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"Efficacy of *Shirodhara* in the Management of Occupational Stress Among Working Adults: An Interventional Study"

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ABSTRACT

Occupational stress has emerged as a growing global health crisis, exerting a profound impact on psychological well-being, professional productivity, and overall quality of life. When stress transitions from acute to chronic, it contributes to anxiety, mood disturbances, fatigue, and systemic disorders. This phenomenon is grounded in diverse theoretical frameworks: Selye (1936) characterized stress as a "non-specific response" of the biological system to external demands[1], while Lazarus and Folkman (1984) highlighted the critical role of cognitive appraisal—how an individual perceives and copes with a stressor in determining the psychological toll[2].

In contrast to these Western models, Ayurveda views mental health through the lens of functional equilibrium between *Sharira* (the physical body) and *Manas* (the mind)[3]. *Shirodhara* a specialized therapy involving the continuous, rhythmic pouring of warm medicated oil over the forehead—serves as a cornerstone treatment for stress-related conditions[4].By targeting the *Ajna Chakra* and the nervous system, *Shirodhara* is believed to modulate the body's stress response, facilitating a state of profound mental health quality and restoring the psycho-biological harmony essential for navigating modern occupational demands.

Aim: To evaluate the efficacy of *Shirodhara* on occupational stress using standardized psychological assessment tools.

Materials and Methods: This study employed a prospective, single-arm interventional clinical trial to evaluate the efficacy of *Shirodhara* in mitigating occupational stress. The study was conducted on 45 working professionals aged 25–55 years experiencing occupational stress without systemic illness. To ensure a multidimensional assessment of the participants' psychological state, two validated instruments

were utilized: the Perceived Stress Scale (PSS-10) to measure the degree of perceived stress and the Profile of Mood States(POMS-SF) to evaluate fluctuations in affective mood states. The intervention consisted of daily *Shirodhara* sessions with *Brahmi* oil, each lasting between 20 to 30 minutes, administered over a continuous 14-days period. Baseline measurements were recorded on Day 0 and compared with post-intervention data collected after the final session. Statistical analysis was performed using a paired t-test to determine the significance of changes in stress and mood scores. A p-value <0.05 was considered statistically significant.

Results: The mean PSS-10 score reduced significantly from 25.12 ± 4.86 at baseline to 16.48 ± 3.72 after intervention ($t = 14.21$, $p < 0.001$). Significant improvement was observed in all negative mood domains of POMS-SF, while vigor scores increased significantly. Total Mood Disturbance (TMD) decreased significantly ($p < 0.001$).

Conclusion: The findings of this clinical trial demonstrate that *Shirodhara* significantly mitigates perceived occupational stress and facilitates a substantial improvement in overall mood states. By providing a quantifiable reduction in both PSS-10 and POMS-SF scores, this study underscores the therapeutic potential of *Shirodhara* as a robust, non-pharmacological *Ayurvedic* intervention. These results suggest that the application of *Shirodhara* may modulate the neurophysiological response to chronic stressors, offering a holistic alternative to conventional stress-management strategies. Ultimately, *Shirodhara* represents a viable, integrative approach for working professionals seeking to restore psychological equilibrium and enhance their quality of life.

Keywords: Occupational Stress, Shirodhara, PSS-10, POMS-SF, Ayurveda

INTRODUCTION

Occupational stress is increasingly recognized as a major contributor to psychological morbidity, reduced work efficiency and organizational productivity. The conceptual evolution of this phenomenon began with **Hans Selye**, who first identified stress as a "general adaptation syndrome" a non-specific biological response to environmental demands[1]. This physiological perspective was later expanded by **Lazarus and Folkman**, who introduced a transactional model emphasizing that stress is not merely a stimulus, but a dynamic process governed by **cognitive appraisal** and an individual's perceived capacity to coping[2]. When these coping mechanisms are overwhelmed, chronic occupational exposure frequently culminates in a deleterious cascade of emotional exhaustion, pervasive anxiety, and somatic dysfunction.

The **Perceived Stress Scale (PSS)**[5], formulated by Cohen et al., remains the gold standard for measuring the degree to which life situations are appraised as stressful. Complementing this, the assessment of affective fluctuations is often conducted via the **Profile of Mood States (POMS)**. Originally developed by McNair et al[6]. and subsequently refined into a "Short Form" by Shacham[7], the POMS-SF provides a sensitive multidimensional profile of mood disturbances, including tension, depression, and fatigue. Together, these validated psychometric instruments provide a robust framework for evaluating the efficacy of therapeutic interventions in restoring psychological equilibrium.

In the foundational framework of **Ayurveda**, health is not merely the absence of disease but a state of holistic equilibrium. This is encapsulated in the classical definition of *Svastha:*

"समदोषः समाग्निश्च समधातु मलक्रियः ।
प्रसन्नात्मेन्द्रियमनः स्वस्थ इत्यभिधीयते ॥"

(*Sushruta Samhita, Sutrasthana* 15/41)[3]

This definition underscores that true well-being requires a serene union of the *Atma (soul), Indriya (senses), and Manas (mind)*. Within this paradigm, psychological disturbances are viewed as a disruption of this harmony, specifically through the imbalance of the *Manasika Doshas*—***Rajas*** (activity/passion) and ***Tamas*** (inertia/darkness)—often along with vitiation of ***Vata Dosha***, the primary driver of the nervous system.

To address these imbalances, *Shirodhara*, a classical therapeutic procedure, involves continuous pouring of medicated liquid over the forehead is traditionally indicated for *Anidra* (insomnia), *Shiroroga* (head ailments), and various *Manasika Vikara* (mental disorders). Modern physiological investigations suggest that this procedure may modulate the Autonomic Nervous System (ANS), shifting the body from a sympathetic "fight-or-flight" state to a parasympathetic relaxation response.Considering the growing prevalence of occupational stress and the classical indications of *Shirodhara* in mental disturbances, this study was undertaken.

AIM AND OBJECTIVES

Aim:

To scientifically evaluate the therapeutic efficacy of *Shirodhara* in the clinical management of occupational stress among working professionals.

Objectives:

1. To measure changes in perceived stress levels using the validated Perceived Stress Scale (PSS-10)[5] as a primary outcome measure.
2. To assess the impact of the intervention on multidimensional mood states—including tension, depression, anger, vigor, fatigue, and confusion—utilizing the Profile of Mood States – Short Form (POMS-SF)[6,7].
3. To observe the role of *Shirodhara* in pacifying *Vata Dosha* and balancing *Manasika Doshas (Rajas and Tamas)* as reflected in improved psychological well-being.
4. To determine the clinical and statistical significance of the intervention through parametric testing[8].

MATERIALS AND METHODS

✧ **Study Design** - This study utilized a prospective, single-arm, interventional clinical trial design. The trial was conducted over a period of 14 days to evaluate the therapeutic efficacy of *Shirodhara* in a controlled cohort of working professionals.

✧ **Participant Selection and Sampling** - A purposive sample of 45 working professionals, aged 25 to 55 years, was recruited for the study.

Inclusion was strictly limited to individuals demonstrating moderate to high perceived stress, operationally defined as a score of ≥14 on the Perceived Stress Scale (PSS-10).

Participants with pre-existing systemic illnesses or those on psychotropic medication, were excluded to isolate the effect of the *Ayurvedic* intervention.

✧ **Therapeutic Intervention**- The intervention consisted of daily *Shirodhara* sessions administered for 14 consecutive days.

✧ **Duration**: Each session lasted between 20 and 30 minutes.

✧ **Procedure**: The therapy followed the standardized *Ayurvedic* protocol and was carried out in three distinct phases.

1. ***Purva Karma*** **(Pre-operative Procedure)**

Before the commencement of the main therapy, the participant was prepared to ensure maximum absorption and therapeutic efficacy:

- Vitals Recording: Baseline heart rate and blood pressure were recorded.
- *Abhyanga:* A mild head massage (*Shiro-Abhyanga*) was performed using lukewarm medicated oil to relax the scalp muscles and improve local circulation.
- Positioning: The participant was advised to lie in a supine position on the *Droni* (massage table) with a small pillow under the neck for support, ensuring the head was tilted slightly backward.
- Eye Protection: The eyes were covered with sterile cotton pads or a gauze strip to prevent medicinal oil from entering the eyes.

2. **Pradhana Karma (Main Procedure)**

The core of the intervention involved the rhythmic application of the liquid:

- The Pouring Technique: *Brahm*i oil was poured into the *Dhara Patra* (oscillating pot) suspended approximately 4 inches above the forehead.
- Stream Maintenance: A continuous, uniform stream (*Dhara)* was directed onto the *Sthapani Marma* (the space between the eyebrows), then oscillated slowly from temple to temple.
- Duration: This rhythmic flow was maintained for 20–30 minutes, ensuring the temperature of the liquid remained constant throughout the session.

3. **Pashchat Karma (Post-operative Procedure)**

Post-therapy care is crucial for stabilizing the *Manasika* state and preventing *Vata* vitiation:

- Cleaning: The forehead was wiped clean, and the participant was advised to remain in a supine position for 10–15 minutes of quiet rest (*Shavasana*).
- *Snana* (Bath): Participants were instructed to avoid immediate cold-water baths; instead, they were advised to use lukewarm water for head washes after an hour.
- Dietary Regimen: A light, *Satvik* diet was recommended, avoiding caffeine and heavy stimulants that could interfere with the relaxation response.
- Activity: Participants were advised to avoid direct exposure to sunlight, heavy winds, and loud environments immediately following the procedure.

✧ **Standardization**: To maintain clinical consistency, all procedures were performed at the same time of day for each participant under tranquil environmental conditions[4].

✧ **Outcome Measures:**

Primary Outcome: By Perceived Stress Scale (PSS-10)[5] - The primary endpoint was the change in subjective stress levels as measured by the PSS-10 (Cohen et al., 1983). This is validated 10-item instrument assesses the degree to which life situations are appraised as unpredictable, uncontrollable, and overloading.

Scoring: Responses are recorded on a 5-point Likert scale, with total scores ranging from 0 to 40.

Evaluation: Assessments were conducted at Before (Day 0) and Post-Intervention (Day 14).

Secondary Outcome: By Profile of Mood States – Short Form (POMS-SF)[7] - To evaluate fluctuations in affective states, the POMS-SF (Shacham, 1983) was employed. This multidimensional tool assesses six distinct mood domains: Tension-Anxiety, Depression-Dejection, Anger-Hostility, Vigor-Activity, Fatigue-Inertia, and Confusion-Bewilderment.

Total Mood Disturbance (TMD): The TMD score was calculated using the standard formula:

TMD = (Tension + Depression + Anger + Fatigue + Confusion) - Vigor

Clinical Significance: A reduction in the TMD score indicates an improvement in psychological resilience and emotional stability.

Assessment: Assessments were conducted at Before (Day 0) and Post-Intervention (Day 14).

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STATISTICAL ANALYSIS

To assess the therapeutic effect of *Shirodhara,* a Paired t-test was utilized to compare the mean scores of the participants at Before (Day 0) and Post-Intervention (Day 14). This test was chosen to measure the magnitude of change within the same group over the 14-day duration..

Significance Levels- P-Value less than 0.05 considered statistically significant while P-Value greater than 0.05 considered as statistically not significant.

The data collected from the 45 participants were systematically coded and analyzed using SPSS (Statistical Package for the Social Sciences) version 20.0.

RESULTS

Table 1: Comparison of PSS score before and after intervention using Paired t-test

PSS	Mean	N	SD	SE	t-Value	P-Value	% Change	Result
BT	24.20	45	4.24	0.36	14.21	<0.001	35.86%	Sig
AT	15.52	45	3.57	0.28				

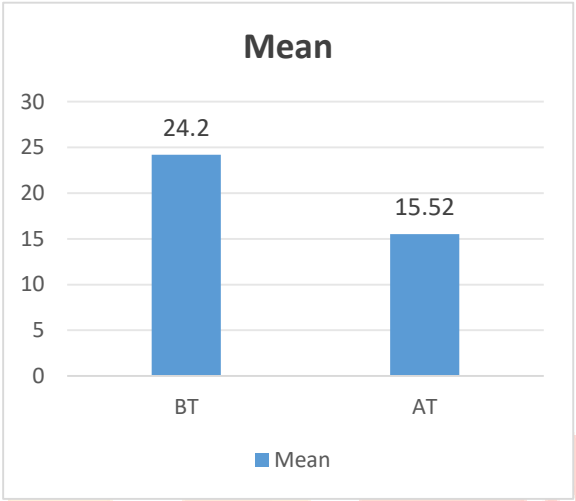


Table 2: Comparison on POMS-SF Sub-scales score before and after intervention using Paired t-test

Subscale	POMS-SF	Mean	N	SD	SE	t-Value	P-Value	% Change	Result
Tension	BT	16.20	45	3.40	0.51	12.10	<0.001	39.14%	Sig
	AT	9.86	45	2.60	0.39				
Depression	BT	15.20	45	3.65	0.54	10.42	<0.001	39.47%	Sig
	AT	9.20	45	3.10	0.46				
Anger	BT	14.60	45	3.60	0.54	9.80	<0.001	44.52%	Sig
	AT	8.10	45	2.80	0.42				
Fatigue	BT	14.20	45	3.65	0.54	11.05	<0.001	39.44%	Sig
	AT	8.60	45	2.50	0.37				
Confusion	BT	11.40	45	2.90	0.43	9.21	<0.001	36.84%	Sig
	AT	7.20	45	2.20	0.33				
Vigor	BT	8.25	45	2.60	0.39	-12.40	<0.001	70.91%	Sig
	AT	14.10	45	3.20	0.48				

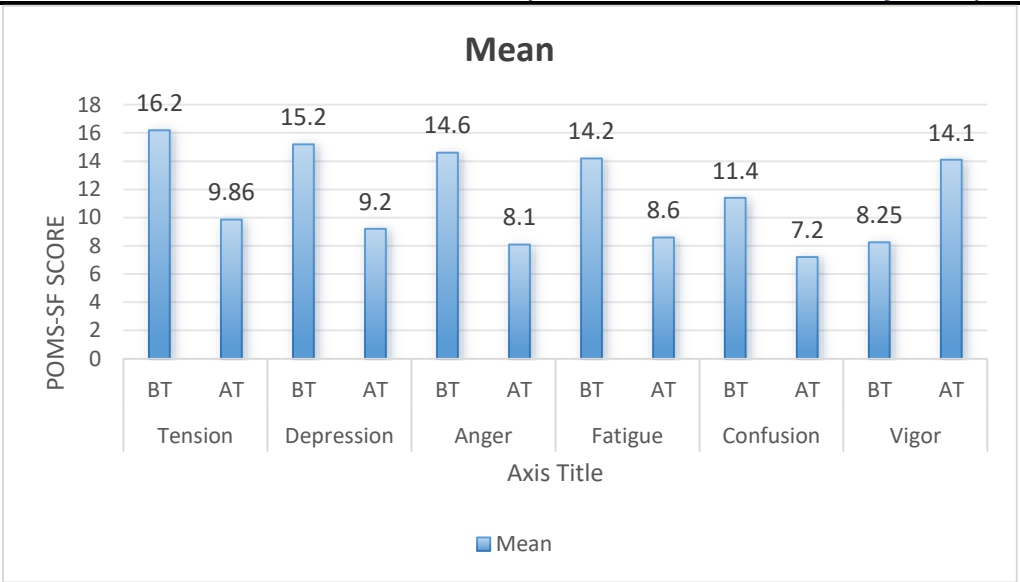
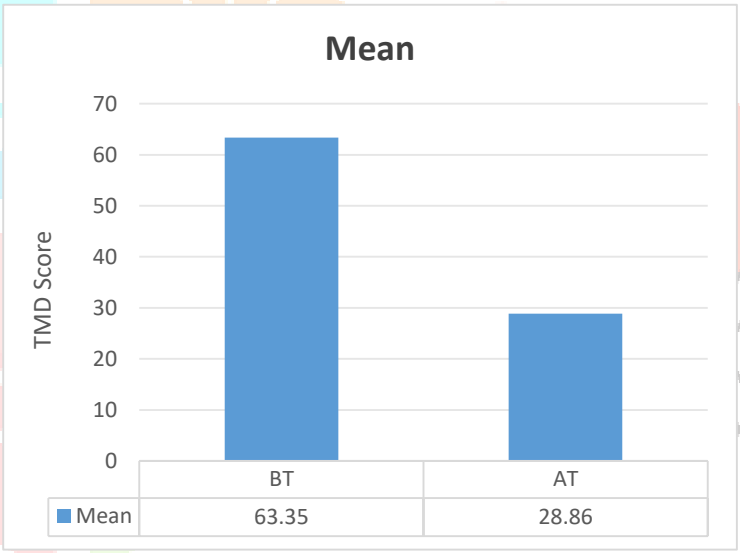


Table 3: Comparison of Total Mood Disturbance score before and after intervention using Paired t-test
TMD = (Tension + Depression + Anger + Fatigue + Confusion) - Vigor

BT	63.35	45	11.20	1.67	15.30	<0.001	54.44%	Sig
AT	28.86	45	9.10	1.36				



DISCUSSION

The results of the present study demonstrate a statistically significant reduction in perceived occupational stress following a 14-day course of *Shirodhara* therapy. The marked decrease in PSS-10 scores aligns with the theoretical framework of stress perception established by Cohen et al., suggesting that the intervention effectively altered the participants' cognitive appraisal of their environmental demands. Furthermore, the notable improvement across multiple mood domains in the POMS-SF—particularly in the reduction of tension and fatigue—indicates a profound emotional stabilization.

"Pathophysiologically, occupational stress involves the vitiation of *Vata* and *Rajas,* manifesting as *Chittodvega. Shirodhara* acts as a targeted therapy to pacify these imbalances. By stimulating the *Sthapani Marma,* the procedure regulates *Prana Vata* (governing the central nervous system) and stabilizes *Sadhaka Pitta* (governing emotional intelligence). This dual action effectively mitigates the symptoms of mental distress and restores the psycho-biological equilibrium essential for cognitive efficiency.". This

dual action restores the *Manasika* equilibrium, promoting the mental clarity and tranquility essential for professional efficiency.

From a contemporary scientific perspective, the efficacy of *Shirodhara* may be attributed to its influence on the Autonomic Nervous System (ANS) and the Hypothalamic-Pituitary-Adrenal (HPA) axis. The continuous, rhythmic pressure of the medicated oil on the forehead likely triggers a tactile sensory response that shifts the body from a sympathetic-dominant "fight-or-flight" state to a parasympathetic "rest-and-digest" response. This transition facilitates neuroendocrine modulation, potentially lowering cortisol levels and inducing a state of deep relaxation, as corroborated by previous modern investigations into the therapy's sedative effects.

The application of the paired t-test was highly appropriate for this study design. Statistical validity was maintained through the use of a paired t-test, which is specifically designed for within-subject designs where population parameters are unknown. By analyzing the change in scores from Day 1 to Day 14 for each participant, this method provided a rigorous mechanism to attribute the clinical improvements directly to the *Shirodhara* therapy[8].

CONCLUSION

The findings of this clinical trial demonstrate that ***Shirodhara*** is a highly effective intervention for the significant reduction of perceived occupational stress and the enhancement of overall mood states. As it is a non-invasive, safe, and cost-effective procedure, *Shirodhara* represents a viable alternative or complementary approach to conventional stress-management protocols. These results suggest that incorporating *Shirodhara* into wellness programs for working professionals could mitigate the long-term systemic risks associated with chronic occupational pressure, ultimately fostering a more resilient and productive workforce.

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