

Therapeutic outcomes of Scientific Pranayama in hypothyroidism

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Abstract - Hypothyroidism (HT) is a common endocrine disorder associated with autonomic dysregulation that impairs quality of life, occurring more frequently in women and the elderly. Disease management requires lifelong thyroid hormone supplements, emphasizing the need for alternate adjunctive interventions that can potentially reduce long-term dependence on medication. Scientific Pranayama (SP) is a structured breathing practice that can modulate autonomic balance and promote physiological homeostasis, suggesting potential relevance in the management of metabolic disorders.

This pilot study evaluated the effects of SP in adult women with a clinical history of hypothyroidism on stable pharmacological therapy. After a health assessment, participants underwent instructional sessions to ensure proper technique and therapeutic awareness. Each participant received a customized SP regimen practiced daily for 2- consecutive days to support autonomic regulation and thyroid health.

Outcomes were assessed using subjective and objective measures. Symptom burden and overall well-being were evaluated using the Thyroid Quality of Life End-of-Study (ThyroQOL-EOS) questionnaire before and after intervention. Where feasible, serum thyroid function tests were obtained pre- and post-intervention to assess biochemical changes due to SP.

Evaluation of subjective measures revealed consistent benefits of SP practice. Importantly, four individuals were able to reduce their medication dosage after completing the 21-day program. Preliminary findings indicate Scientific Pranayama as a safe, feasible, and an effective intervention strategy, meriting consideration as an adjunctive therapy in hypothyroidism. These findings support the rationale for larger, controlled studies to rigorously evaluate the therapeutic benefits of SP in thyroid-related physiological outcomes.

Key Words: Hypothyroidism, Endocrine dysfunction, Scientific-pranayama, Autonomic regulation, adjunct therapy

1. INTRODUCTION

Hypothyroidism is a common endocrine disorder that affects almost 10 in every 35 individuals, with a high prevalence in the elderly and about six times higher frequency in women [1]. Hypothyroidism arises from diverse etiologies, including nutritional deficiencies, autoimmune thyroid destruction (commonly Hashimoto's thyroiditis), hormonal imbalance (during pregnancy, postpartum, or menopause), as well as impaired TSH or TRH secretion due to dysfunctional pituitary or hypothalamus. The rising prevalence of hypothyroidism is attributed to adverse lifestyle and chronic stress [1][2]. Clinically, HT presents with diverse symptoms that contribute to delayed diagnosis and treatment [3]. Levothyroxine is the standard treatment for HT for life to restore euthyroidism. However, some patients continue to experience persistent symptoms despite normalized serum thyroid hormone levels [4].

Scientific Pranayama (SP), an integral component of the ancient yogic system, is the practice of conscious, deep, and rhythmic breathing. Conscious breathing techniques modulate autonomic balance and may improve organ function through enhanced oxygenation, metabolic homeostasis, and cellular rejuvenation [5][6]. SP encompasses a structured sequence of eight breath regulation techniques (Ashta Pranayama) from high to low respiratory frequency, each with specific physiological benefits. This regimen comprising of Bhastrika, Kapalbhathi, Bahya Kumbhaka, Ujjayi, AnulomVilom, Bhramari, Udgeeta, and Pranava pranayamas, may be adapted with condition specific modifications and holds potential as a therapeutic adjunct for the management of physical, psychological, and psychosomatic disorders [6].

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2. METHODOLOGY

This pilot single arm study included ten women (between 39 to 68 years; median age 47) with clinically diagnosed HT on stable medication. Baseline data were collected using a questionnaire documenting symptoms, medication history and recent thyroid function parameters, followed by telephonic interviews to obtain detailed case histories.

SP intervention was delivered remotely to participants residing in Singapore, China, Hong Kong, the United States, and India. A five-day instructional phase introduced the Ashta pranayama techniques, their physiological benefits, and their contraindications enhancing practice awareness and through supervised live practice. Participants subsequently completed a 21-day SP regimen comprising a 60 minute morning session on an empty stomach and a 30 minute evening session performed at least three hours after meals (Table 1). All participants followed the general SP regimen except Case 1, who received a modified regimen incorporating Sheetali Upa-Pranayama following Kapal Bhati to alleviate hot flashes. Medications were permitted prior to practice with minimal water (<75 ml). Practice was monitored using a daily self-reported tracker. Participants were included in the final analysis if they completed at least seven consecutive sessions with a minimum of 40 minutes of practice per session. Temporary abstinence was advised during menstrual cycles or intercurrent illness. The study was conducted from 7th March to 2nd April 2025.

Outcomes of intervention were evaluated using the Thyroid Quality of Life – End of Study (ThyroQOL-EOS) binary scoring questionnaire (parameters listed in Table 2). Participants recorded changes in symptoms before and after intervention; symptoms not present were marked as “not applicable.”

Practice session	Pranayama technique and specifications
Morning	<i>Bastrika: 5 minutes (60 strokes, 1 breath every 5 seconds)</i> <i>Kapal Bhati: 10 minutes (600 strokes at 1 stroke per sec)</i> <i>Bhahya Kumbhaka: 10 rounds</i> <i>Ujjayi: 10 minutes</i> <i>Anulom-Vilom: 15 minutes</i> <i>Bramhari: 10 rounds</i> <i>Udgeeta: 21 rounds</i> <i>Pranava: 5 minutes to as long as possible</i>
Evening	<i>Ujjayi: 10 minutes</i> <i>Anulom-Vilom: 15 minutes</i> <i>Pranava: 5 minutes to as long as possible</i>

Table -1: General Scientific Pranayama regimen

3. RESULTS

Ten individuals with clinically diagnosed HT, including cases of idiopathic, hormone related HT (pregnancy, postpartum, or perimenopause associated) and autoimmune Hashimoto's thyroiditis, were enrolled in this single arm study.

At baseline, participants reported significant symptom burden, including fatigue, weight gain, psychological stress related to diagnosis, reduced motivation, and additional individualized physical and emotional complaints. Post-intervention, all participants reported increased energy, reduced lethargy, enhanced calmness, and decreased anxiety. Improvements were additionally observed in sleep quality (7/10 participants), decreased blood pressure (3/10), cognitive clarity (6/10), digestion (8/10), constipation (6/10), muscle weakness (6/10), vasomotor symptoms (3/10), menstrual discomfort (2/10), weight reduction (1/10), and overall sense of empowerment (7/10) as summarized in Table 2. One of the participants overcame dependence on alcohol and cigarettes with the SP program. No adverse events were recorded.

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Improvement in/Case #	1	2	3	4	5	6	7	8	9	10
General wellbeing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Energy levels	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lethargy/tiredness	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Weight reduction	No	No	No	No	No	Yes	No	No	No	No
Muscle aches/weakness	Yes	Yes	Yes	Yes	Not applicable	Yes	Yes	No	Not applicable	No
Hunger	No	Yes	Yes	Yes	No	Yes	No	No	Not applicable	No
Digestion	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not applicable	No
Constipation	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Not applicable	No
Menstrual cramp pain	Not applicable	No	Yes	Yes	No	Not applicable	No	No	Not applicable	No
Hot flashes	Not applicable	Yes	Yes	Yes	Not applicable	Not applicable	No	No	Not applicable	No
Blood pressure	Not applicable	Yes	Yes	No	Not applicable	Not applicable	No	Not applicable	Not applicable	Yes
Sleep	Yes	Yes	Yes	Yes	Not applicable	Yes	No	No	Yes	Yes
Brain fog issues	Not applicable	Yes	Yes	Yes	Not applicable	Yes	No	Yes	Not applicable	Yes
Calmness of mind	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Anxiety	Not applicable	Yes	Yes	Yes	Not applicable	Yes	Yes	Yes	Yes	Yes
Feeling of empowerment	Not applicable	Yes	Yes	Yes	Not applicable	Yes	Yes	Not applicable	Yes	Yes
Serum T4/T3/TSH	Yes	Not done	Yes	Not done	Yes	Yes	Yes	Not done	Not done	Not done

Table -2: Summary of subjective *ThyroQOL-EOS* response

Biochemically, improvements in thyroid parameters were observed in 5 cases with altered serum T4/T3 and TSH levels, and a reduction in anti-thyroid antibody titers in one participant with Hashimoto’s autoimmune hypothyroidism as shown in Table 3 (note, that in some cases, testing was done in different laboratories, indicating varying units and references). Biochemical improvements following the SP program resulted in supervised tapering of medication dosage in 4 of 5 participants.

Case #	Serum measurements pre-intervention	Serum measurements post-intervention
1	Free T3-2.55 pg/L (ref: 2.3-4.2) Free T4-1 ng/dL (ref: 0.89-1.76) TSH-4.15 mIU/L (ref: 0.34-5.6)	Free T3-0.74 pg/L (ref: 0.6-1.81) Free T4-6.3 ng/dL (ref: 4.5-11.6) TSH-4.67 mIU/L (ref: 0.55-4.78)
3	Free T3-4.55 pmol/L (ref: 3.16-6.8) Free T4-24.9 pmol/dL (ref: 12-22)	Free T3-4.38 pmol/L (ref: 3.16-6.8) Free T4-19.2 pmol/dL (ref: 12-22)
5	Free T3-4.34 pmol/L (ref: 3.16-6.8) TSH-7.51 mIU/L (ref: 0.27-4.2)	Free T3-2.73 pmol/L (ref: 3.16-6.8) TSH-6.29 mIU/L (ref: 0.27-4.2)
6	Free T4-17.4 pmol/L (ref: 12-11) TSH-2.91 mIU/L (ref: 0.27-4.2)	Free T4-21.7 pmol/L (ref: 12-11) TSH-0.215 mIU/L (ref: 0.27-4.2)
7	Total T3-1.26 pg/L (ref: 0.35-1.93) Total T4-8.3 pmol/L (ref: 12-11) TSH-2.91 mIU/L (ref: 4.87-11.72) Anti-thyroglobulin 14.4 IU/ml (ref: 0-0.411)	Total T3-2.08 nmol/L (ref: 0.89-2.44) Total T4-102.5 nmol/L (ref: 66-181) TSH-7.95 mIU/L (ref: 0.27-4.2) Anti-thyroglobulin 81.21 IU/ml (ref: <115)

Table -3: Biochemical results pre- and post- SP intervention

Overall, the SP program resulted in favorable self-reported physiological, psychological, and select biochemical outcomes over the 21-day intervention period.

4. DISCUSSION

Management of HT remains clinically challenging due to the complexity of thyroid hormone regulation, interpatient variability, and limitations in current diagnostic and therapeutic approaches [3]. Hypothyroidism is increasingly being recognized as a multifactorial endocrine–metabolic disorder influenced by stress, lifestyle, and autonomic imbalance [2] and is associated with heightened risk of insulin resistance and cardiovascular disorders. HT is thus a systemic disorder with broad metabolic and vascular implications [1].

Pranayama facilitates systemic physiological regulation by integrating breath, body, and mind. Conscious, deep, and rhythmic breathing may reduce stress induced autonomic dysregulation, enhance parasympathetic tone, and support hypothalamic-pituitary-thyroid (HPT) axis function [7], providing a basis for systemic and endocrine normalization in hypothyroid patients. In our pilot study, pranayama demonstrated positive effects across diverse forms of hypothyroidism, idiopathic, hormonal, and autoimmune etiologies, reinforcing its potential in alleviating chronic stress, recalibrating autonomic function, restoring hormonal balance, and modulating immune responses. While pranayama is widely recognized for promoting wellbeing,

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rigorous scientific evidence remains limited, particularly regarding its impact in hypothyroidism. These preliminary findings suggest that pranayama may not only benefit thyroid function but also mitigate the psychosomatic effects of stress, with broader implications in other metabolic and stress related disorders.

5. CONCLUSIONS AND FUTURE WORK

The findings of this pilot intervention suggest that Scientific Pranayama practice may offer meaningful benefits in individuals with hypothyroidism. Participants reported consistent improvements in symptoms and overall wellbeing. In selected cases, post-intervention thyroid function tests led to supervised adjustments in medication dosage.

Hypothyroidism is a complex endocrine and metabolic disorder in which psychosocial stress and lifestyle contribute to autonomic imbalance and disorder. The observed benefits of SP may be mediated through modulation of the autonomic nervous system, attenuation of stress responses, improved thyroid function, and potential stabilization of hypothalamic-pituitary-thyroid (HPT) axis.

While these preliminary findings are encouraging, the present study is limited by its small sample size, single-arm design, and subjective endpoints. Larger, randomized controlled trials with standardized biochemical measurements are required to validate these results and to elucidate the mechanisms underlying the therapeutic effects of scientific pranayama in hypothyroidism.

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REFERENCES

- [1] L. Chaker and M. Papaleontiou, "Hypothyroidism: A Review," 2025. doi: 10.1001/jama.2025.13559.
- [2] P. N. Taylor, M. M. Medici, A. Hubalewska-Dydejczyk, and K. Boelaert, "Hypothyroidism," 2024. doi: 10.1016/S0140-6736(24)01614-3.
- [3] P. Perros, C. Van Der Feltz-Cornelis, E. Papini, E. V. Nagy, A. P. Weetman, and L. Hegedüs, "The enigma of persistent symptoms in hypothyroid patients treated with levothyroxine: A narrative review," *Clin. Endocrinol. (Oxf)*, vol. 98, no. 4, pp. 461–468, Apr. 2023, doi: 10.1111/cen.14473.
- [4] S. Singh, "Pranayama Effects Physically and Mentally on Human Body," *International Journal of Advanced Research in Science, Communication and Technology International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal*, vol. 5, no. 1, 2025, doi: 10.48175/568.
- [5] A. A. Saoji, B. R. Raghavendra, and N. K. Manjunath, "Effects of yogic breath regulation: A narrative review of scientific evidence," 2019. doi: 10.1016/j.jaim.2017.07.008.
- [6] K. Petrowski and G. J. Kahaly, "Stress and Thyroid Function—From Bench to Bedside," 2025. doi: 10.1210/endoev/bnaf015.
- [7] S. Ashhad, K. Kam, C. A. Del Negro, and J. L. Feldman, "Breathing Rhythm and Pattern and Their Influence on Emotion," 2022. doi: 10.1146/annurev-neuro-090121-014424.