



Analyzing the Impact of Integrated Yoga and Neuro-Linguistic Programming on Blood Pressure, Stress, Anxiety, and Parenting Sense of Competence in Mothers of Adolescents: A Randomized Controlled Trial

Trisha Ghosh^{1ABCDE}, Chamundeeswari Duraipandian^{1ACDE}, Govindasamy Karuppasamy^{2ACDE}, Elayaraja Masilamani^{3CDE}, Yuni Astuti^{4CDE}, Bekir Erhan Orhan^{5CDE}, Farjana Akter Bobby^{6CDE}, Kambitta Valappil Ibnu Noufal^{3CDE}, Robert Çitozi^{7ACDE} and Vlad Adrian Geantă^{8ACDE}

¹Meenakshi Academy of Higher Education and Research

²Symbiosis International (Deemed University)

³Pondicherry University

⁴Universitas Negeri Padang

⁵Istanbul Aydın University

⁶Daffodil International University

⁷Sports University of Tirana

⁸Aurel Vlaicu University of Arad

Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

Corresponding Author: Govindasamy Karuppasamy, e-mail: gowthamadnivog@gmail.com

Accepted for Publication: April 01, 2025

Published: May 30, 2025

DOI: 10.17309/tmf.v.2025.3.01

Abstract

Background. Mothers of adolescents face unique stressors that can adversely affect their mental health and family dynamics. Implementing effective interventions is essential to address maternal stress and anxiety in this population.

Objectives. This study aimed to evaluate the effects of yoga alone and yoga combined with Neuro-Linguistic Programming (NLP) on physiological state, stress and anxiety management in mothers of adolescent children.

Materials and methods. A randomized controlled trial was conducted in the Chennai Metropolitan Area, involving 90 mothers (aged 35-55 years) of adolescents (aged 13-19 years). Participants were randomly assigned to one of three groups: control (n = 30), yoga (n = 30), or yoga with NLP (n = 30). The yoga group engaged in 60-minute yoga sessions thrice weekly for 12 weeks, while the yoga with NLP group participated in the same yoga regimen plus weekly 90-minute NLP sessions. The control group received no intervention. Primary outcomes included blood pressure, heart rate, salivary cortisol, Perceived Stress Scale (PSS), Hamilton Anxiety Rating Scale (HAM-A), and Parenting Sense of Competence (PSOC) scale, measured at baseline and post-intervention.

Results. In the post-intervention period, significant between-group differences were observed across all outcomes ($p < 0.001$). The yoga with NLP group demonstrated the greatest improvements, with reductions in systolic (119.93 ± 3.87 mmHg) and diastolic blood pressure (82.93 ± 3.37 mmHg), heart rate (74.90 ± 8.86 bpm), cortisol (14.17 ± 1.91 mg/dL), PSS (13.80 ± 2.73), and HAM-A (16.67 ± 2.55) scores, alongside increased PSOC scores (79.33 ± 6.35). The yoga-only group exhibited moderate enhancements, while the control group showed no changes.

Conclusions. The findings suggest that combined yoga and NLP significantly reduced stress and anxiety, as well as improved physiological outcomes in mothers of adolescents, highlighting its potential as an effective intervention.

Keywords: yoga, neuro-linguistic programming, mother, stress, anxiety, cortisol.

© Ghosh, T., Duraipandian, C., Karuppasamy, G., Masilamani, E., Astuti, Y., Orhan, B. E., Bobby, F. A., Ibnu Noufal, K. V., Çitozi, R., & Geantă, V. A., 2025.

Introduction

Mothers of adolescents face unique stressors that can significantly impact their mental health and well-being (Ghosh et al., 2024; Sharda, 2022). Transitioning to adolescence often increases family conflict, concerns about children's safety and development, and challenges in maintaining effective communication and parenting practices (Shaw et al., 2021). These factors can contribute to elevated levels of stress and anxiety among mothers, potentially affecting both maternal health and family dynamics (Lanjekar et al., 2022). Women, in general, are at higher risk for stress-related disorders, with prevalence rates of anxiety and depression nearly twice that of men (Höglund et al., 2020). This gender disparity is particularly pronounced during reproductive years, highlighting the need for targeted interventions for women's mental health. Parenting stress, defined as the psychological distress arising from the demands of the parenting role, has been consistently associated with negative outcomes for both mothers and children (Delvecchio et al., 2020). For mothers of adolescents, this stress can be exacerbated by the increasing autonomy and risk-taking behaviours characteristic of this developmental stage (Mak et al., 2020).

Furthermore, chronic stress and anxiety in women have been linked to a range of physical health problems (Pramanik, et al., 2023; Pramanik, et al., 2023), including cardiovascular disease, immune dysfunction, and accelerated cellular ageing (Lyons et al., 2023). While various interventions have been explored to address maternal mental health, there is growing interest in holistic approaches that target both physiological (Vignesh et al., 2024) and psychological aspects of stress and anxiety. Yoga, focusing on mindfulness (Thanalakshmi et al., 2024), breathwork, and physical postures, has shown promise in reducing stress and improving emotional regulation (Hilcove et al., 2021; Ks et al., 2023). Concurrently, Neuro-Linguistic Programming (NLP), a psychotherapeutic approach emphasizing cognitive restructuring and communication skills, has demonstrated efficacy in anxiety management across diverse populations (Ybias et al., 2024). However, the potential synergistic effects of combining these modalities, particularly for mothers of adolescents, remain largely unexplored. This study aims to address this gap by investigating the combined impact of yoga and NLP on stress and anxiety management in mothers of adolescent children, compared to yoga alone and a control condition.

Materials & Methods

Study Design and Participants

This randomized controlled trial investigated the effects of yoga and combined yoga with Neuro-Linguistic Programming (NLP) on stress and anxiety management in mothers of adolescent children. The study enrolled 90 participants, aged 35-55 years, each with at least one child between 13-19 years old. Participants were randomly (See Figure: 1) assigned by lottery method to one of three groups: control, yoga, or yoga with NLP, with 30 individuals per group. The study received approval from the Ethics Committee at Meenakshi Academy of Higher Education &

Research in Tamil Nadu (Approval No. MMCH&RI IEC/PhD/02/JAN/2023)—additionally, all study procedures adhered to the most recent version of the Declaration of Helsinki.

Sample Size Calculation

The sample size was determined using G*Power software version 3.1.9.2 (Kang, 2021). The calculation was based on a one-way ANOVA with three groups, assuming a medium effect size ($f = 0.50$), an alpha level of 0.05, and a desired power of 0.80. The researchers increased the sample size by approximately 20% to account for potential dropouts and ensure sufficient power for subgroup analyses. This resulted in a total target sample of 90 participants, with 30 individuals allocated to each of the three groups (control, yoga, and yoga with NLP).

Inclusion and Exclusion Criteria

Inclusion criteria required the ability to understand and follow instructions in the local language and willingness to participate for the entire study duration. Exclusion criteria encompassed prior experience with yoga or NLP, current participation in other stress management programs, diagnosed psychiatric disorders requiring medication, and physical conditions interfering with yoga practice.

Interventions

Yoga Group: The Yoga Group participated in 60-minute sessions thrice weekly for 12 weeks. The yoga program incorporated a variety of loosening exercises, asanas, pranayama, and meditation techniques. The loosening exercises included Cat-Cow Breathing, Vaksha Sakti Vikasha, and Surya Namaskarasana from the Bihar School of Yoga tradition. This was followed by Sashangasana (Child Pose), Ustrasana, Matsyasana, Setubandhasana, Bhujangasana, and Makarasana to improve flexibility and spinal mobility. The pranayama practices focused on Shitali, Bhramari, and Nadi Suddhi, while the mental chanting of A-U-M was also included. The NLP component incorporated the Anchoring, De-Busting, and Swish techniques to enhance cognitive restructuring, stress management, and practical communication skills.

Yoga with NLP Group: Besides the yoga program described above, this group received weekly 90-minute Neuro-Linguistic Programming (NLP) sessions for 12 weeks. The NLP program focused on cognitive restructuring, stress management techniques, and communication skills to enhance parenting competence (See Table 1).

Control Group: Participants in this group received no intervention but were offered the opportunity to participate in yoga and NLP sessions after completing the study.

Procedure

Before the 12-week intervention, participants in both active groups attended two 90-minute familiarisation sessions to introduce fundamental concepts, demonstrate techniques, and address questions. All participants received structured log books to record daily stress levels, significant

Table 1. Intervention details for Yoga and NLP program

Training Component	Duration	Frequency
Loosening Exercises		
Cat-Cow Breathing	5 minutes	3 times/week
Vaksha Sakti Vikasha	5 minutes	3 times/week
Surya Namaskarasana	10 minutes	3 times/week
Asanas		
Sashangasana (Child	5 minutes	3 times/week
Ustrasana	5 minutes	3 times/week
Matsyasana	5 minutes	3 times/week
Setubandhasana	5 minutes	3 times/week
Bhujangasana	5 minutes	3 times/week
Makarasana	5 minutes	3 times/week
Pranayama]	5 minutes	3 times/week
Shitali Pranayama]	5 minutes	3 times/week
Bhramari Pranayama	5 minutes	3 times/week
Nadi Suddhi	5 minutes	
Meditation		
A-U-M Chanting	10 minutes	3 times/week
NLP Techniques		
Anchoring	30 minutes	1 times/week
De-Busting	30 minutes	1 times/week
Swish	30 minutes	1 times/week

parenting-related events, and practice techniques outside scheduled sessions. The yoga and yoga with NLP groups also logged their session attendance. These log books, collected and reviewed biweekly by the research team, served to monitor compliance, gather qualitative data, and encourage participant engagement and self-reflection throughout the study period.

Outcome Measures

Blood Pressure: Systolic and diastolic blood pressure was measured using a standard sphygmomanometer following

American Heart Association guidelines. Measurements were taken in a seated position after 5 minutes of rest (Borah et al., 2023).

Heart Rate: Heart rate was measured using a standard pulse oximeter, with readings taken after 5 minutes of rest in a seated position.

Cortisol: Salivary cortisol levels were measured using liquid chromatographic methods and mass spectrometry (LC-MSMS). Samples were collected in the morning (8-9 AM) to control for diurnal variations. LC-MSMS is 10–100 times more sensitive than RIA or IA and has a higher degree of specificity (Inder et al., 2012).

Perceived Stress Scale (PSS): This 10-item self-report questionnaire assesses the degree to which situations in one's life are appraised as stressful. Scores range from 0 to 40, with higher scores indicating higher perceived stress (Reis et al., 2010).

Hamilton Anxiety Rating Scale (HAM-A): This 14-item clinician-administered scale measures the severity of anxiety symptoms. Scores range from 0 to 56, with higher scores indicating more severe anxiety (Hamilton, 1959).

Parenting Sense of Competence (PSOC) scale: This 17-item self-report measure assessed parents' satisfaction with parenting and their self-efficacy in the parenting role. Higher scores indicate greater competence and satisfaction with parenting (Gilmore & Cuskelly, 2024).

Statistical Analysis

Demographic data were collected at baseline, and all outcome measures were assessed pre-and post-intervention by trained research assistants blinded to group allocation. Data analysis was performed using SPSS version 25.0 (Morgan et al., 2004). Descriptive statistics were calculated for all variables, with between-group differences analyzed using one-way ANOVA for continuous variables and chi-square tests for categorical variables. Paired t-tests assessed within-group changes from baseline to post-intervention. Statistical significance was set at $p < 0.05$.

Results

140 potential participants were initially screened for eligibility in this study. After applying the inclusion and

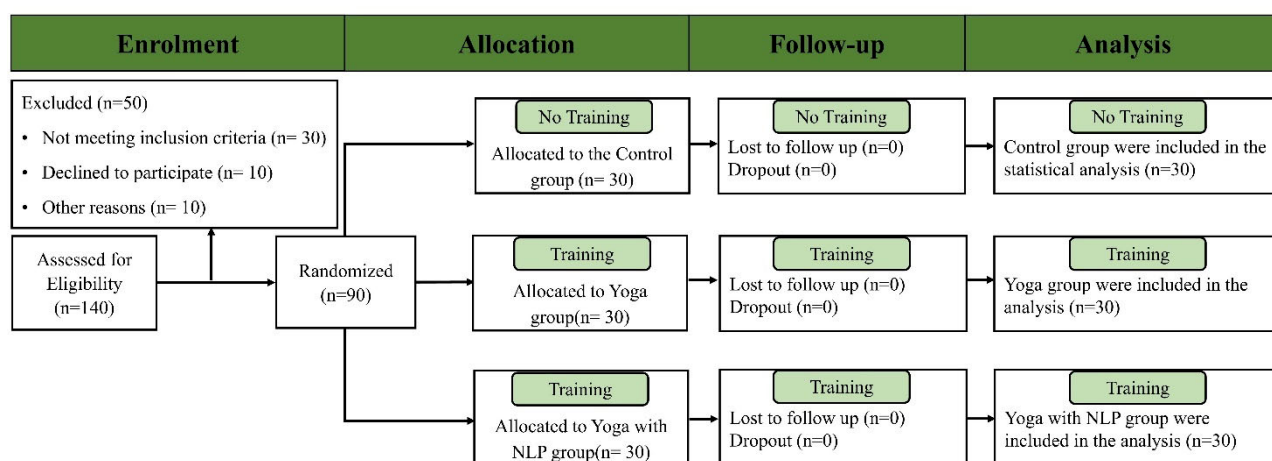


Fig. 1. Semantic representation

Table 2. Demographical details of the study participants

Characteristic	Overall, n = 90	Control, n = 30	Yoga, n = 30	Yoga with NLP, n = 30	p-value
Age (yrs)	44.38 (5.14)	44.03 (2.86)	43.90 (3.01)	45.20 (7.92)	>0.9
Height (cm)	153.41 (4.03)	154.03 (4.05)	153.00 (3.84)	153.20 (4.26)	0.5
Weight(kg)	68.58 (8.73)	69.54 (10.13)	67.46 (7.90)	68.73 (8.15)	0.8
Qualification					0.9
Degree and Above	54 (60%)	18 (60%)	18 (60%)	18 (60%)	
Graduate	33 (37%)	12 (40%)	11 (37%)	10 (33%)	
HSC	3 (3.3%)	0 (0%)	1 (3.3%)	2 (6.7%)	
Occupation					>0.9
Housewife	9 (10%)	2 (6.7%)	4 (13%)	3 (10%)	
Private sector	52 (58%)	19 (63%)	16 (53%)	17 (57%)	
Public sector	10 (11%)	3 (10%)	3 (10%)	4 (13%)	
Self Employed	19 (21%)	6 (20%)	7 (23%)	6 (20%)	
Annual Income					0.5
> 7 laks	18 (20%)	3 (10%)	7 (23%)	8 (27%)	
1-3 laks	15 (17%)	6 (20%)	6 (20%)	3 (10%)	
3-7 laks	47 (52%)	19 (63%)	13 (43%)	15 (50%)	
No income	10 (11%)	2 (6.7%)	4 (13%)	4 (13%)	
Marital Status					0.7
Divorced	7 (7.8%)	2 (6.7%)	2 (6.7%)	3 (10%)	
Married	80 (89%)	28 (93%)	27 (90%)	25 (83%)	
Widow	3 (3.3%)	0 (0%)	1 (3.3%)	2 (6.7%)	
Family status					0.8
Joint	13 (14%)	5 (17%)	3 (10%)	5 (17%)	
Nuclear	77 (86%)	25 (83%)	27 (90%)	25 (83%)	
No Children					0.15
One child	66 (73%)	25 (83%)	23 (77%)	18 (60%)	
Three child	2 (2.2%)	1 (3.3%)	0 (0%)	1 (3.3%)	
Two child	22 (24%)	4 (13%)	7 (23%)	11 (37%)	
No boys					0.3
No boy	28 (31%)	11 (37%)	11 (37%)	6 (20%)	
One boy	57 (63%)	19 (63%)	17 (57%)	21 (70%)	
Two boy	5 (5.6%)	0 (0%)	2 (6.7%)	3 (10%)	
No girls					0.8
No girls	48 (53%)	16 (53%)	17 (57%)	15 (50%)	
One girl	37 (41%)	11 (37%)	12 (40%)	14 (47%)	
Two girls	5 (5.6%)	3 (10%)	1 (3.3%)	1 (3.3%)	
Children Home					0.8
Home	67 (74%)	21 (70%)	23 (77%)	23 (77%)	

exclusion criteria, 90 individuals met the requirements and were enrolled in the trial (see Figure 1). specifically, one participant dropped out from the control group, two participants discontinued from the yoga group, and three participants withdrew from the yoga with NLP group. Despite these dropouts, the overall retention rate remained high, with 93.3% of participants completing the entire study

protocol. The final analysis included 29 participants in the control group, 28 in the yoga group, and 27 in the yoga with NLP group, for 84 participants who completed the entire study. The mean age of participants was 44.38 ± 5.14 years, with no significant differences (See Table 2) between groups in demographic characteristics such as age, height, weight, qualification, occupation, annual income, marital status,

Table 3. Comparison of baseline outcome parameters between the groups

Characteristic	Overall, n = 90	Control, n = 30	Yoga, n = 30	Yoga with NLP, n = 30	p-value
SBP (mmHg)	136.64 (8.76)	134.50 (6.66)	138.07 (6.91)	137.37 (11.65)	0.2
DBP_(mmHg)	97.91 (5.70)	97.70 (6.37)	97.50 (5.11)	98.53 (5.68)	0.8
Heart rate (bpm)	97.43 (8.75)	94.17 (6.77)	96.07 (9.07)	102.07 (8.48)	0.001
Cortisol (mg/dl)	16.99 (1.11)	17.16 (1.02)	16.98 (0.90)	16.82 (1.37)	0.6
PSS	34.72 (4.16)	35.27 (4.33)	34.77 (3.85)	34.13 (4.35)	0.5
HAM-A	27.92 (3.25)	27.30 (3.72)	27.77 (2.96)	28.70 (2.96)	0.3
PSOC	42.43 (4.87)	43.17 (5.75)	42.93 (4.19)	41.20 (4.44)	0.3

SBP: systolic blood pressure; DBP: diastolic blood pressure; PSS: perceived stress scale; HAM-A: Hamilton Anxiety Rating Scale; PSOC: Parenting Sense of Competence

Table 4. Post-intervention comparison of the outcome parameters between the groups

Characteristic	Overall, n = 90	Control, n = 30	Yoga, n = 30	Yoga with NLP, n = 30	p-value
SBP (mmHg)	128.59 (8.58)	137.20 (6.00)	128.63 (4.54)	119.93 (3.87)	<0.001
DBP_(mmHg)	89.24 (8.34)	97.87 (7.61)	86.93 (4.55)	82.93 (3.37)	<0.001
Heart rate (bpm)	81.82 (13.08)	92.83 (6.08)	77.73 (14.74)	74.90 (8.86)	<0.001
Cortisol (mg/dl)	14.97 (1.93)	16.43 (1.38)	14.31 (1.58)	14.17 (1.91)	<0.001
PSS	24.13 (9.25)	34.83 (3.82)	23.77 (3.37)	13.80 (2.73)	<0.001
HAM-A	22.22 (5.78)	28.30 (3.69)	21.70 (3.46)	16.67 (2.55)	<0.001
PSOC	61.51 (16.23)	42.87 (6.08)	62.33 (6.46)	79.33 (6.35)	<0.001

SBP: systolic blood pressure; DBP: diastolic blood pressure; PSS: perceived stress scale; HAM-A: Hamilton Anxiety Rating Scale; PSOC: Parenting Sense of Competence

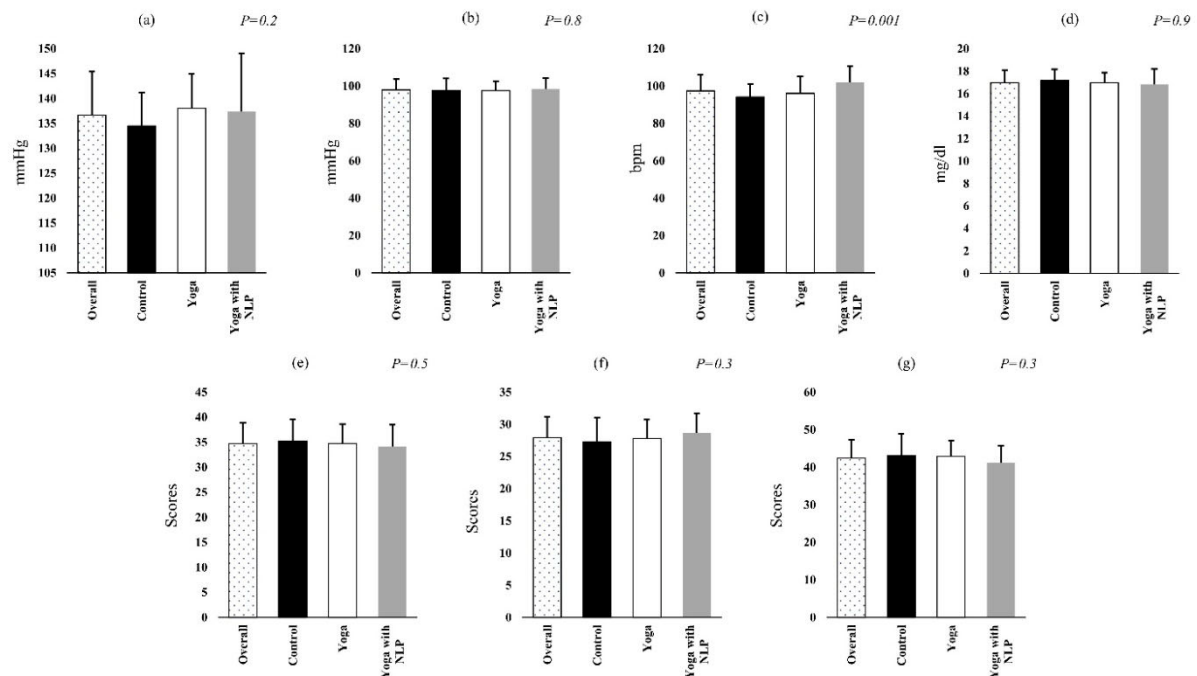


Fig. 2. Baseline comparison on (a) SBP, (b) DBP, (c) Heart rate, (d) Cortisol, (e) PSS, (f) HAM-A, (g) PSOC outcome parameters

family status, or number of children (all $p > 0.05$). Most participants (60 %) had a degree or higher education, worked in the private sector (58%), earned 3-7 lakhs annually (52%),

were married (89 %), and lived in nuclear families (86 %). The majority had one child (73 %), with 63 % having one boy and 41 % having one girl.

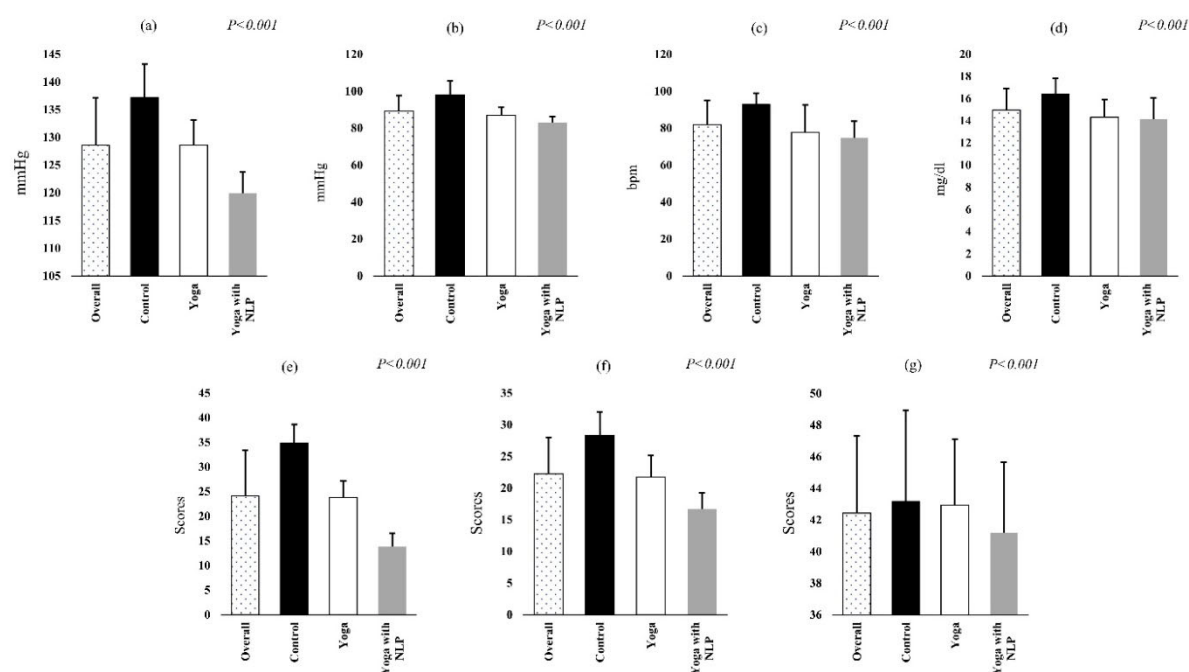


Fig. 3. Post-intervention comparison on (a) SBP, (b) DBP, (c) Heart rate, (d) Cortisol, (e) PSS, (f) HAM-A, (g) PSOC outcome parameters

At baseline, there were no significant (see Table: 3) differences between groups in systolic blood pressure (SBP), diastolic blood pressure (DBP), cortisol levels, Perceived Stress Scale (PSS) scores, Hamilton Anxiety Rating Scale (HAM-A) scores, or Parenting Sense of Competence (PSOC) scores (all $p > 0.05$). However, a significant difference in heart rate was observed ($p = 0.001$), with the yoga with NLP group showing a higher baseline rate (102.07 ± 8.48 bpm) compared to the control (94.17 ± 6.77 bpm) and yoga-only (96.07 ± 9.07 bpm) groups. Figure 2 displays a graphical representation of the baseline comparison.

Post-intervention measurements (see Table 4) revealed significant differences between groups for all outcomes (all $p < 0.001$). The yoga with NLP group demonstrated the most substantial improvements, followed by the yoga-only group, while the control group showed little to no change. Specifically, the yoga with NLP group exhibited the lowest blood pressure (SBP: 119.93 ± 3.87 mmHg; DBP: 82.93 ± 3.37 mmHg), heart rate (74.90 ± 8.86 bpm), and cortisol levels (14.17 ± 1.91 mg/dl). This group also reported the lowest stress (PSS: 13.80 ± 2.73) and anxiety (HAM-A: 16.67 ± 2.55) scores, along with the highest parenting sense of competence (PSOC: 79.33 ± 6.35). The yoga-only group showed intermediate improvements, while the control group maintained elevated levels similar to baseline measurements. Figure 3 displays a graphical representation of the post intervention comparison.

Discussion

The present study demonstrated significant improvements in physiological and psychological measures of stress and anxiety among mothers of adolescent children following yoga and combined yoga with NLP interventions. The yoga with NLP group showed the most substantial benefits across all outcome measures, including reduced blood pres-

sure, heart rate, cortisol levels, perceived stress, anxiety, and increased parenting sense of competence. The yoga-only group also exhibited improvements, albeit to a lesser extent, while the control group maintained baseline levels.

A quasi-experimental study examined the effects of hatha yoga on stress, anxiety, and depression in 52 Iranian women (mean age 33.5 ± 6.5 years). Participants completed a 4-week intervention of thrice-weekly 60-70-minute yoga sessions. Using the DASS-21 scale, significant reductions in depression, anxiety, and stress were observed post-intervention ($p < 0.001$). The study concludes that yoga can effectively reduce these psychological symptoms and maybe a complementary treatment approach (Khunti et al., 2023). Another pilot study examined the effectiveness of an 8-week mindful parenting intervention (MPI) for 21 parents of children aged 3-7 years with anxiety disorders, and the findings showed that there were significant increases in mindful parenting and reductions in dysfunctional parent-child interactions ($p < 0.05$) (Farley et al., 2023). The present study extends these findings by demonstrating the enhanced benefits of combining yoga with NLP techniques.

A systematic review found evidence that NLP interventions can effectively reduce anxiety across various populations and settings (Nompo et al., 2021). Several studies demonstrated that NLP techniques like reframing, anchoring, rapport building, and modelling helped decrease anxiety symptoms and promote positive behavioural changes (Kotera et al., 2019). The NLP approaches were applied through average multi-session training programs lasting 2-12 weeks. Common elements included identifying sensory preferences, establishing rapport, reframing negative thoughts, and practising new cognitive and communication strategies. The benefits extended beyond merely reducing anxiety, encompassing enhancements in self-confidence, communication skills, and overall mental health (Nompo et al., 2021; Shirazi & Kahrzei, 2022).

The synergistic effect of yoga and NLP may be attributed to their complementary mechanisms. Yoga's focus on breath control, mindfulness, and physical postures likely contributes to reduced physiological arousal and improved emotional regulation (Padmavathi et al., 2023). NLP techniques, on the other hand, may enhance cognitive restructuring and communication skills, thereby addressing the psychological aspects of stress and anxiety more directly (Mehdi et al., 2022). The combined approach offers a more comprehensive strategy for managing the multifaceted challenges mothers of adolescents face.

This study's strengths include its randomized controlled design, physiological and psychological outcome measures, and the comparison of yoga alone versus yoga with NLP. However, limitations should be noted. The sample size was relatively small, and the study was conducted in a single geographic location, potentially limiting generalizability. Additionally, the long-term sustainability of the observed benefits was not assessed, as follow-up measurements beyond the immediate post-intervention period were not conducted.

Conclusions

In conclusion, this study provides evidence for the efficacy of combined yoga and NLP interventions in reducing stress and anxiety among mothers of adolescent children. The findings suggest that this integrated approach may be more effective than yoga alone in improving physiological and psychological well-being. Future research should explore the long-term effects of these interventions, investigate potential mechanisms of action through neuroimaging or biomarker studies, and examine the impact on family dynamics and adolescent outcomes. Given the promising results, healthcare providers and community organizations may consider combining yoga and NLP programs as a holistic approach to supporting maternal mental health and family well-being.

Conflict of Interest

The authors declare that they have no conflicts interests.

References

- Ghosh, T., Duraipandian, C., Joseph, S., Kumasi, B., Salvi, N. M., Elayaraja, M., Astuti, Y., Orhan, B. E., Karmakar, D., & Govindasamy, K. (2024). Effects of Yoga and Combined Yoga with Neuro-Linguistic Programming on Psychological Management in Mothers of Adolescents: A Randomized Controlled Trial. *Sport Mont*, 22(3), 99-105. <https://doi.org/10.26773/smj.241016>
- Sharda, E. (2022). Parenting stress and well-being among foster parents: The moderating effect of social support. *Child and Adolescent Social Work Journal*, 39(5), 547-559. <https://doi.org/10.1007/s10560-022-00836-6>
- Shaw, K. L., Baldwin, L., & Heath, G. (2021). 'A confident parent breeds a confident child': understanding the experience and needs of parents whose children will transition from paediatric to adult care. *Journal of Child Health Care*, 25(2), 305-319. <https://doi.org/10.1177/1367493520936422>
- Lanjekar, P. D., Joshi, S. H., Lanjekar, P. D., & Wagh, V. (2022). The effect of parenting and the parent-Child relationship on a Child's cognitive development: a literature review. *Cureus*, 14(10). <https://doi.org/10.7759/cureus.30574>
- Höglund, P., Hakelind, C., & Nordin, S. (2020). Severity and prevalence of various types of mental ill-health in a general adult population: age and sex differences. *BMC Psychiatry*, 20(1), 209. <https://doi.org/10.1186/s12888-020-02557-5>
- Delvecchio, E., Germani, A., Raspa, V., Lis, A., & Mazzeschi, C. (2020). Parenting styles and child's well-being: The mediating role of the perceived parental stress. *Europe's Journal of Psychology*, 16(3), 514. <https://doi.org/10.5964/ejop.v16i3.2013>
- Mak, M. C. K., Yin, L., Li, M., Cheung, R. Y.-h., & Oon, P.-T. (2020). The relation between parenting stress and child behavior problems: Negative parenting styles as mediator. *Journal of Child and Family Studies*, 29, 2993-3003. <https://doi.org/10.1007/s10826-020-01785-3>
- Pramanik, M., Rajkumar, N. C., Elayaraja, M., Gogoi, H., & Govindasamy, K. (2023). Effects of a 12-Week Yoga Training Intervention on Blood Pressure and Body Composition in Obese Female Adolescents: A Randomized Controlled Pilot Study. *Physical Rehabilitation and Recreational Health Technologies*, 8(3), 162-171. [https://doi.org/10.15391/prrht.2023-8\(3\).05](https://doi.org/10.15391/prrht.2023-8(3).05)
- Pramanik, M., Rajkumar, N. C., Elayaraja, M., Gogoi, H., & Govindasamy, K. (2023). Exploring the Effects of Yogic Practice and Diet Intervention on Body Composition in Obese Female Adolescents. *Universal Journal of Public Health*, 11(5), 627-635. <https://doi.org/10.13189/ujph.2023.110511>
- Lyons, C. E., Razzoli, M., & Bartolomucci, A. (2023). The impact of life stress on hallmarks of aging and accelerated senescence: Connections in sickness and in health. *Neuroscience and Biobehavioral Reviews*, 153, 105359. <https://doi.org/10.1016/j.neubiorev.2023.105359>
- Vignesh, C., Chelliah Jesus Rajkumar, N., Elayaraja, M., Gogoi, H., & Govindasamy, K. (2024). Effect of Selected Yoga Interventions on Psycho-Physiological Function in IT Professionals with Chronic Back Pain—A Randomized Controlled Trial. *Physical rehabilitation and recreational health technologies*, 9(4), 256-268. [https://doi.org/10.15391/prrht.2024-9\(4\).06](https://doi.org/10.15391/prrht.2024-9(4).06)
- Thanalakshmi, J., Maheshkumar, K., Kavia, K., Pramanik, M., & Govindasamy, K. (2024). OM Chanting Reduces Psychological Distress Level in Office Workers During Covid 19 Pandemic. *Physical Rehabilitation and Recreational Health Technologies*, 9(1), 20-24. [https://doi.org/10.15391/prrht.2024-9\(1\).03](https://doi.org/10.15391/prrht.2024-9(1).03)
- Hilcove, K., Marceau, C., Thekdi, P., Larkey, L., Brewer, M. A., & Jones, K. (2021). Holistic nursing in practice: mindfulness-based yoga as an intervention to manage stress and burnout. *Journal of Holistic Nursing*, 39(1), 29-42. <https://doi.org/10.1177/0898010120921587>
- Ks D., K. M., Silambanan, S., Kantipudi, S. J., & Sathianathan, R. (2023). Development and validation of yoga protocol for patients with depression. *Annals of neurosciences*, 30(2), 96-99. <https://doi.org/10.1177/09727531221127766>
- Ybias, C., Ortibano, M., & Madrigal, D. (2024). The Effect of Integrated-Neuro-Linguistic Programming as Supplementary Intervention for Individuals with Symptoms of Depression. *Technium Social Sciences Journal*, 60, 122-155. <https://doi.org/10.47577/tssj.v60i1.11551>
- Kang, H. (2021). Sample size determination and power analysis using the G* Power software. *Journal of Educational Evaluation for Health Professions*, 18, 1-12. <https://doi.org/10.3352/jeehp.2021.18.17>

- Borah, P., Elayaraja, M., Ram, J., Pramanik, M., Minu, T., Eichir, L., Modi, Z. A., Gogoi, L., & Govindasamy, K. (2023). Evaluating the Impact of a 12-Week Yoga Intervention on Cardiac Autonomic Function and Blood Pressure in Young Indian Adults with Primary Hypertension: A Randomized Controlled Study. *Slobozhanskyi Herald of Science and Sport*, 27(4), 193-205. <https://doi.org/10.15391/sns.v.2023-4.004>
- Inder, W. J., Dimeski, G., & Russell, A. (2012). Measurement of salivary cortisol in 2012—laboratory techniques and clinical indications. *Clinical Endocrinology*, 77(5), 645-651. <https://doi.org/10.1111/j.1365-2265.2012.04508.x>
- Reis, R. S., Hino, A. A., & Añez, C. R. (2010). Perceived stress scale. *J. health Psychol*, 15(1), 107-114. <https://doi.org/10.1177/1359105309346343>
- Hamilton, M. (1959). Hamilton anxiety rating scale (HAM-A). *Journal of Medicine*, 61(4), 81-82. <https://doi.org/10.1111/j.2044-8341.1959.tb00467.x>
- Gilmore, L., & Cuskelly, M. (2024). The parenting sense of competence scale: updating a classic. *Child: Care, Health and Development*, 50(1), e13173. <https://doi.org/10.1111/cch.13173>
- Morgan, G. A., Leech, N. L., Gloeckner, G. W., & Barrett, K. C. (2004). *SPSS for introductory statistics: Use and interpretation*. Psychology Press. <https://doi.org/10.4324/9781410610539>
- Khunti, K., Boniface, S., Norris, E., De Oliveira, C. M., & Shelton, N. (2023). The effects of yoga on mental health in school-aged children: A Systematic Review and Narrative Synthesis of Randomised Control Trials. *Clinical Child Psychology and Psychiatry*, 28(3), 1217-1238. <https://doi.org/10.1177/13591045221136016>
- Farley, R., de Diaz, N. A. N., Emerson, L. M., Simcock, G., Donovan, C., & Farrell, L. J. (2023). Mindful parenting group intervention for parents of children with anxiety disorders. *Child Psychiatry and Human Development*, 1-12. <https://doi.org/10.1007/s10578-023-01492-2>
- Nompo, R. S., Pragholaipati, A., & Thome, A. L. (2021). Effect of neuro-linguistic programming (NLP) on anxiety: a systematic literature review. *KnE Life Sciences*, 496-507. <https://doi.org/10.18502/cls.v6i1.8640>
- Kotera, Y., Sheffield, D., & Van Gordon, W. (2019). The applications of neuro-linguistic programming in organizational settings: A systematic review of psychological outcomes. *Human Resource Development Quarterly*, 30(1), 101-116. <https://doi.org/10.1002/hrdq.21334>
- Shirazi, M., & Kahrazei, F. (2022). Investigating the effect of transcranial direct electrical stimulation (tDCS) and neuro-verbal programming (NLP) on reducing women's depression, anxiety and stress. *Applied Family Therapy Journal (AFTJ)*, 3(2), 586-597. <https://doi.org/10.61838/kman.aftj.3.2.31>
- Padmavathi, R., Kumar, A. P., Dhamodhini, K. S., Venugopal, V., Silambanan, S., Maheshkumar, K., & Shah, P. (2023). Role of yoga in stress management and implications in major depression disorder. *Journal of Ayurveda and Integrative Medicine*, 14(5), 100767. <https://doi.org/10.1016/j.jaim.2023.100767>
- Mehdi, M., Ali, A., & Abbasi, A. (2022). A Critical Analysis Of The Effects Of Neuro-Linguistic Programming On The Human Behaviour. *Pakistan Journal of Social Research*, 4(1), 108-118. <https://doi.org/10.52567/pjsr.v4i1.350>

Аналіз впливу інтегрованої практики занять йогою та нейролінгвістичного програмування на показники артеріального тиску, стресу, тривожності та відчуття батьківської компетентності у матерів дітей підліткового віку: Рандомізоване контрольоване дослідження

Тріша Гош^{1ACDE}, Чамундешварі Дурайпандіан^{1ACDE}, Говіндасамі Каруппасамі^{2ACDE}, Ілаяраджа Масіламані^{3CDE}, Юні Астуті^{4CDE}, Бекір Ерхан Орхан^{5CDE}, Фарджана Актор Бобі^{6CDE}, Камбіта Валаппіл Ібн Нуфал^{3CDE}, Роберт Сітоджі^{7ACDE}, Влад Адріан Джіанте^{8ACDE}

¹Академія вищої освіти та досліджень Мінакші

²Міжнародний університет Симбіозис

³Університет Пондічеррі

⁴Державний університет Паданг

⁵Стамбульський університет Айдин

⁶Міжнародний університет Даффоділ

⁷Спортивний університет Тирани

⁸Університет Аурела Влайку в Арадї

Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; Е – збір коштів

Реферат. Стаття: 9 с., 4 табл., 3 рис., 29 джерел.

Історія питання. Матері підлітків стикаються з особливими стресовими факторами, які можуть негативно впливати на їхнє психічне здоров'я та сімейну динаміку. Впровадження ефективних інтервенцій має важливе значення для подолання материнського стресу та тривожності у цій категорії населення.

Мета дослідження. Мета цього дослідження полягала в оцінюванні впливу занять йогою як самостійної практики та поєднання йоги з нейролінгвістичним програмуванням (НЛП) на процес регулювання фізіологічного стану, рівнів стресу і тривожності у матерів дітей підліткового віку.

Матеріали та методи. Рандомізоване контрольоване дослідження проведено у метрополійній території Ченнай із залученням 90 матерів (віком 35-55 років), які виховують підлітків (віком 13-19 років). Учасників було розподілено за методом рандомізації до однієї з трьох груп: контрольної ($n = 30$), групи, що займалася йогою ($n = 30$), або групи, що поєднувала йогу з НЛП ($n = 30$). Група з йоги займалася 60-хвилинними заняттями тричі на тиждень впродовж 12 тижнів, тоді як група, що практикувала йогу з НЛП, дотримувалася аналогічного режиму йоги та щотижневих 90-хвилинних сеансів НЛП. У контрольній групі не проводилося жодних інтервенцій. Первинні результати включали вимірювання артеріального тиску, частоти серцевих скорочень, рівня кортизолу в слині, показників шкали сприйнятого стресу (Perceived Stress Scale, PSS), шкали Гамільтона для оцінки рівня тривожності (Hamilton Anxiety Rating Scale, HAM-A) і шкали відчуття батьківської компетентності (Parenting Sense of Competence, PSOC) на початковому етапі та після завершення інтервенції.

Результати. У постінтервенційному періоді спостерігалися достовірні міжгрупові відмінності за всіма показниками ($p < 0,001$). Група, яка займалася йогою з НЛП, продемонструвала максимальне поліпшення показників: зниження систолічного ($119,93 \pm 3,87$ мм рт.ст.) і діастолічного артеріального тиску ($82,93 \pm 3,37$ мм рт.ст.), частоти серцевих скорочень ($74,90 \pm 8,86$ уд./хв.), рівня кортизолу ($14,17 \pm 1,91$ мг/дл), шкали PSS ($13,80 \pm 2,73$) і шкали HAM-A ($16,67 \pm 2,55$), а також підвищення результатів за шкалою PSOC ($79,33 \pm 6,35$). У групі, яка практикувала лише заняття йогою, спостерігалось помірне покращення, тоді як у контрольній групі змін не зафіксовано.

Висновки. Отримані дані свідчать про те, що комбінована практика, яка поєднує в собі заняття йогою та НЛП, сприяє значному зменшенню рівня стресу та тривожності, а також покращує фізіологічні показники у матерів підлітків, що підкреслює потенціал цієї методики як ефективної інтервенції.

Ключові слова: йога, нейролінгвістичне програмування, мати, стрес, тривожність, кортизол.

Information about the authors:

Ghosh, Trisha: trishaghosh9848@gmail.com; <https://orcid.org/0009-0005-5474-2602>; Faculty of Yoga Science and Therapy, Meenakshi Academy of Higher Education and Research, Chennai, Tamil Nadu, India.

Duraipandian, Chamundeeswari: principalpharmacy@maher.ac.in; <https://orcid.org/0000-0001-9333-5325>; Meenakshi Faculty of Pharmacy, Meenakshi Academy of Higher Education and Research, Thandalam, Tamil Nadu, India.

Karuppasamy, Govindasamy: gowthamadvivog@gmail.com; <https://orcid.org/0000-0002-3019-5545>; Department of Sports, Recreation and Wellness, Symbiosis International (Deemed University), Hyderabad Campus, Modallaguda, Nandigama-509217, Rangareddy Dist, Hyderabad, Telangana, India.

Masilamani, Elayaraja: elaya.cricket@gmail.com; <https://orcid.org/0000-0002-0022-961X>; Department of Physical Education and Sports, Pondicherry University, Puducherry, India.

Astuti, Yuni: yuniastuti@fik.unp.ac.id; <https://orcid.org/0000-0001-6430-2938>; Universitas Negeri Padang, Faculty of Sports Sciences, West Sumatra, Indonesia

Orhan, Bekir Erhan: bekirerhanorhan@aydin.edu.tr; <https://orcid.org/0000-0002-3149-6630>; Faculty of Sports Sciences, Istanbul Aydin University, Istanbul, Türkiye.

Boby, Farjana Akter: boby.pess@diu.edu.bd; <https://orcid.org/0000-0003-3168-6888>; Department of Physical Education and Sports Science, Faculty of Health and Life Science, Daffodil International University, Dhaka, Bangladesh.

Ibnu Noufal, Kambitta Valappil: noufalibnukv70@gmail.com; <https://orcid.org/0009-0006-6426-8809>; Department of Physical Education and Sports, Pondicherry University, Puducherry, India.

Çitozi, Robert: rcitozi@ust.edu.al; <https://orcid.org/0000-0003-3707-222X>; Faculty of Physical Activity and Recreation, Sports University of Tirana, Tirana, Albania.

Geantă, Vlad Adrian: vladu.geanta@gmail.com; <https://orcid.org/0000-0002-8488-1698>; Aurel Vlaicu University of Arad, Faculty of Physical Education and Sport, Romania.

Cite this article as: Ghosh, T., Duraipandian, C., Karuppasamy, G., Masilamani, E., Astuti, Y., Orhan, B. E., Boby, F. A., Ibnu Noufal, K. V., Çitozi, R., & Geantă, V. A. (2025). Analyzing the Impact of Integrated Yoga and Neuro-Linguistic Programming on Blood Pressure, Stress, Anxiety, and Parenting Sense of Competence in Mothers of Adolescents: A Randomized Controlled Trial. *Physical Education Theory and Methodology*, 25(3), 477-485. <https://doi.org/10.17309/tmf.v.2025.3.01>

Received: 11.01.2025. Accepted: 01.04.2025. Published: 30.05.2025

This work is licensed under a Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0>)