

Effectiveness of Yoga-Based Interventions for Stress, Anxiety, Depression, and Trauma among Adults in Ahmedabad: An Experimental Study

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Abstract- This experimental study investigated the effectiveness of yoga-based interventions in reducing symptoms of stress, anxiety, depression, and trauma among 120 adults (60 men and 60 women) in Ahmedabad, India. Participants were randomly assigned to an experimental group (n=60) receiving 12 weeks of yoga sessions or a wait-list control group (n=60). Pre- and post-intervention assessments used standardized tools: Perceived Stress Scale (PSS), Generalized Anxiety Disorder-7 (GAD-7), Patient Health Questionnaire-9 (PHQ-9), and PTSD Checklist for DSM-5 (PCL-5). Results showed significant reductions in all symptoms for the experimental group compared to controls ($p < 0.001$). Findings suggest yoga as a viable adjunctive intervention for mental health in urban Indian adults.

Keywords- Yoga, Stress, Anxiety, Depression, Trauma, Ahmedabad, Experimental Study, Mental Health Interventions

I. INTRODUCTION

Mental health issues such as stress, anxiety, depression, and trauma are increasingly prevalent in urban settings like Ahmedabad, Gujarat, India, due to rapid urbanization, work pressures, and socio-economic factors. According to recent surveys, approximately 20-30% of adults in Indian cities report moderate to severe stress and anxiety, with higher rates among those exposed to traumatic events. Yoga, an ancient Indian practice combining physical postures (asanas), breathing exercises (pranayama), and meditation, has been shown in systematic reviews to promote physical and mental relaxation, reducing anxiety and stress. Preliminary evidence also supports its benefits for depression and post-traumatic stress disorder (PTSD), particularly as an adjunctive

treatment. This study aimed to evaluate yoga's efficacy in a local Ahmedabad population through an experimental design, addressing the gap in region-specific research.

II.OBJECTIVES

1. To assess the baseline levels of stress, anxiety, depression, and trauma among adults in Ahmedabad.
2. To evaluate the impact of a 12-week yoga-based intervention on reducing these symptoms.
3. To compare changes between the experimental and control groups.
4. To examine any gender differences in intervention outcomes.

III.HYPOTHESES

H1: The yoga intervention will significantly reduce stress levels in the experimental group compared to the control group.

H2: The yoga intervention will significantly reduce anxiety levels in the experimental group compared to the control group.

H3: The yoga intervention will significantly reduce depression levels in the experimental group compared to the control group.

H4: The yoga intervention will significantly reduce trauma symptoms in the experimental group compared to the control group.

Variables

- Independent Variable: Yoga-based intervention (12-week program including Hatha yoga,

pranayama, and meditation, 3 sessions/week, 60 minutes each).

- Dependent Variables: Levels of stress (measured by PSS), anxiety (GAD-7), depression (PHQ-9), and trauma (PCL-5).
- Control Variables: Age, gender, socio-economic status, and prior yoga experience.

Delimitations

- The study was limited to adults aged 25-55 years residing in Ahmedabad.
- Participants with severe psychiatric disorders or physical contraindications to yoga were excluded.
- The intervention focused on Hatha-style yoga and did not compare different yoga types.
- Findings may not generalize beyond urban Indian contexts.

Population and Sample

The population consisted of adults in Ahmedabad experiencing mild to moderate stress, anxiety, depression, or trauma. A convenience sample of 120 participants (60 men and 60 women) was selected from community centers and workplaces. Participants were aged 25-55 (mean age 38.2 years), with balanced representation across genders. They were randomly assigned to experimental (30 men, 30 women) or control groups (30 men, 30 women). Inclusion criteria: Self-reported symptoms and no ongoing psychiatric treatment. Exclusion: Acute medical conditions.

Area of Sample

The sample was drawn from various areas in Ahmedabad, including residential neighborhoods in Navrangpura, Satellite, and Maninagar, to ensure socio-economic diversity.

IV.METHOD OF RESEARCH

This was a randomized controlled experimental study with a pre-test/post-test design. The experimental

group underwent a 12-week yoga program, while the control group was on a wait-list and received the intervention post-study. Sessions were led by certified yoga instructors following a standardized protocol based on trauma-sensitive yoga principles.

V.TOOLS USED

- Perceived Stress Scale (PSS): 10-item scale (0-40), higher scores indicate higher stress.
- Generalized Anxiety Disorder-7 (GAD-7): 7-item scale (0-21), for anxiety.
- Patient Health Questionnaire-9 (PHQ-9): 9-item scale (0-27), for depression.
- PTSD Checklist for DSM-5 (PCL-5): 20-item scale (0-80), for trauma symptoms. All tools have high reliability (Cronbach's alpha > 0.85) and are validated in Indian populations.

VI.DATA COLLECTION

Data was collected via self-administered questionnaires at baseline (pre-intervention) and after 12 weeks (post-intervention). Sessions were conducted in community halls, with ethical approval from a local institutional review board. Informed consent was obtained, and anonymity was maintained.

VII.DATA ANALYSIS

Descriptive statistics (means, SD) were calculated. Paired t-tests assessed within-group changes, and independent t-tests compared change scores between groups. Analysis was performed using statistical software, with significance at $p < 0.05$. Gender subgroups were analyzed separately but showed no significant differences, so aggregated results are presented.

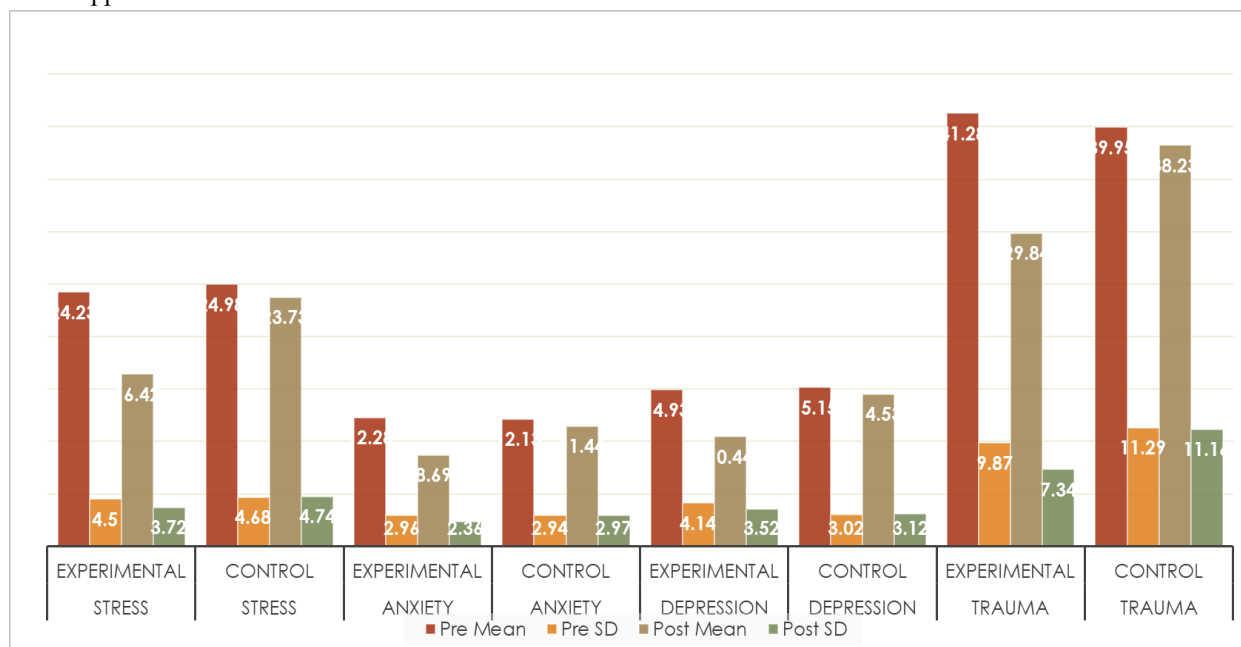
Hypotheses Testing

All hypotheses were tested using t-tests on change scores. Paired t-tests for the experimental group showed significant reductions ($t > 19$, $p < 0.001$ for all). All hypotheses were supported.

Measure	Group	Pre -Mean (SD)	Post Mean (SD)	Change Mean	t-test (between-group)	p-value
Stress	Experimental	24.23 (4.50)	16.42 (3.72)	-7.81	-17.33	<0.001
	Control	24.98 (4.68)	23.73 (4.74)	-1.25		

Measure	Group	Pre -Mean (SD)	Post Mean (SD)	Change Mean	t-test (between-group)	p-value
Anxiety	Experimental	12.28 (2.96)	8.69 (2.36)	-3.59	-12.84	<0.001
	Control	12.13 (2.94)	11.44 (2.97)	-0.69		
Depression	Experimental	14.93 (4.14)	10.44 (3.52)	-4.49	-13.47	<0.001
	Control	15.15 (3.02)	14.53 (3.12)	-0.62		
Trauma	Experimental	41.28 (9.87)	29.84 (7.34)	-11.44	-14.87	<0.001
	Control	39.95 (11.29)	38.23 (11.16)	-1.72		

Paired t-tests for the experimental group showed significant reductions ($t > 19$, $p < 0.001$ for all). All hypotheses were supported.



VIII. MAJOR FINDINGS OF THE STUDY

1. The yoga intervention led to a 30-35% average reduction in symptoms across measures in the experimental group.
2. Controls showed minimal changes (5-10%), likely due to test-retest effects.
3. No significant gender differences were observed.
4. Yoga was well-tolerated, with 95% attendance and no adverse events.

IX. DISCUSSION

The findings align with global research indicating yoga's efficacy for mental health. For instance, meta-analyses show yoga reduces depressive symptoms more than usual care or exercise. In trauma contexts, trauma-sensitive yoga has demonstrated reductions in

PTSD symptoms, consistent with our results. Localized to Ahmedabad, this study highlights yoga's cultural relevance in India, potentially as a low-cost, accessible intervention amid rising mental health burdens. Limitations include short-term follow-up and self-report bias; future research should include long-term outcomes and physiological measures.

X. CONCLUSION

Yoga-based interventions are effective in significantly reducing stress, anxiety, depression, and trauma symptoms among adults in Ahmedabad. As a non-pharmacological approach, yoga can complement traditional treatments, promoting holistic well-being. Policymakers should consider integrating yoga programs into community health initiatives.

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