

Effect of Naturopathic Interventions on Thyroid Profile, Anthropometrics, Symptoms and Quality of Life in Subjects with Hypothyroidism: A Pre–Post Interventional Study

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Abstract

Background: Hypothyroidism is a common endocrine disorder associated with elevated thyroid-stimulating hormone (TSH), weight gain, metabolic disturbance and reduced quality of life. Naturopathic interventions combining hydrotherapy, mud therapy, massage and dietary regulation may support thyroid modulation and symptom relief through non-pharmacological mechanisms.

Objectives: To evaluate the effect of a 10-day naturopathic intervention protocol on thyroid profile (primarily TSH), anthropometrics, clinical symptoms (Zulewski score) and quality of life in subjects with hypothyroidism.

Materials and Methods: A single-group pre–post pilot study was conducted on 10 female participants (age 18–55 years) with clinically diagnosed hypothyroidism at GNCYMC&H, Mysore. Participants received a standardised 10-day protocol including mud application to throat, abdominal mud pack, neutral hip bath, steam bath, massage therapies, circular jet, underwater massage, therapeutic juice fasting and raw diet. Outcomes were weight, BMI, TSH, T3, T4, Zulewski clinical score and quality-of-life (QOL) score, assessed on Day 1 and Day 10. Data were analysed using Wilcoxon signed-rank and paired t-tests; effect sizes were expressed as Cohen's d.

Results: Highly significant improvements were observed. Weight decreased from 71.93 ± 5.17 kg to 68.06 ± 4.79 kg ($\Delta -3.88$ kg, $p = 0.002$). BMI decreased from 28.48 ± 2.32 to 26.97 ± 2.23 kg/m² ($\Delta -1.51$, $p = 0.002$). TSH decreased from 11.58 ± 9.42 to 2.74 ± 1.89 μ IU/mL ($\Delta -8.85$, $p = 0.002$). Zulewski score decreased from 6.00 ± 2.00 to 1.30 ± 1.16 ($\Delta -4.70$, $p = 0.002$). QOL improved from 46.56 ± 14.14 to 74.56 ± 12.96 ($\Delta +28.00$, $p = 0.002$). All 10 participants improved on these primary measures. T4 showed no significant change; T3 decreased but values appeared to use mixed units.

Conclusion: A short-course naturopathic intervention was associated with statistically significant and clinically meaningful reductions in TSH, body weight, BMI and symptom burden, together with improved quality of life in subjects with hypothyroidism. Larger controlled trials with standardised hormone assays are warranted.

Keywords: Hypothyroidism; TSH; Naturopathy; Mud therapy; Hydrotherapy; Juice fasting; Zulewski score; Quality of life; Pre–post study

1. Introduction

Hypothyroidism results from inadequate production or action of thyroid hormone and is among the most common endocrine disorders worldwide. Prevalence increases with age and is substantially higher in women; autoimmune thyroiditis (Hashimoto's disease) is the leading cause in iodine-sufficient regions [1–3]. Untreated or inadequately controlled hypothyroidism is associated with fatigue, weight gain, cold intolerance, constipation, cognitive impairment, dyslipidaemia and reduced quality of life, and may contribute to cardiovascular risk [3,4].

Standard medical management centres on levothyroxine (L-T₄) monotherapy. While effective for most patients, a subset remains symptomatic, and interest in complementary approaches that address lifestyle, metabolism and stress continues to grow [5]. Naturopathy emphasises the body's self-healing capacity through modalities such as hydrotherapy, mud therapy, manipulative therapy, dietary modification and fasting therapy. Proposed mechanisms relevant to hypothyroidism include improved local and systemic circulation, reduction of inflammatory load, bowel regulation, stress reduction and metabolic support [6,7].

Previous reports and clinical observations suggest that integrated naturopathic programmes may favourably influence thyroid-related symptoms, body weight and selected biochemical markers. However, controlled evidence specifically linking short-course residential naturopathic protocols to changes in TSH and validated symptom scores remains limited. The present pilot study evaluated the effect of a standardised 10-day naturopathic intervention on thyroid profile, anthropometrics, clinical symptoms and quality of life in subjects with hypothyroidism.

2. Aims and Objectives

Primary objective: To evaluate the effectiveness of planned naturopathic interventions in modulating thyroid function parameters (particularly TSH) in subjects with hypothyroidism.

Secondary objectives: To assess changes in body weight, BMI, clinical symptom burden (Zulewski score) and quality of life; and to observe participant acceptance of the intervention.

3. Materials and Methods

3.1 Study design and setting

A single-group pre–post pilot study was conducted at the Outpatient/Inpatient Department of Government Nature Cure and Yoga Medical College & Hospital (GNCYMC&H), Mysore, Karnataka, India.

3.2 Participants

Ten female participants aged 18–55 years with clinically diagnosed hypothyroidism were enrolled after written informed consent. All completed the 10-day protocol.

Inclusion criteria: Diagnosis of hypothyroidism; age 18–55 years; willingness to participate and provide informed consent; ability to undergo the planned naturopathic procedures.

Exclusion criteria: Severe systemic illness limiting participation; acute infection; pregnancy; recent thyroid surgery or radioiodine therapy; inability to comply with dietary or procedural requirements.

3.3 Intervention

Participants received a standardised 10-day naturopathic protocol comprising: mud application to the throat region; abdominal mud pack; neutral hip bath; steam bath; partial massage (abdomen and bilateral legs); full-body massage; circular jet; underwater massage; therapeutic juice fasting; and raw diet. Procedures were administered under supervision according to institutional practice. Concurrent conventional medication, if any, was continued and adjusted by the treating physician as clinically indicated.

3.4 Outcome measures

Assessments were performed on Day 1 (pre-intervention) and Day 10 (post-intervention):

- Anthropometrics: body weight (kg) and BMI (kg/m²).
- Thyroid profile: TSH (primary biochemical outcome), T3 and T4 (interpreted cautiously because of apparent mixed reporting units).
- Clinical symptoms: Zulewski clinical score (higher scores indicate greater hypothyroid symptom/sign burden).
- Quality of life: questionnaire score (higher scores indicate better quality of life).

3.5 Statistical analysis

Descriptive statistics (mean, SD, median, minimum, maximum) were calculated for pre-intervention, post-intervention and change (post – pre) scores. Normality of difference scores was assessed using the Shapiro–Wilk test. Because several difference distributions departed from normality, the Wilcoxon signed-rank test was the primary inferential test; paired-samples t-tests are reported for completeness. Effect size was quantified as Cohen's d for paired designs. A two-tailed $\alpha = 0.05$ was used. Analyses were performed in Python (SciPy/NumPy).

4. Results

All 10 female participants completed the intervention. Mean age was approximately 45.5 years (range 18–55).

4.1 Descriptive and inferential statistics

Table 1. Descriptive statistics for outcome measures (n = 10)

Outcome	Time	Mean	SD	Median	Min	Max
Weight (kg)	Pre	71.93	5.17	71.88	61.00	80.70
	Post	68.06	4.79	67.75	57.00	75.20
BMI (kg/m²)	Pre	28.48	2.32	27.90	25.10	32.50
	Post	26.97	2.23	26.60	23.40	30.50
TSH (μIU/mL)	Pre	11.58	9.42	9.67	1.74	34.30
	Post	2.74	1.89	2.71	0.41	6.07
Zulewski score	Pre	6.00	2.00	6.00	3.00	10.00
	Post	1.30	1.16	1.00	0.00	4.00
QOL score	Pre	46.56	14.14	49.76	12.75	59.80
	Post	74.56	12.96	76.91	48.33	88.88
T3*	Pre	69.16	73.01	57.69	0.92	178.00
	Post	58.22	61.21	50.34	0.86	135.80
T4*	Pre	20.45	32.08	10.41	6.20	111.30
	Post	27.17	52.76	9.45	6.81	177.10

*T3 and T4 values appear reported in mixed units across subjects; interpret with caution.

Table 2. Change scores and inferential statistics (n = 10)

Outcome	Mean Δ	SD Δ	Wilcoxon p	t-test p	Cohen's d	Improved
Weight (kg)	−3.88	0.92	0.002	<0.001	−4.23	10/10
BMI (kg/m ²)	−1.51	0.30	0.002	<0.001	−5.06	10/10
TSH (μIU/mL)	−8.85	9.49	0.002	0.016	−0.93	10/10
Zulewski score	−4.70	1.34	0.002	<0.001	−3.51	10/10

QOL score	+28.00	11.07	0.002	<0.001	2.53	10/10
T3*	-10.94	13.98	0.002	0.035	-0.78	—
T4*	+6.72	21.02	0.770	0.339	0.32	5/10

Note: Lower weight, BMI, TSH and Zulewski scores indicate improvement; higher QOL indicates improvement. All primary outcomes (weight, BMI, TSH, Zulewski, QOL) improved in every participant.

4.2 Graphical representation

Figure 1 presents grouped mean $\pm$ SD comparisons for the primary outcomes. Figure 2 shows individual outcome panels.

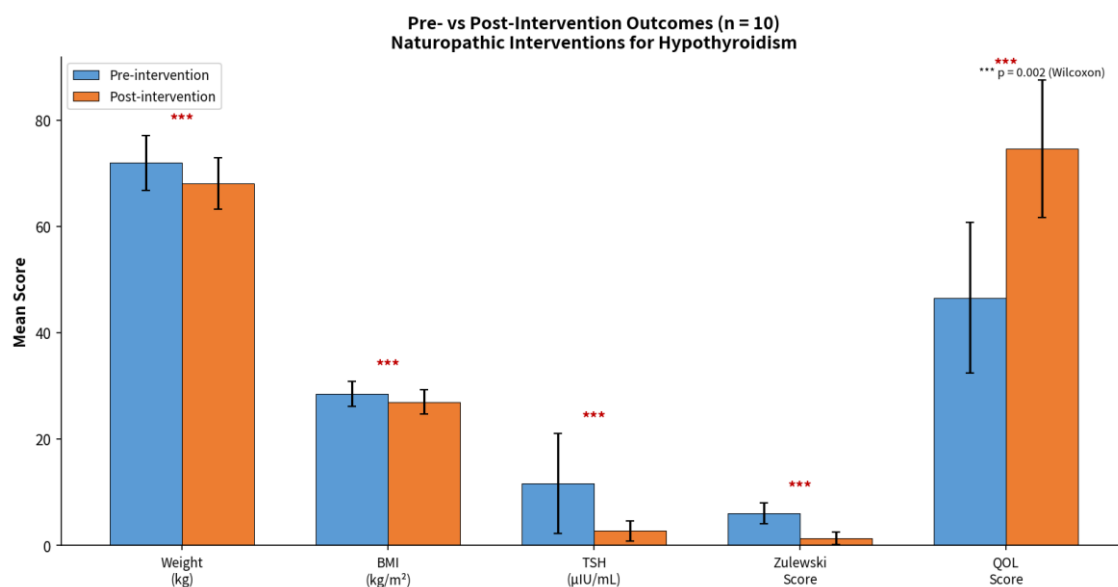


Figure 1. Mean pre- and post-intervention scores ($\pm$ SD) for weight, BMI, TSH, Zulewski score and quality of life. *** $p = 0.002$ (Wilcoxon signed-rank test).

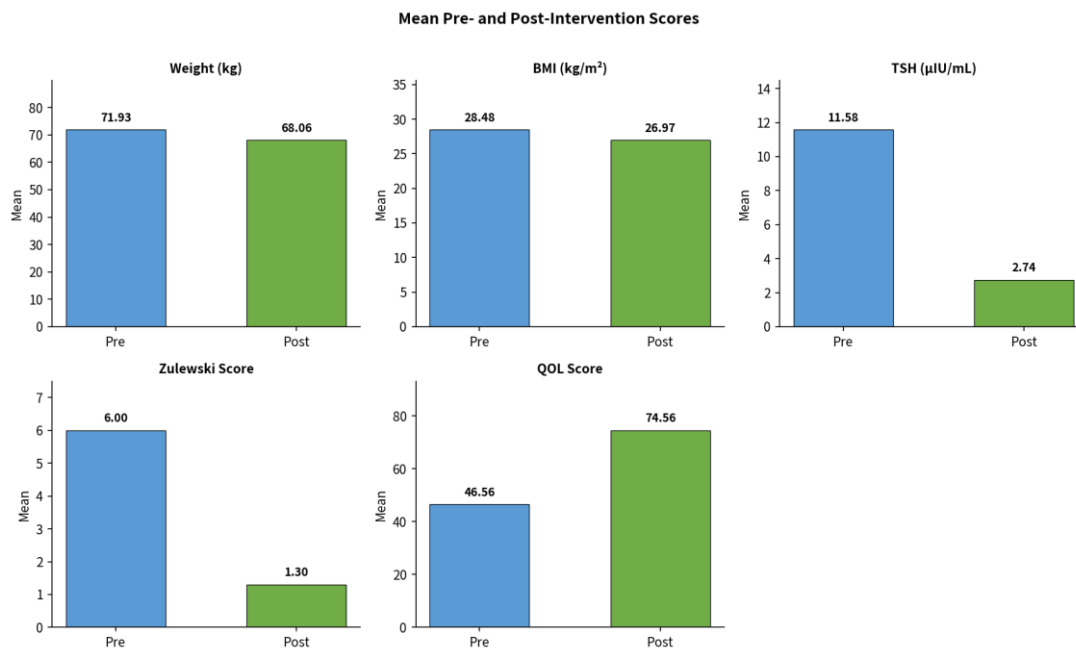


Figure 2. Mean pre- and post-intervention scores for each primary outcome measure.

4.3 Summary of key findings

Weight: Mean reduction -3.88 kg (SD 0.92); Wilcoxon $p = 0.002$; Cohen's $d = -4.23$; 10/10 improved.

BMI: Mean reduction -1.51 kg/m² (SD 0.30); $p = 0.002$; $d = -5.06$; 10/10 improved.

TSH: Mean reduction -8.85 µIU/mL (SD 9.49); $p = 0.002$; $d = -0.93$; 10/10 improved.

Zulewski symptom score: Mean reduction -4.70 (SD 1.34); $p = 0.002$; $d = -3.51$; 10/10 improved.

Quality of life: Mean improvement $+28.00$ (SD 11.07); $p = 0.002$; $d = 2.53$; 10/10 improved.

T3 decreased significantly but should be interpreted cautiously because of mixed units. T4 showed no consistent or statistically significant change.

5. Discussion

In this single-group pre-post pilot study, a 10-day naturopathic intervention protocol was associated with highly significant reductions in body weight, BMI, TSH and clinical symptom burden (Zulewski score), together with a large improvement in quality of life. Every participant improved on these primary measures. Effect sizes were large to extremely large for anthropometrics, symptoms and QOL, and large for TSH.

These findings are consistent with the physiological rationale for the selected modalities. Mud application to the thyroid region and abdominal mud packs may improve local circulation and provide thermal and mechanical stimuli. Hydrotherapeutic procedures (neutral hip bath, steam bath, circular jet, underwater massage) and massage can enhance peripheral circulation, lymphatic drainage and relaxation, potentially reducing stress-related autonomic imbalance. Therapeutic juice fasting and raw diet provide micronutrients while reducing caloric and inflammatory load, which may support metabolic normalisation in overweight hypothyroid patients [6,7].

The marked reduction in mean TSH (11.58 to 2.74 $\mu\text{IU/mL}$) is clinically noteworthy, although the absence of a control group precludes causal attribution solely to the intervention; concurrent medication effects, regression to the mean and short-term dietary change may contribute. The uniform improvement in Zulewski scores and QOL suggests meaningful symptomatic benefit beyond laboratory change alone.

Limitations include the small sample size ($n = 10$), single-sex cohort, lack of a control or sham group, short duration, single-centre design and absence of long-term follow-up. T3 and T4 values appeared to be reported in mixed units, limiting biochemical interpretation of these hormones. Multiple testing was not formally adjusted; however, the primary findings remain significant under conservative correction. Larger randomised controlled trials with standardised hormone assays, longer follow-up and stratification by medication status are required to confirm efficacy and generalisability.

6. Conclusion

Within the limitations of this single-group pre-post study, a 10-day naturopathic intervention combining mud therapy, hydrotherapy, massage and dietary regulation was associated with statistically significant and clinically meaningful improvements in TSH, body weight, BMI, hypothyroid symptom burden and quality of life in women with hypothyroidism. The protocol was well tolerated. These preliminary findings support further evaluation of integrative naturopathic care as an adjunct in the management of hypothyroidism.

Declarations

Conflict of interest: The authors declare that they have no conflict of interest.

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Ethics: Written informed consent was obtained from all participants. The study was conducted as a student dissertation under institutional supervision.

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