

**Evaluating Effect of Hasya Yoga on Depression, Anxiety and Stress levels Among Medical Undergraduate Students: An Interventional Study**Anupam Suhas Khare<sup>1</sup>, Sagar Ramnath Chavan<sup>2</sup>, Pallavi Yuvaraj Badhe<sup>3</sup><sup>1</sup>Associate Professor, Department of Physiology, Dr. Vasantrao Pawar Medical College, Hospital & Research Centre, Nashik, Maharashtra<sup>2</sup>Associate professor, Department of Physiology, MAEER MIT Pune's MIMER Medical College and Dr BSTR Hospital, Talegaon Dabhade, Pune, Maharashtra<sup>3</sup>Assistant Professor, Department of Physiology, MAEER MIT Pune's MIMER Medical College and Dr BSTR Hospital, Talegaon Dabhade, Pune, Maharashtra

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Conflict of interest: Nil

**Abstract:****Background:** Medical students undergo tremendous academic load, clinical exposure, and emotional pressure, and they have a greater incidence of depression, anxiety, and stress. Conventional methods of management such as counselling and pharmacotherapy have a low rate of success among them. Hasya Yoga (Laughter Yoga), introduced by Dr. Madan Kataria, is an eclectic combination of voluntary laughter, yogic breathing, clapping and group interaction to promote psychological well-being.**Objectives:** To evaluate the impact of Hasya Yoga on depression, anxiety, and stress levels in first-year MBBS students of Maharashtra using the DASS-21 (Depression, Anxiety, Stress Scale).**Material and Methods:** An interventional, randomized controlled trial was conducted among 120 first-year MBBS students from Maharashtra. Random allocation was done for the participants into an intervention (Study) group (n=60) receiving Hasya Yoga and a control group (n=60) to which no intervention was provided. Intervention in study group was for 40 minutes daily, 5 times a week, for 4 weeks. Pre- and post-intervention DASS-21 was administered. Statistical analysis was conducted using paired and unpaired t-tests and Pearson's correlation.**Results and Analysis:** Post Hasya yoga intervention, the study group showed a highly significant reduction in the three parameters: depression ( $18.7 \pm 4.4$  to  $9.8 \pm 3.6$ ), anxiety ( $17.3 \pm 4.1$  to  $8.5 \pm 3.3$ ), and stress ( $21.4 \pm 4.6$  to  $12.3 \pm 3.8$ ). Post-intervention scores of the study group were significantly lower than the control group. A strong negative Correlation was found between Hasya Yoga Practice and Depression, Anxiety & Stress Scores.**Conclusion:** Hasya Yoga is a simple, cost-effective, and non-pharmacological intervention that effectively reduces depression, anxiety, and stress in medical students. Its inclusion in medical curricula may offer a long-term solution for mental health promotion.**Keywords:** Hasya Yoga, Medical Students, DASS-21, Depression, Anxiety, Stress.**DOI:** 10.25258/ijcpr.18.2.23This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Medical students are exposed to too much of academic stress, long study hours, competitive environments and emotional upsets that arise in the course of clinical exposures. [1] Chronic stress can precipitate anxiety, depression, burnout and even suicidal behaviors. [2] It has been found that stress among medical students all over the globe is as much as 70%. [3] Conventional measures to manage stress include counselling, life reorganization, and medications. But more and more, mind-body treatments such as meditation, yoga and humor therapy are being discovered to have integrative effects. [4] Hasya Yoga, Laughter Yoga of Dr. Madan Kataria, is a unique practice involving

voluntary laughter, rhythmic clapping, deep breathing exercise, and positive group interaction. It is based on the belief that the body will not be able to distinguish between voluntary and natural laughter since both share the same physiological and psychological advantages. [5] The current study aims to explore the effect of Hasya Yoga on depression, anxiety and stress scores in undergraduate medical students using a validated DASS-21 scale. [6]

**Materials and Methods**

Permission for the current study was obtained from the institutional ethics committee. The present study

was carried out in 120 first MBBS students in a medical college situated in an urban city of Maharashtra.

**Study Design and Setting:** Interventional trial over 4 weeks.

**Sample Size and Sampling Method:** 120 first MBBS medical students of both genders were approached by random sampling. Age and gender-matched students were then randomly assigned to the Hasya Yoga intervention (Study) group (n=60) and control group (n=60).

**Inclusion Criteria:**

- First MBBS medical students of both genders.
- Volunteering to participate and provide an informed consent form.

**Exclusion Criteria:**

- History of psychiatric disorder or treatment for psychiatric disorders.
- Prior practice or experience of laughter therapy or any other intervention.
- Incomplete DASS-21 questionnaire response.

DASS-21 questionnaire was administered to the intervention (Study group) and control group before intervention. The responses and scores were noted.

**Intervention:** The intervention group (Study group) was given 40 minutes of Hasya Yoga daily, 5 times a week, for 4 weeks. The sessions were conducted by a certified laughter yoga teacher and included deep breathing, playful laughter exercises, clapping and guided relaxation.

The technique followed the guidelines established by Dr. Madan Kataria, [5] the founder of the Laughter Yoga movement. Each session included the following elements:

- Clapping and Chanting (5 minutes): The class proceeded by clapping the rhythm in 1-2, 1-2-3, and thereafter repeated chanting of "Ho-Ho, Ha-Ha-Ha" so that the class gets a lively and optimistic rhythm. This will get the body relaxed and charge up the group at the energetic level.
- Breathing Exercises (5 minutes): Deep yogic breathing was also included in between the laughter exercises. This comprised slow nasal inhaling, brief breath retention and exhaling

through the mouth. The exercises relaxed the nervous system and delivered oxygenation.

➤ Laughter Exercises (20 minutes):

Several mimicry laughter techniques were carried out. These comprised:

- Greeting laughter: Exchanging handshakes and looking into the other person's eyes and laughing.
- Milkshake laughter: Faking mixing and drinking fantasy milkshakes while laughing.
- Silent laughter: Laughing in silence but maintaining eye contact.
- Argument laughter: Imitate an argument using fake gestures and laughter.
- Lion laughter: Pushing out the tongue, opening hands into claw positions and laughing.

The exercises induced spontaneous laughter that soon became authentic as a result of group dynamics and eye contact, taking advantage of the fact that the body couldn't differentiate between real and imagined laughter.

➤ Laughter meditation (5 minutes): The workshop concluded with laughter meditation, with the participants seated or reclining and laughing freely without guided movement or voice. This provided an atmosphere of release of emotions and mental relaxation.

➤ Cool-down and relaxation (5 minutes): End relaxation was achieved through positive affirmation and guided imagery to allow the participants to absorb the happy atmosphere and go about their day in a peaceful frame of mind.

The overall program design tried to replicate playfulness, suppress inhibition and let off steam by way of the mind-body connection established through laughter. All sessions took place in a spacious quiet room to ensure interaction among participants and minimize distraction.

**Assessment Tool:** The DASS-21 (Depression Anxiety Stress Scale - 21 items) was used to assess stress levels before and after the intervention. Each item was rated on a 4-point Likert scale. The stress subscale includes 7 items and scores were multiplied by 2 to calculate final severity.

**DASS-21 Questionnaire:** Students were instructed to read each statement and circle a number 0, 1, 2, or 3 that indicates how much the statement applied to him/her over the past week.

**A. Scoring scale**

Score	Meaning
0	Did not apply to me at all
1	Applied to me to some degree, or some of the time
2	Applied to me to a considerable degree, or a good part of time
3	Applied to me very much, or most of the time

**B. Statements**

Sr. No.	Statements
1	I found it hard to wind down
2	I was aware of dryness of my mouth
3	I couldn't seem to experience any positive feeling at all
4	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)
5	I found it difficult to work up the initiative to do things
6	I tended to over-react to situations
7	I experienced trembling (e.g., in the hands)
8	I felt that I was using a lot of nervous energy
9	I was worried about situations in which I might panic and make a fool of myself
10	I felt that I had nothing to look forward to
11	I found myself getting agitated
12	I found it difficult to relax
13	I felt down-hearted and blue
14	I was intolerant of anything that kept me from getting on with what I was doing
15	I felt I was close to panic
16	I was unable to become enthusiastic about anything
17	I felt I wasn't worth much as a person
18	I felt that I was rather touchy
19	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)
20	I felt scared without any good reason
21	I felt that life was meaningless

**C. Scoring Guide:**

Each of the three subscales contained 7 items. To calculate the final score for each:

- Depression: Items 3, 5, 10, 13, 16, 17, 21

- Anxiety: Items 2, 4, 7, 9, 15, 19, 20
- Stress: Items 1, 6, 8, 11, 12, 14, 18

Scores for each subscale were added up and multiplied by 2 to get the final score (to match the full 42-item DASS version).

**1. Depression Scale**

Severity	Score Range
Normal	0–9
Mild	10–13
Moderate	14–20
Severe	21–27
Extremely Severe	28+

**2. Anxiety Scale**

Severity	Score Range
Normal	0–7
Mild	8–9
Moderate	10–14
Severe	15–19
Extremely Severe	20+

**3. Stress Scale**

Severity	Score Range
Normal	0–14
Mild	15–18
Moderate	19–25
Severe	26–33
Extremely Severe	34+

**Statistical Analysis:** Data was analyzed using SPSS version 26. Paired t-test was used to compare pre- and post-intervention stress scores within groups. Independent t-tests compared the two groups. Pearson correlation assessed the relationship

between Hasya Yoga participation and stress scores. A p-value of <0.05 was considered statistically significant.

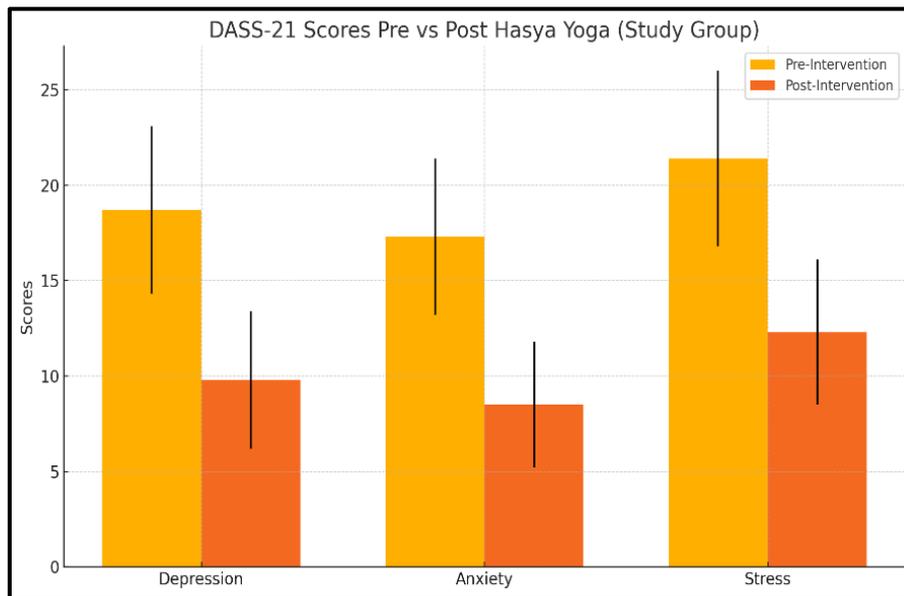
**Results**

**Table 1: Baseline Characteristics of Participants before intervention**

Baseline Parameters	Study/ Intervention Group (n=60)	Control Group (n=60)	p-value	Statistical significance
Age (mean ± SD)	20.4 ± 1.2	20.6 ± 1.3	p>0.05	Not significant
Gender (M: F)	28:32	30:30	p>0.05	Not significant
Depression	18.7 ± 4.4	17.6 ± 4.7	p>0.05	Not significant
Anxiety	17.3 ± 4.1	16.2 ± 4.4	p>0.05	Not significant
Stress	21.4 ± 4.6	20.3 ± 4.8	p>0.05	Not significant

**Table 2: Comparison of DASS-21 parameters in Study/ Intervention group before and after intervention**

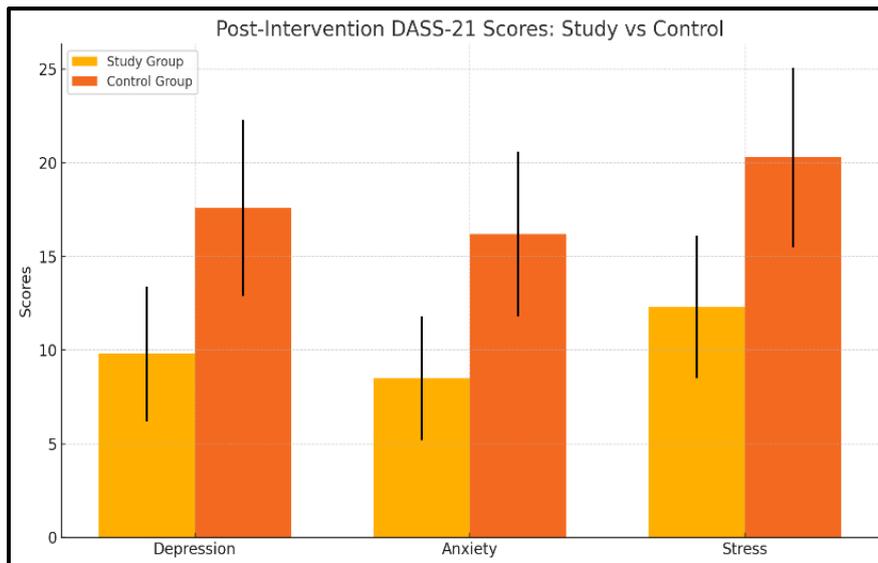
Parameter	Pre-Intervention Score (mean ± SD)	Post-Intervention Score (mean ± SD)	p-value	Statistical significance
Depression	18.7 ± 4.4	9.8 ± 3.6	<0.001	Highly significant
Anxiety	17.3 ± 4.1	8.5 ± 3.3	<0.001	Highly significant
Stress	21.4 ± 4.6	12.3 ± 3.8	<0.001	Highly significant



**Graph 1: Comparison of DASS-21 parameters in Intervention/Study group before and after Intervention**

**Table 3: Comparison of DASS-21 parameters between Study group (post Intervention) and Control Group**

Parameter	Study Group - post intervention (mean ± SD)	Control Group (mean ± SD)	p-value	Statistical Significance
Depression	9.8 ± 3.6	17.6 ± 4.7	<0.001	Highly significant
Anxiety	8.5 ± 3.3	16.2 ± 4.4	<0.001	Highly significant
Stress	12.3 ± 3.8	20.3 ± 4.8	<0.001	Highly significant



**Graph 2: Comparison of DASS-21 parameters between study group (post Intervention) and Control Group**

**Table 4: Correlation between Hasya Yoga Practice and Depression, Anxiety & Stress Scores**

Variable	Pearson Correlation (r)	Significance (p-value)
Hasya Yoga sessions vs. Depression	- 0.60	< 0.001
Hasya Yoga sessions vs. Anxiety	- 0.58	< 0.001
Hasya Yoga sessions vs. Stress	- 0.64	< 0.001

**Discussion**

In the present study, there was no statistically significant difference ( $p > 0.05$ ) in baseline characteristics of participants like age, gender, depression, anxiety and stress levels before intervention in both control and intervention/study groups. So, both groups were comparable with respect to these parameters. (Table 1)

The present study presented a statistically significant reduction in depression, anxiety, and stress scores following Hasya Yoga intervention among undergraduate medical students, as assessed by the DASS-21 scale (Table 2, Graph 1). [7] The Depression, anxiety and stress score reduced in intervention group indicating noteworthy improvement in psychological well-being [8] validating the targeted benefit of the intervention (Table 3, Graph 2). [9] Correlation study (Table 4) revealed strong to moderate negative correlation between frequency of attendance for Hasya Yoga sessions and depression, anxiety and stress scores ( $r = -0.64$ ,  $p < 0.001$ ), which revealed more relief in stress with higher attendance. [10] The same relief was seen in depression and anxiety, thereby establishing the effectiveness of laughter-based therapy in handling emotions. [11] A randomized trial conducted by Hasan et al. among nursing students also documented a 30% decrease in perceived stress using similar laughter-based modules in line with the outcome of this study. [12] Improved mood and decreased anxiety levels among

adolescent students following Hasya Yoga intervention were also indicated by Mahgoub et al. [13] The value of change seen in our study is slightly higher, perhaps due to higher baseline stress among medical students and the official conduct of Hasya Yoga sessions.[14] Shahidi et al., in a meta-analysis, found that laughter therapy reduced stress and anxiety across a wide range of age groups and populations.[15] In a study by Ramesh et al. in India, laughter yoga reduced cortisol levels and enhanced parasympathetic activity, confirming its physiological stress-reducing properties. [16] Group laughter also serves as a podium for peer affinity, reduces isolation, and creates emotional catharsis, which are all imperatives in medical school settings. [17] The ease of use, affordable costs, and non-invasiveness of Hasya Yoga render it as a suitable part of medical courses or wellness components.[18]

Yet, there are limitations. The research was performed in one institution and had limited follow-up duration of 4 weeks only. Additionally, the use of self-report measures such as DASS-21 may be subject to subjectivity, though the instrument is extensively validated. [19] Long-term follow-up, salivary cortisol assessment, and multi-centre recruitment should be included in future studies to enable generalization of results. [20]

**Conclusion**

The present study establishes that Hasya Yoga is a low-cost, effective and non-pharmacological intervention for greatly reducing depression,

anxiety, and stress scores in undergraduate medical students. Post-intervention results showed highly significant improvement in all three dimensions of the DASS-21 scale, with significant negative correlations between the number of sessions of Hasya Yoga and DASS parameters. Compared to the control group, the intervention group significantly improved psychologically, highlighting the therapeutic potential of laughter-based exercises within a systematised context. Given the growing disease burden of mental illness in medical students, incorporation of Hasya Yoga in student well-being programs could be an effective preventive and therapeutic tool. Multicentre trials with extended follow-up and addition of physiological markers of stress are recommended to replicate and extrapolate these findings.

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