

Original Research Article

Punjab breathes better: yoga's role in mental health revolutions

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ABSTRACT

Background: Due to exhausting fast pace of life, stress has become an integral part of our lives. It further leads to various physical and psychiatric disorders. Contrarily Yoga has been proven to be beneficial in improving our overall health. Doing a non-psychopharmacological intervention like Yoga alone in people have stress, depression, anxiety and insomnia in Mohali having 'C.M di Yogshala (CMDY)' initiative. CMDY is being run by the Guru Ravidas Ayurveda University, Hoshiarpur (GRAU), Govt of Punjab. To see the efficacy of Yoga in people coming to CMDY in Mohali having stress, depression, anxiety and insomnia.

Methods: 120 individuals suffering from depression, anxiety, stress and insomnia were consecutively enrolled in study from Mohali having CMDY. DASS-21 (21 itemed depression, anxiety and stress scale) was applied to diagnose depression, anxiety and stress. To diagnose insomnia, Insomnia Severity Index (ISI) was used. To further confirm diagnosis of depression, anxiety and insomnia, International Classification of Diseases 10th edition for mental health and behavioral disorders (ICD-10) was used. For confirming stress, serum cortisol levels were analyzed. Above mentioned scales were applied at baseline and at 3 months after intervention is over. Yogic intervention was provided by trained Yoga instructors daily for 1 hour for 3 months. Data was analyzed statistically on SPSS-22.0.

Results: 16 individuals out of 120 dropped out. 104 individuals followed back till the end of the study. There was significant reduction in DASS-21 score after 3 months of yoga. Serum cortisol levels also decreased from baseline after 3 months.

Conclusion: This study concluded that yoga reduces severity of depression, anxiety and stress.

Keywords: Depression, Anxiety, Stress, Insomnia, Yoga, CM di Yogshala(CMDY), GRAU

INTRODUCTION

Worry or mental tension in a stressful situation is called stress.¹ Due to exhausting fast pace of life, it has become the integral part of our lives. Sometimes it propels us to perform better in our endeavors. When it exceeds, it causes physical and mental illnesses. Under chronic stress, our hypothalamus releases a hormone called corticotrophic releasing hormone (CRH). CRH acts on pituitary corticotrophs and causes secretion of adreno- cortico- trophic

hormone (ACTH). This ACTH further stimulates adrenal cortex. From here cortisol is released. Serum cortisol has negative feedback on upstream pathway.² Cortisol helps body to adopt with stressors for long periods of time. It promotes glucose formation. Initially it is adoptive as body has more fuel available. In long run proteins are used to make this fuel. Now proteins are important for formation of important cells of body like white blood cells (WBCs). This makes host more immunosuppressive. Prolonged elevation of cortisol further leads to hypertensions,

diabetes, atherosclerosis, congestive cardiac failure.³ Stress is also responsible for many psychiatric illnesses like anxiety disorders, depression, insomnia and psychosomatic disorders.⁴ Complementary medical practices like Yoga unfortunately have not been promoted much in current evidence-based medicine. But recent studies are showing its benefits in improving overall physical and mental wellbeing.⁵ Bridges et al in their systematic review evaluated 23 interventional studies involving Yogic interventions in patients of depression. Sample size was yet small in these studies; still yogic interventions were considered efficacious in treating depression.⁶ Yoga has also been found effective in anxiety disorders. Many relaxation techniques and breathing exercises are the part of contemporary psychotherapies.⁷ Yoga also improves our sleep quality.⁸ Research has shown that it is beneficial in insomnia patients. It helps in sleep maintenance, sleep sustenance, decreases terminal arousal.⁹

Novelty/ innovation

This study was a large-scale intervention in patients suffering from major depressive disorder (MDD), general anxiety disorder (GAD), insomnia and stress (not on any pharmacological intervention) in Mohali having CM Di Yogshalas (CMDY).

Study objective

To see the efficacy of Yoga in people coming to CMDY in Mohali having stress, depression, anxiety and insomnia.

METHODS

This interventional study was conducted at CM Di Yogshala centers in Mohali from September 2023 to December 2023. A total of 120 individuals suffering from depression, anxiety, stress, and insomnia were consecutively enrolled

Study population

People having anxiety, depression, insomnia and stress coming to CM di Yogshala (CMDY).

Inclusion criteria

Individuals who screened positive for depression, anxiety, stress, and insomnia and who provided informed consent were included in the study.

Exclusion criteria

Participants who were receiving psychiatric medications, those with chronic physical illnesses, individuals with intellectual disability, and those unable to complete the three-month follow-up period were excluded.

Project implementation plan

Interventional study was carried in Mohali having CMDY. Volunteering paramedical staff (Yoga Trainer/GNM/ B.Sc. Nursing/ D. Pharma/ B. Pharma) were trained for 6 days per week to diagnose depression, anxiety, insomnia and stress. To use study instruments effectively. Volunteering staff used to go to different CMDYs of Mohali. They screened people having depression, anxiety and stress using DASS-21. They screened insomnia using ISI. Diagnosis of depression, anxiety and insomnia was confirmed through ICD-10. Stress was confirmed through morning 8 AM serum cortisol levels. Above mentioned instruments were applied at baseline (i.e., before beginning Yoga sessions). Yoga classes were taken by trained experts of the field on 6 days per week (for one hour each day) for three months. Same instruments were applied again after three months to see the efficacy of Yoga as a standalone therapeutic tool in these mental health conditions. Results were statistically analyzed using SPSS-22.0.

Ethics review

All participants will be told about the project and methodology. Consent will be taken from them in written and verbal form in their local language. Institutional Ethics Committee permission shall be taken.

Data compilation and statistical exploration

Following instruments were employed for data collection.

Depression anxiety stress scale- 21

It is a short tool with 21 items, which are divided into three subsections (7 questions each in depression, anxiety and stress). Each question is scored on 4-point Likert scale; where 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 good part of time, 3=Applied to me very much or most of time. Scores are calculated separately for each domain. Scores are calculated separately for all three domains. Scoring template is as follows.

Table 1: Severity classification of depression, anxiety and stress according to DASS-21 scoring system.

| | Depression | Anxiety | Stress |
|-------------------------|------------|---------|--------|
| Normal | 0-9 | 0-6 | 0-14 |
| Mild | 10-13 | 8-9 | 15-18 |
| Moderate | 14-20 | 10-14 | 19-25 |
| Severe | 21-27 | 15-19 | 26-33 |
| Extremely severe | 28+ | 20+ | 34+ |

Assessment is done over the previous 7-day time period.¹⁰ Individual subscales and overall scale's cronbach's alpha

demonstrates remarkable internal consistency. Average inter-item correlation and corrected inter-item correlation for each of subscales indicates decent differences.¹¹

Insomnia severity index

It measures current perceived insomnia symptomatology and sleep difficulties faced in last 2 weeks. It contains seven questions. Every item is scored from 0 to 4. Total of all items is done. Interpretation is done as.

0-7=No clinically significant insomnia. 8-14=Subthreshold insomnia. 15-21= Clinical insomnia (moderate severity). 22-28=Clinical insomnia (Severe). Studies have shown adequate indices for internal consistency (Cronbach’s alpha=0.78) and a good validity.¹²

Serum cortisol levels

It is a non-invasive method to estimate serum cortisol level. It is indicative of hyperactive hypothalmo- pituitary adrenal axis (HPA axis). In stress disorders it is usually active. It is usually measured in morning at 8 AM. Normal levels are 54.94 to 287.56 ng/ml.¹³

N.B. CMDY project- It is a project started by Government of Punjab. It aims to make people of Punjab aware about benefits of Yoga and meditation. It encourages people to participate in Yoga sessions and reap mental and physical health benefits. It is completely free of cost. Under this project a team of trained and certified Yoga teachers is appointed. They facilitate practice of Yoga door to door by providing free Yoga classes. People interested can contact on provided toll free numbers or can register on official website at <https://cmdiyogshala.punjab.gov.in>. Classes happen in parks and open spaces. Initially this project was

launched in key cities of Punjab like Amritsar, Patiala, Ludhiana. Efforts were made to expand it all over state. This scheme later reached even block and village level. As per 2024-2025 data in Punjab Newslines, there were 1600 yogshalas and 35,000 people participating in classes. According to ANM English news health minister of Punjab had made a statement that over 2 lakh people across the state were doing Yoga daily. This project is not only reviving our ancient Indian culture but also empowering youth by providing employment opportunities and is also inculcating a sense of community wellbeing.¹⁴

RESULTS

A total of 104 participants completed the study. The majority belonged to the 51–65-year age group (50.96%), and females constituted 63.46% of the sample. Most participants were graduates or had higher educational qualifications (79.8%). A large proportion were retired (34.62%) or unemployed (37.50%).

Insomnia severity showed improvement after three months of Yoga intervention. The proportion of participants with no clinically significant insomnia increased from 69.23% at baseline to 76.92% after intervention. Mean ISI score significantly decreased from 6.29±6.08 to 4.24±4.49 (p=0.014). Stress levels significantly reduced following Yoga practice, with an increase in participants in the normal stress category from 74.04% to 84.62% (p=0.036). However, changes in depression and anxiety scores were not statistically significant. Serum cortisol levels showed a marked reduction after the intervention, with participants having elevated cortisol decreasing from 68.27% at baseline to 15.38% after three months. The mean cortisol level significantly reduced from 26.19±9.98 µg/dl to 14.27±7.69 µg/dl (p=0.001).

Table 2: Sociodemographic profile of 104 individuals completing the study.

| Sociodemographic information | | Individuals | |
|------------------------------|---------------|-------------|------------|
| | | Patients | Percentage |
| Age group (in years) | 18-35 | 9 | 8.65 |
| | 36-50 | 23 | 22.12 |
| | 51-65 | 53 | 50.96 |
| | 66-80 | 19 | 18.27 |
| Gender | Female | 66 | 63.46 |
| | Male | 38 | 36.54 |
| Education | Illiterate | 0 | 0 |
| | Primary | 2 | 1.92 |
| | Upto Matric | 8 | 7.69 |
| | Undergraduate | 11 | 10.58 |
| | Graduate | 73 | 70.19 |
| | Post Graduate | 9 | 8.65 |
| Occupation | Ph.D. | 1 | 0.96 |
| | Advocate | 1 | 0.96 |
| | Businessman | 1 | 0.96 |

Continued.

| Sociodemographic information | Individuals | | |
|------------------------------|-------------|------------|-------|
| | Patients | Percentage | |
| Employed | 18 | 17.31 | |
| Housewife/ Housemaker | 4 | 3.85 | |
| Retired | 36 | 34.62 | |
| Self-Employed | 3 | 2.88 | |
| Student | 2 | 1.92 | |
| Unemployed | 39 | 37.5 | |
| Marital status | Unmarried | 5 | 4.81 |
| | Married | 92 | 88.46 |
| | Widow | 7 | 6.73 |

Table 3: Comparison of scores of Insomnia severity index at baseline and after 3 months.

| Insomnia severity index | Baseline | | After 3 months | |
|--|-----------|------------|----------------|------------|
| | Patients | Percentage | Patients | Percentage |
| No clinically significant insomnia (0-7) | 72 | 69.23 | 80 | 76.92 |
| Subthreshold insomnia (8-14) | 23 | 22.12 | 23 | 22.12 |
| Clinical insomnia: moderate severity (15-21) | 5 | 4.81 | 1 | 0.96 |
| Clinical insomnia: severity (22-28) | 4 | 3.85 | 0 | 0 |
| Mean±SD | 6.29±6.08 | | 4.24±4.49 | |
| Median | 5.00 | | 3.00 | |
| Range | 0-25 | | 0-19 | |
| Mann-Whitney U | 2.462 | | | |
| 0 value | 0.014 (S) | | | |

Table 4: Comparison of depression, anxiety & stress at baseline and after 3 months.

| Characteristics | Baseline | | After 3 months | |
|--------------------------------|------------|------------|----------------|------------|
| | Patients | Percentage | Patients | Percentage |
| Depression | | | | |
| Normal (0-9) | 78 | 75 | 78 | 75 |
| Mild (10-13) | 11 | 10.58 | 8 | 7.69 |
| Moderate (14-20) | 10 | 9.62 | 12 | 11.54 |
| Severe (21-27) | 5 | 4.81 | 4 | 3.85 |
| Extremely severe (≥ 28) | 0 | 0 | 2 | 1.92 |
| Mean±SD | 5.28±6.72 | | 5.72±7.82 | |
| Median | 2.00 | | 2.00 | |
| Range | 0-26 | | 0-36 | |
| Mann-Whitney U | 0.097 | | | |
| P value | 0.923 (NS) | | | |
| Anxiety | | | | |
| Normal (0-7) | 59 | 56.73 | 63 | 60.58 |
| Mild (8-9) | 7 | 6.73 | 7 | 6.73 |
| Moderate (10-14) | 24 | 23.08 | 17 | 16.35 |
| Severe (15-19) | 8 | 7.69 | 6 | 5.77 |
| Extremely severe (≥ 20) | 6 | 5.77 | 11 | 10.58 |
| Mean±SD | 7.15±6.95 | | 7.12±7.69 | |
| Median | 6.00 | | 4.00 | |
| Range | 0-32 | | 0-30 | |
| Mann-Whitney U | 0.366 | | | |
| P value | 0.714 (NS) | | | |
| Stress | | | | |
| Normal (0-14) | 77 | 74.04 | 88 | 84.62 |
| Mild (15-18) | 7 | 6.73 | 7 | 6.73 |
| Moderate (19-25) | 13 | 12.50 | 7 | 6.73 |

Continued.

| Characteristics | Baseline | | After 3 months | |
|--------------------------------|-----------------|------------|-----------------|------------|
| | Patients | Percentage | Patients | Percentage |
| Severe (26-33) | 7 | 6.73 | 2 | 1.92 |
| Extremely severe (≥ 34) | 0 | 0 | 0 | 0 |
| Mean \pm SD | 9.87 \pm 9.22 | | 7.44 \pm 7.25 | |
| Median | 8.00 | | 6.00 | |
| Range | 0-32 | | 0-26 | |
| Mann-Whitney U | 2.106 | | | |
| P value | 0.036 (S) | | | |

Table 5: Comparison of serum cortisol levels at baseline and after 3 months of yoga intervention.

| Serum cortisol level ($\mu\text{g/dL}$) | Group A | | Group B | |
|---|------------------|------------|------------------|------------|
| | Patients | Percentage | Patients | Percentage |
| Below (<6.7) | 7 | 6.73% | 9 | 8.65 |
| Normal (6.7-22.6) | 26 | 25% | 79 | 75.96 |
| Above (>22.6) | 71 | 68.27% | 16 | 15.38 |
| Mean\pmSD | 26.19 \pm 9.98 | | 14.27 \pm 7.69 | |
| Median | 28.71 | | 11.03 | |
| Range | 4.07-42.54 | | 5.07-36.68 | |
| Mann-Whitney U | 7.857 | | | |
| p value | 0.001 (S) | | | |

DISCUSSION

This study was conducted across multiple cities in Punjab where the CM di Yogshala (CMDY) initiative is being implemented. Several significant findings emerged from this project.

It was observed that 69.23% of individuals who visited CMDY were above the age of 50 years. This means that older adults are more willing to acknowledge and adopt traditional practices such as Yoga compared to younger individuals. Several factors may contribute to this trend, including heightened health concerns, a desire for mobility and independence, and a pursuit of a disease-free life in the later stages of life. Additionally, increased availability of time post-retirement and a stronger connection to religious and traditional values could be influencing factors. In contrast, younger individuals are often preoccupied with career advancement and job-related commitments, which may lead them to neglect their health. Integrating Yoga into daily routines is essential. Corporate offices, schools, colleges, and other institutions should actively encourage employees and students to engage in regular Yoga practice, as it has the potential to enhance both productivity and academic performance.

It was also found that 63.46% of participants were female, indicating that women are more proactive about their mental and physical well-being than men. One possible explanation is that in many Indian households, men are the primary earners and may find it difficult to allocate time for self-care due to work responsibilities. Notably, men's mental health is a growing concern in India. According to

surveys, the male-to-female suicide ratio stands at 1.2:1.¹⁵ Contributing factors may include rigid cultural constructs of masculinity, barriers to seeking help, financial stress, unemployment, and other socio-economic pressures.¹⁶ There is a pressing need to promote men's mental well-being through awareness campaigns, accessible support systems, and the advocacy of holistic practices like Yoga, mindfulness, and stress management. Encouraging help-seeking behaviour among men is particularly crucial. Another noteworthy observation was that 79.8% of CMDY participants had educational qualifications up to graduation or higher. This suggests that people with higher educational status will engage more in Yoga. Therefore, incorporating Yoga into formal school curricula could serve as a vital tool for fostering holistic physical and mental wellness from an early age. Regarding employment status, 34.62% of participants were retired, and 37.50% were unemployed. Only 2.88% and 1.92% of the participants were employed or students, respectively. This reflects a tendency for individuals with busy professional or academic schedules to neglect Yoga. However, a healthy work-life balance is fundamental for both personal success and overall well-being. Individuals should be encouraged to manage their schedules effectively to include time for self-care practices like Yoga.

Importantly, in this study it was noted that a significant reduction in the anxiety and stress components of the DASS-21 occurred after three months of regular Yoga practice. These findings align with those of Sohani et al who reported a decrease in depression, anxiety, and stress scores following 12 sessions of daily Hatha Yoga.¹⁷ Yoga as a practice includes certain physical postures (asanas), some breathing techniques (pranayama), and meditation

(dhyana). Research shows that Yoga reduces sympathetic nervous system activity while enhancing parasympathetic tone.¹⁸ Deep breathing increases oxygen supply to the brain and other parts of the body. When combined with mindfulness, it cultivates awareness of anxious and stressful thoughts.¹⁹ Studies have demonstrated that mindfulness-based meditation improves cerebral blood flow to the prefrontal cortex (PFC), which activates the thalamic reticular nucleus, subsequently increasing GABA activity. Enhanced GABAergic tone is associated with reduced anxiety.²⁰ Furthermore, regular Yoga practice has been linked to increased serotonin levels, decreased norepinephrine, and reduced serum cortisol levels.²¹ It also alters brain wave activity, increasing alpha, beta, and theta waves while reducing delta wave percentage, as shown in electroencephalography (EEG) studies.^{22,23}

Neuroimaging research indicates that consistent Yoga practice can increase grey matter volume in critical brain areas such as the hippocampus, somatosensory areas, cingulate cortices, insular cortex, and orbitofrontal cortex.²⁴ It also reduces activity in the amygdala and enhances activity in the PFC, hippocampus, and anterior cingulate cortex.²⁵ These changes may explain the therapeutic effects of Yoga on individuals with depression, anxiety, and stress. Our study further supports this by demonstrating a statistically significant reduction in 8:00 AM serum cortisol levels after three months of Yoga practice.

Yoga should be integrated into everyone's daily routine and can serve as a complementary approach alongside pharmacological and non-pharmacological treatments for stress, anxiety, and depression. It should be recognized as an important element within the field of alternative and complementary medicine

CONCLUSION

This study concluded that yoga reduces severity of depression, anxiety and stress.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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