

Comparative Outcomes of Cognitive Thought Record, Shiras-Pada Abhyanga, and Nadishuddhi-Bhramari Pranayama in Anxiety Disorders: A Three-Group Study

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Abstract: Anxiety disorders are associated with emotional distress, impaired sleep, and reduced psychological well-being. This study aimed to compare the therapeutic outcomes of Cognitive Thought Record (CTR) combined with Shiras-Pada Abhyanga, CTR combined with Nadishuddhi-Bhramari Pranayama, and Shiras-Pada Abhyanga combined with Nadishuddhi-Bhramari Pranayama in individuals with anxiety symptoms. A three-group comparative study was conducted among 45 participants, with 15 participants in each group. Group A received CTR and Shiras-Pada Abhyanga, Group B received CTR and Nadishuddhi-Bhramari Pranayama, and Group C received Shiras-Pada Abhyanga and Nadishuddhi-Bhramari Pranayama. Outcomes were assessed at baseline, Day 29, and Day 45 using the Beck Anxiety Inventory (BAI), Pittsburgh Sleep Quality Index (PSQI), and WHO-5 Well-Being Index. All three groups demonstrated improvements in anxiety symptoms, sleep quality, and psychological well-being. Group C showed the lowest mean anxiety scores at Day 29 and Day 45 (BAI: 9.47 at both assessments), improved sleep quality scores (PSQI: 4.07 and 4.53, respectively), and higher well-being scores (WHO-5: 15.27 and 15.07, respectively). Between-group differences were statistically significant for anxiety, sleep quality, and psychological well-being at both post-intervention assessments ($p < .05$). These findings suggest that the combination of Shiras-Pada Abhyanga and Nadishuddhi-Bhramari Pranayama may be beneficial in reducing anxiety symptoms and improving sleep quality and psychological well-being. However, further studies with larger samples and verification of statistical results are required to confirm these findings.

Keywords: Anxiety disorders, Cognitive Thought Record, Shiras-Pada Abhyanga, Nadishuddhi-Bhramari Pranayama, sleep quality, psychological well-being

1. Introduction

Anxiety Disorders

Anxiety is a normal emotional response to uncertainty or perceived threats; however, when fear and worry become excessive, persistent, difficult to control, and interfere with daily functioning, they may indicate an anxiety disorder (American Psychiatric Association, 2022, 1). Anxiety disorders are among the most common mental health conditions globally, affecting approximately 301 million people in 2019, including 58 million children and adolescents (World Health Organization [WHO], 2023, 2). Major types include generalized anxiety disorder, panic disorder, social anxiety disorder, specific phobia, agoraphobia, and separation anxiety disorder. Common symptoms include restlessness, irritability, muscle tension, palpitations, sleep disturbances, difficulty concentrating, and avoidance of anxiety-provoking situations. These disorders develop through an interaction of biological, psychological, and environmental factors, including genetic vulnerability, negative thinking patterns, traumatic experiences, and prolonged stress. Anxiety can adversely affect emotional well-being, relationships, academic performance, occupational functioning, and quality of life, and may co-occur with depression and substance-use disorders (Craske & Stein, 2016, 3). Evidence-based treatments include cognitive behavioural therapy (CBT), other psychological interventions, and medication when clinically indicated. CBT helps individuals identify unhelpful automatic thoughts, evaluate supporting and opposing evidence, and develop balanced interpretations, providing a rationale for investigating Cognitive Thought Record

alongside Shiras-Pada Abhyanga and Nadishuddhi-Bhramari Pranayama as complementary interventions for anxiety management (WHO, 2023).

Psychology Therapy- Cognitive Thought Record

Cognitive Thought Record (CTR), a structured technique used in Cognitive Behavioural Therapy (CBT), helps individuals identify, evaluate, and modify negative automatic thoughts that contribute to emotional distress. Based on Beck's cognitive model, it proposes that an individual's interpretation of an event influences their emotions and behaviour (Beck, 1976, 4) & (Beck et al., 1979, 5). The technique involves recording a triggering situation, identifying and rating emotions, recognizing automatic thoughts, examining evidence supporting and contradicting those thoughts, developing a balanced alternative interpretation, and reassessing emotional intensity. Cognitive restructuring encourages realistic thinking rather than forced positive thinking (Clark, 2013, 6).

Research supports CBT as an evidence-based treatment for anxiety and other psychological disorders (Butler et al., 2005, 7) & (Hofmann et al., 2012, 8). Furthermore, research examining cognitive restructuring suggests that changes in maladaptive thinking may contribute to psychotherapy outcomes, although the independent effectiveness of a specific thought-record format requires further investigation (Ezawa & Hollon, 2023, 9). In anxiety disorders, CTR may help individuals address the catastrophic predictions, overestimating the danger, fear of failure, and intolerance of uncertainty, thereby promoting balanced interpretations and

adaptive coping. Therefore, investigating CTR as a structured intervention may help clarify its contribution to anxiety management alongside Shiras–Pada Abhyanga and Nadishuddhi–Bhramari Pranayama.

Ayurveda Therapy - Shiras & Pada Abhyanga:

Ayurveda is a traditional Indian system of medicine that promotes health through the balance of bodily functions, mental well-being, lifestyle practices, and therapeutic procedures (Charaka, 2011, 10) & (Murthy, 2013, 11). Abhyanga, the application of oil with gentle massage, is described in classical Ayurvedic texts as part of Dinacharya (daily regimen) and is traditionally associated with nourishment, physical comfort, and Vata management (Sharma & Dash, 2013, 12). Shiras Abhyanga involves oil application and gentle massage of the head and scalp, while Pada Abhyanga involves oil application and massage of the feet. The Ashtanga Hridaya, with Arunadatta's Sarvāṅgasundarā commentary, discusses Abhyanga at daily or one-, two-, or three-day intervals, providing a classical basis for flexible practice frequency. Traditionally, Shiras Abhyanga is associated with relaxation and head comfort, whereas Pada Abhyanga is associated with relief from foot dryness and fatigue and support for comfortable movement and sleep. These practices may be investigated as complementary approaches to relaxation and well-being; however, their specific effectiveness in treating anxiety requires further clinical evidence. In the present study, Shiras–Pada Abhyanga is examined alongside Cognitive Thought Record and Nadishuddhi–Bhramari Pranayama as part of an integrated approach to anxiety management.

Yoga Therapy- Nadi Shuddhi & Bhramari Pranayama

Yoga is a traditional Indian system that aims to promote harmony between the body, mind, and consciousness. Patañjali defines Yoga as chitta-vritti-nirodha, or the regulation of mental fluctuations, and describes Pranayama as 4th limb of Ashtanga Yoga (Patañjali, 2009, Yoga Sutras: 1.2, 2.29, 13). Pranayama involves the conscious regulation of breathing and is traditionally associated with mental steadiness and self-regulation. The Haṭha Yoga Pradīpikā describes Nadi Shuddhi (Nadi Shodhana) Pranayama, a technique involving alternate-nostril breathing, and Bhramari Pranayama, which involves producing a gentle humming sound during exhalation (Svātmārāma, 1998, 2.7–10, 2.68, 14). Modern research has investigated alternate-nostril breathing for its potential effects on autonomic function and cognitive performance, although variations in study methods and limited clinical evidence warrant cautious interpretation (Ghiya, 2017, 15). Bhramari combines controlled breathing, humming, and focused attention, which may support relaxation and awareness of breathing. These practices may therefore be investigated as complementary approaches to anxiety management; however, their specific therapeutic effects require further clinical evaluation. In the present study, Nadishuddhi–Bhramari Pranayama is examined alongside Cognitive Thought Record and Shiras–Pada Abhyanga to evaluate its contribution to anxiety reduction.

2. Methods

Design and Participants:

A randomized, comparative, three-group clinical study conducted in Bengaluru, India, with 45 participants (15 per group), aged 18- 60 years. Participants diagnosed with Anxiety Disorders like; Generalized Anxiety Disorder (GAD), Substance / Medication Induced AD, AD due to another medical condition, Other Specified ADs, Unspecified Anxiety Disorders as per DSM-5-TR, having Beck Anxiety Inventory scores between 8 - 25 (mild to moderate), willing to provide informed consent were included in the study. Severe anxiety (above 26) with selected psychiatric or systemic conditions, and recent regular anxiolytic or antidepressant use were excluded from the study.

Interventions

- **Group A:** Cognitive Thought record + Shiro Abhyanga (Head massage) and Pada Abhyanga (Foot massage).
- **Group B:** Cognitive Thought record + Nadishuddhi Pranayama (Alternate nostril breathing) and Bhramari Pranayama (Humming sound breathing).
- **Group C:** Shiro Abhyanga (Head massage) and Pada Abhyanga (Foot massage) + Nadishuddhi Pranayama (Alternate nostril breathing) and Bhramari Pranayama (Humming sound breathing).

Procedure

Each therapy is given for a duration of 28 days, followed by 15 days of follow up without any intervention. The entire study duration is 45 days.

- *Cognitive Thought Record:* 7 steps; situation, mood rating, automatic thoughts, evidence for the thought, evidence against the thought, balanced alternative, and mood re-rating.
- *Shiras Abhyanga:* Head massage at approximately three-day intervals using warm coconut oil.
- *Pada Abhyanga:* Foot massage regularly at night, before going to bed using warm coconut oil.
- *Nadishuddhi Pranayama:* Alternate nostril breathing, 9 rounds, 4 times a day.
- *Bhramari Pranayama:* Inhale slowly and soft humming sound has to be produced while exhaling. Practised for 9 rounds, 4 times a day.

Assessment Criteria

- Subjective Parameters: Beck's Anxiety Inventory (BAI) (Beck, 1988, 16), Pittsburg Sleep Quality Index (PSQI) (Buysse et al., 1989. 17) and WHO Well Being Index (Bech, 1990, 18).
- Objective Parameters: Pulse rate, Blood pressure and Respiratory rate.
- Assessment Schedule: Baseline / Before Therapy (Day 0), After therapy (Day 30) and Follow up without therapy (Day 45).
- Statistical Analysis: Data expressed as Mean $\pm$ SD, Between-group comparison - ANOVA and Significance level - $p < 0.05$.

3. Results

The study comprised 45 participants, with 15 in each group. Baseline between-group differences were reported as non-

significant for the principal subjective outcomes. The mean trajectories for anxiety, global sleep quality, and well-being are shown in Figures 1–3; values are mean $\pm$ SD.

Anxiety Symptoms

BAI mean value declined from baseline to Day 29 in all groups: by 7.07 points in Group A (33.9%), 5.53 points in Group B (24.7%), and 12.53 points in Group C (56.9%). At Day 45, Group A had a small increase from its post-therapy score (13.80 to 14.40), and Group B increased from 16.87 to 18.20; Group C remained at 9.47. The dissertation reports a significant between-group difference at Day 29 and Day 45, and significant within-group baseline-to-post changes. These values indicate a stronger descriptive improvement in Group

C, not proof of superiority without verification of the analysis and appropriate post-hoc comparisons.

Sleep Quality and Well-Being

Global PSQI decreased by 4.40 points in Group A and 6.80 points in Group C at Day 29, compared with 2.13 points in Group B. By Day 45, scores were 5.47, 8.13, and 4.53, respectively. WHO-5 increased in all groups at Day 29 and remained above baseline at Day 45; the largest absolute increase from baseline to follow-up was in Group B (+3.86), while Group C had the highest follow-up mean (15.07). The dissertation reports between-group differences for global PSQI at Day 29 and Day 45, and for WHO-5 at both post-baseline assessments.

Table 1: Subjective outcome scores at each assessment interpreted as Mean $\pm$ SD

Outcome / group	Baseline	Day 29	Day 45	Reported between-group test
BAI – Group A	20.87 $\pm$ 2.56	13.80 $\pm$ 2.57	14.40 $\pm$ 2.97	Day 29: F=35.136, p<0.001 Day 45: F=39.255, p<0.001
BAI – Group B	22.40 $\pm$ 2.53	16.87 $\pm$ 2.20	18.20 $\pm$ 2.62	
BAI – Group C	22.00 $\pm$ 2.90	9.47 $\pm$ 2.50	9.47 $\pm$ 2.50	
Global PSQI – Group A	9.27 $\pm$ 4.33	4.87 $\pm$ 2.13	5.47 $\pm$ 3.40	Day 29: F=5.198, p=0.0096; Day 45: F=4.667, p=0.0148
Global PSQI – Group B	9.13 $\pm$ 4.37	7.00 $\pm$ 3.34	8.13 $\pm$ 4.07	
Global PSQI – Group C	10.87 $\pm$ 4.45	4.07 $\pm$ 2.05	4.53 $\pm$ 2.36	
WHO-5 – Group A	10.93 $\pm$ 4.06	14.20 $\pm$ 2.34	13.93 $\pm$ 2.76	Day 29: F=3.890, p=0.028; Day 45: F=3.545, p=0.038
WHO-5 – Group B	8.47 $\pm$ 4.73	12.67 $\pm$ 3.22	12.33 $\pm$ 3.42	
WHO-5 – Group C	11.27 $\pm$ 4.27	15.27 $\pm$ 1.98	15.07 $\pm$ 2.15	

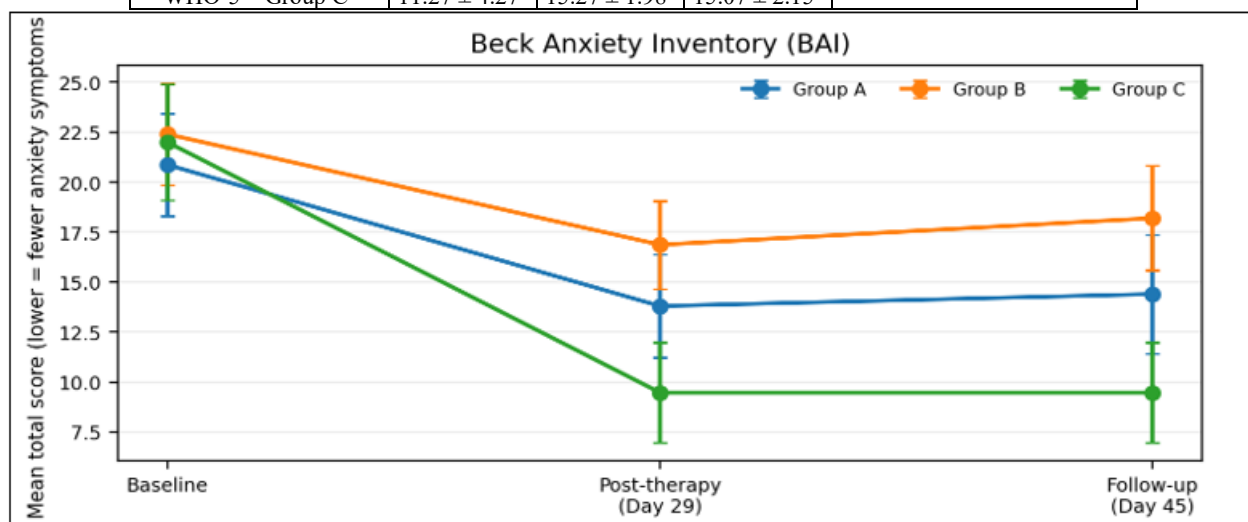


Figure 1: Beck Anxiety Inventory (BAI) across baseline, post-therapy, and follow-up. Points show group means; error bars show $\pm$ 1 SD

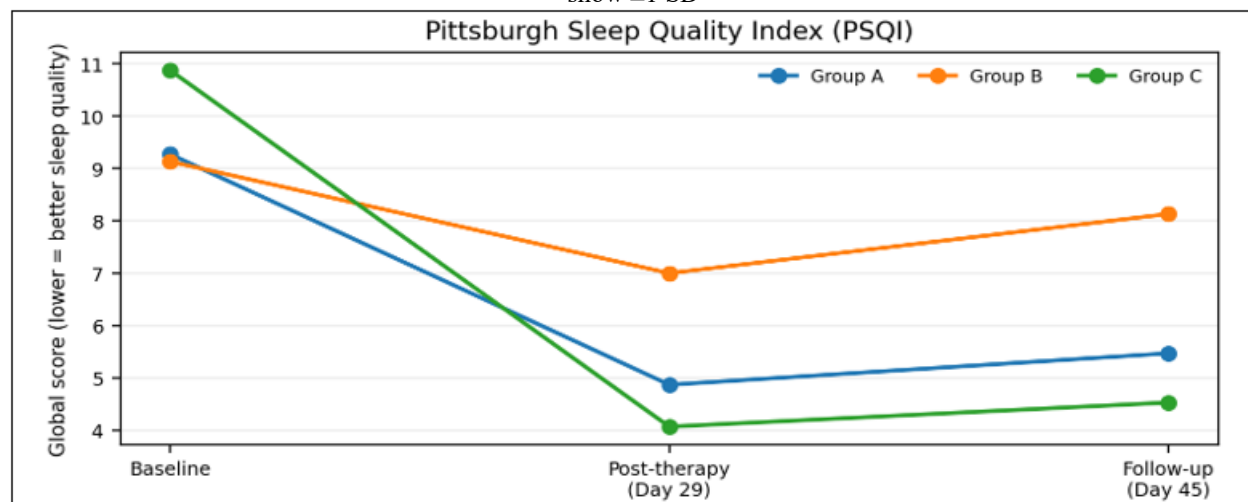


Figure 2: Global PSQI means across baseline, post-therapy, and follow-up. SD bars are omitted because the dissertation did not provide a complete set of group SDs for this outcome.

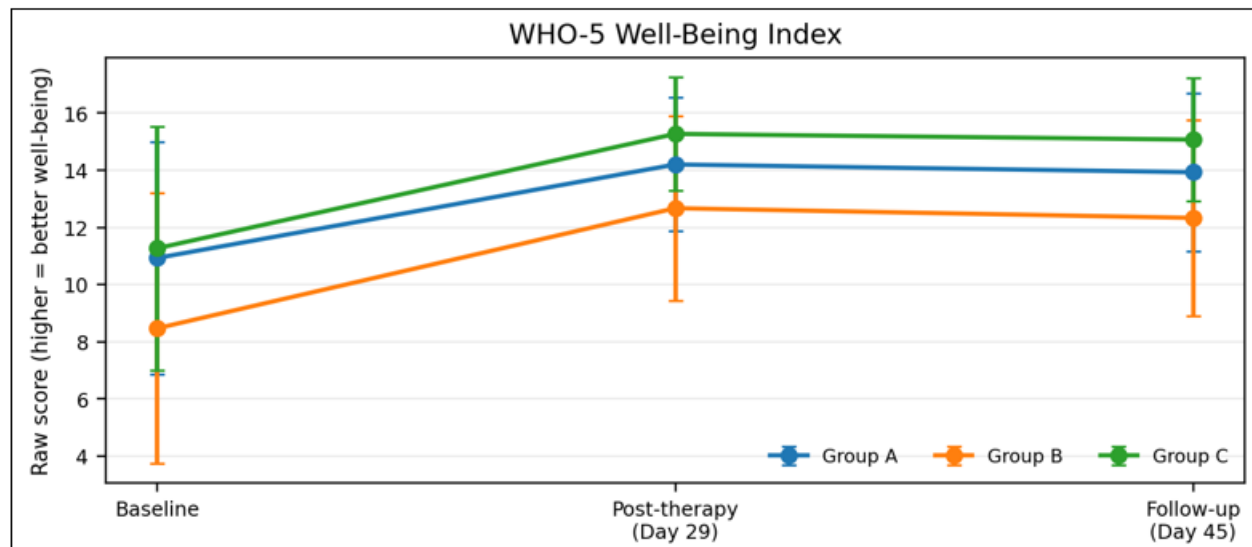


Figure 3: WHO-5 Well-Being Index across baseline, post-therapy, and follow-up. Points show group means; error bars show ± 1 SD.

4. Discussion

The findings of the present study indicate improvements in anxiety symptoms, sleep quality, and subjective well-being across all three intervention groups. There was no statistically significant baseline differences between groups, suggesting initial comparability. Regarding anxiety, paired t-tests showed significant reductions in Beck Anxiety Inventory (BAI) scores in all groups ($p < .001$). Group C (Shiras–Pada Abhyanga combined with Nadishuddhi–Bhramari Pranayama) demonstrated the largest reduction, from 22.00 at baseline to 9.47 on Day 29, which was maintained at Day 45. Group A (Cognitive Thought Record with Shiras–Pada Abhyanga) showed a reduction from 20.87 to 13.80, while Group B (Cognitive Thought Record with Nadishuddhi–Bhramari Pranayama) decreased from 22.40 to 16.87; both groups showed a slight increase in anxiety scores at follow-up. Between-group ANOVA results for BAI were significant on Day 29 ($F = 35.136$, $p < 0.0001$) and Day 45 ($F = 39.255$, $p < 0.0001$).

Sleep quality also improved, particularly in Groups A and C. Group C showed the greatest reduction in global Pittsburgh Sleep Quality Index (PSQI) scores, from 10.87 to 4.07 on Day 29, remaining at 4.53 on Day 45. Between-group differences were statistically significant at both assessments (Day 29: $p = .0096$; Day 45: $p = .0148$).

WHO-5 well-being scores increased in all groups, with Group C recording the highest follow-up mean (15.07), while Group B showed the largest absolute improvement from baseline. Between-group differences in WHO-5 scores were also reported at Day 29 ($p = .028$) and Day 45 ($p = .038$). Overall, the descriptive findings favour the Ayurveda–Yoga combination for sustained improvement in anxiety and sleep, although the small sample, short follow-up, and absence of a control group warrant cautious interpretation.

5. Conclusion

In this three-group study, all intervention combinations showed descriptive improvement in anxiety symptoms, sleep

quality, and subjective well-being over 28 days. The Ayurveda-plus-Yoga group showed the largest sustained mean reductions in BAI and global PSQI and the highest follow-up WHO-5 mean. The reported statistical analyses indicated significant between-group differences in key outcomes after intervention, while baseline differences were not statistically significant. Overall, the findings suggest that these integrative approaches may be promising complementary interventions for supporting anxiety management, sleep quality, and psychological well-being. However, the small sample size, absence of a control group, short follow-up period, and use of combined interventions require cautious interpretation and further research with larger samples and stronger study designs.

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