulness: Participants were made to understand how mindfulness can be used in daily life activities.	Mindful eating: raisin exercise
4.	Practical application in stressful situations: Participants were made to understand how mindfulness can be used in Stress.	Breathing space
5.	Sum up of learnings	Review of all exercises
The group U participants attended similar sessions by the same instructor and practiced non-specific relaxation methods/techniques (excluding mindfulness concepts).		

Measurement tools

The basic participant characteristics (age, sex) were noted at the time of recruitment. PSS-10 was noted at two time points: pre and post-program via mails. The investigator collecting the data was unaware of group allocations. Any participant experiencing any adverse effects were requested to report to the instructor.

Quantitative

PSS-10 is a classic instrument used for stress assessment in research studies.^[12]

Qualitative

The qualitative data was collected from 20 participants (of group M) by semi-structured in-depth online interviews. An open ended research

question was asked: How you have achieved stress relief by using mindfulness? Every participants' responses were recorded. Based on these a thematic analysis was done by the investigators. Two members of the research team (the principal investigator and a co-investigator with extensive experience in qualitative research) were involved in this process.

Data analysis

The quantitative data of PSS were checked for normality, treated as continuous and analysis was performed using Paired and Unpaired t-Test. Baseline characteristics (age, sex) were tested using Unpaired t- test and Chi-square (χ^2) test respectively. The statistical software used was SPSS Statistics for Windows 7® version 18.0.0 (Chicago, IL 60606-

6412) and Graph Pad Prism® In Stat version 5.0. (California 92037-3219) Results were presented as mean (SD) and percentage format. P<0.05 was considered statistically significant.

Results:

Baseline characteristics (age, sex) were similar between the two groups. Mean Perceived Stress Score in both groups is given in Table 2.

Quantitative measures:

PSS Scores:

The post-intervention mean PSS Scores differed significantly between Groups M and U by Unpaired t-

test with p<0.0001 and a large Effect size (d=1.3811) , 95%CI of the above difference was from -4.38 to -2.67 (Table 2) and with in the Group M post-intervention values (compared to pre-intervention) by Paired t-test with p<0.0001 and a large Effect size (d=1.3414) , 95%CI of the above difference was from 3.14 to 4.20 (Table 2) . No adverse effect reported by any participant.

Qualitative measures:

The four themes that emerged were (i) prompt recognition of stress (ii) better understanding of the mechanism of stress (iii) ability to look at stress from

Table 2: Quantitative Analysis of Patient characteristics and mean PSS 10

Variab	Groups Studied				Statistical test and p values			
	Group M (N=72)		Group U (N=70)					
Age Mean (SD)	19.13 (0.56)		19.06 (0.51)		Unpaired t-test (Group M vs. Group U) t=0.75, df=140 p= .44 d(95%CI)=0.13 (-0.11 to 0.24)			
Sex Number (%)	Male= 36 (50.00%)	Female= 36 (50.00%)	Male= 38 (54.28%)	Female= 32 (45.72%)	Chi-Square test (Group M vs. Group U) χ2=0.26, df=1 p= .60			
PSS Mean (SD)	Group M Pre-test	Group M Post-test	Group U Pre-test	Group U Post-test	Unpaired t-test Group M (Pre-test) vs. Group U (Pre-test)	Unpaired t-test Group M (Post-test) vs. Group U (Post-test)	Paired t-test Group M (Pre-test) vs. Group M (Post-test)	Paired t-test Group U (Pre-test) vs. Group U (Post-test)
	21.26 (2.48)	17.60 (2.97)	21.30 (2.47)	21.13 (2.06)	t=0.08, df=140 p= .93 d(95%CI)= 0.01 (-0.86 to 0.78)	t=8.20, df=140 p<0.0001 d(95%CI)= 1.38 (-4.38 to -2.67)	t=13.77, df=71 p<0.0001 d(95%CI)= 1.34 (3.14 to 4.20)	t=1.68, df=69 p= .09 d(95%CI)= 0.07 (-0.03 to 0.37)

M=Mindfulness Group, U=Usual Care Group, SD= Standard Deviation, PSS=Perceived Stress Score, df=degree of freedom, p=p-value of the test (p<0.05 is statistically significant), d=Cohen's d (Effect Size), CI= Confidence interval.

a different perspective (iv) changing the personal way to respond to stress.

Theme one: Prompt recognition of stress

One participant said, "the mindfulness habit is helping to identify the stressors quickly" (S3, female). Another reported "I am improving every day in watching my mind. The factors causing stress are an easy pick now" (S1, male). Yet another said "Mindfulness training is helping me to recognize stressful situations fast before it overwhelms me" (S11, female). A student added, "Now I can sense stress starting to set in even before the physical sensations of stress develop within me" (S18, female). Another concluded "I am able to detect the chain of negative thoughts building up in my mind leading to an overwhelming response" (S20, male). One further added "I am now clear that I was getting hooked in to the uncertainty of COVID-19 and getting stressed." (S2, female)

Theme two: Better understanding of the mechanism of stress

The understanding was reflected in a participant's words "my perception of the fight or flight response is perhaps the game changer for me" (S10, female). Another participant said, "as I am training myself to be calm in a stressful situation, it is giving me a lot of confidence to handle such situations better." (S2, female) One student said, "not allowing my stress related thoughts to build up inside me as I well understand the mechanism now" (S17, male) Another added "I can differentiate the reality from thoughts clouding my mind, and am trying to be in the present moment" (S18, female)

Theme three: Ability to look at stress from a different perspective

A change in perspective was pointed out by one participant "I can now clearly understand that I was over-reacting in most situations." (S2, female) Another added, "Instead of getting into a panic I have started seeing the situation as an observer" (S1, male). A student said, "my acceptance of stress response is allowing me to make a choice." (S11, female). Another commented "I can now well appreciate stories popping out in my mind in different situations though still I cannot work with

them or stop them." (S3, female) A student felt "I am trying to remain non-judgemental even in situations of stress." (S17, male). Another participant said, "I now understand the difference between reaction and response to a stressful situation." (S10, female)

Theme four: Changing the personal way to respond to stress

The response to stress changes as one participant said, "Now I have a choice to react or not react to a stressful situation." (S8, male) Another participant felt "I have started introspecting whether a stressful condition deserves my reaction." (S2, female) Another said, "I feel I am able to let-go negative thoughts better during stress." (S3, female) A student added, "I can now avoid the panic attacks which I used to have in stressful conditions" (S17, male). Another participant said, "Now whenever I feel stressed I am trying to bring my awareness to mindful breathing and it is really helping me" (S1, male). Another added "I am not allowing the stressful thoughts to build up, I am only observing them without getting involved and allowing them to pass." (S20, male) Added "I have developed my own internal mechanism to deal with the stress" (S8, male) Another felt "I am not blindly reacting to stressful situations but trying to be in the present moment and respond" (S11, female). An additional comment "I have started finding inner calm and peace even in stressful situations." (S5, male)

Discussion:

The results of the study proved the hypothesis. The post program PSS-10 of group M when compared to group U showed statistically significant ($p < 0.0001$) improvement. The qualitative data brought forward four main themes: participants learned new ways of coping with the stress.

Previous studies found Mindfulness to decrease stress in US college students.^[4,13] Present study results are in-line with previous studies. In Indian context, a preliminary study by the present group of researchers, found online mindfulness to have a potential for stress relief in general population.^[14] But the student population are more vulnerable to stress, their challenges more diverse and resources meagre. The strengths of this study are the randomized controlled design, additional qualitative data, and a

considerable sample size. So in the Indian perspective, this study is an important step forward for students (emerging adults).

Conclusion:

The effects of online Mindfulness to lower stress in Indian students were encouraging during the COVID 19 pandemic. The qualitative part helps in understanding the students' perspective of coping with stress. Further large-scale studies will be required to integrate Mindfulness practices into student mental healthcare strategies.

Limitations:

The outcome variable was self-reported, the participants were from a single institution, only a single instrument (PSS-10) was used, with no scope of follow-up measurements, remain the limitations of the study.

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Declaration:

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Conflict of Interest: Nil

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