

ORIGINAL RESEARCH ARTICLE

Randomized Open Controlled Clinical Study of *Ujjayi Pranayama* in the Management of Hypothyroidism

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ARTICLE INFO

Article history:

Received on: 11-01-2026

Accepted on: 11-02-2026

Published on: 28-02-2026

Key words:

Hypothyroidism,
Thyroid Stimulating Hormone,
Thyroxine,
Triiodothyronine,
Ujjayi Pranayama

ABSTRACT

Swasthya Rakshana is one of the most important aims of Ayurveda. Many of the things that are described in Ayurveda for *swasthya rakshana*, such as *Dinacharya*, *Rutucharya*, and *Sadvritta Yoga vidya*, that is, performing *Yogasana*, *Pranayama*, *Shuddhi Kriya*, and applying its philosophy in daily life, are some other things which are mentioned in *Ayurveda* for *swasthavritta*. The demand for cost-effective form of treatment for hypothyroid is growing. Hypothyroidism is a common condition, with a female: male ratio of 6:1. Iodine deficiencies remain the most common cause of hypothyroidism worldwide. Hypothyroidism is an underactive thyroid gland. *Ujjayi pranayam* contribute in lowering body mass index, thyroid-stimulating hormone, T3, and T4 level help in improving respiratory function. There is a dearth in literature to support the effect of *ujjayi pranayam* on hypothyroidism patient though ancient texts support the view strongly.

1. INTRODUCTION

Ayurveda is an ancient medicinal science having its own basic principles, that is, *Tridosha Sidhanta*, *Samanya Vishesh Shidhanta*, *Swabhavoparam Vada*, and much more. With the help of these valuable and unchangeable *Sidhantas Vaidyas* are successfully treating patients having different types of *Iyadhi*.

Therefore, *Swasthya Rakshana* is also one of the most important aims of Ayurveda. *Yoga vidya*, that is, performing *Yogasana*, *Pranayama*, *Shuddhi Kriya*, and applying its philosophy in daily life, are some other things which are mentioned in *Ayurveda* for *swasthavritta*. However, some of the further studies state that it helps not only in *swasthavritta* but also in some curative treatments. Therefore, the curative approach of such daily practices in *Swasthavritta* should be studied.

Hypothyroidism is a common condition, with a female: male ratio of 6:1. Iodine deficiencies remain the most common cause of hypothyroidism worldwide. Hypothyroidism is an underactive

thyroid gland. Hypothyroidism means that the thyroid gland cannot make enough thyroid hormone to keep the body running normally. People are hypothyroid if they have too little thyroid hormone in the blood.

Hypothyroidism is defined as a clinical state resulting from insufficient secretion of the thyroid hormone from the thyroid gland due to some of the structural or functional impairment of the thyroid hormone production.^[1] The thyroid gland is located inside the neck, just below Adam's apple, and it produces two thyroid hormones, triiodothyronine (T3) and thyroxine (T4), which regulate the body metabolic rate.^[2] Hypothyroidism affects all the organ systems, and main clinical findings are fatigue, weakness, dryness, coarseness of the skin, cold intolerance, swelling of extremities, lack of concentration, memory, constipation, weight gain, menorrhagia, paresthesia, hearing disorder, diffuse alopecia, bradycardia, delayed relaxation of tendon reflexes, carpal tunnel syndrome, and serous cavity effusion.^[3] There are intricate feedback mechanisms between the thyroid and anterior pituitary. Hypothyroidism is classified as primary when T4 and T3 levels are low, but levels of thyroid-stimulating hormone (TSH) secreted by the anterior pituitary high.^[4] It is classified as secondary when TSH is low, and T4 and T3 levels are high, and presents a large epidemiological burden in India.^[5] Imbalance in the production of TSH

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or the hypothalamus, which regulates the pituitary gland via thyrotropin-releasing hormone.^[6] Thyroid disorders can range from a small, harmless goiter (enlarged gland) that needs no treatment to life-threatening cancer.^[7] The most common thyroid problems involve abnormal production leads to hypothyroidism, as the result of subtle and non-specific clinical symptoms and signs, the condition often goes undiagnosed and is not adequately treated when it is detected.^[8] There is heterogeneity in the diagnostic and treatment approaches to hypothyroidism.^[9] As a result of the physiological changes in thyroid hormones with age and illness, it is important to tailor the diagnosis and management of this condition in specific populations, including pregnant women, infants, children, geriatric patients, and those with comorbid conditions.^[10]

1.1. Yoga

Yoga is an art and science of healthy living. The word “Yoga” is derived from the Sanskrit root “Yuj,” meaning “to join” or “to yoke” or “to unite.” As per Yogic scriptures the practice of Yoga leads to the union of individual consciousness with that of the Universal Consciousness, indicating a perfect harmony between the mind and body, Man and Nature.^[11] The aim of Yoga is self-realization, to overcome all kinds of sufferings leading to “the state of liberation” (*Moksha*) or “freedom” (*Kaivalya*). Living with freedom in all walks of life, health, and harmony shall be the main objectives of Yoga practice. “Yoga” also refers to an inner science comprising of a variety of methods through which human beings can realize this union and achieve mastery over their destiny.^[12] Yoga, being widely considered as an “immortal cultural outcome” of Indus Saraswati Valley civilization dating back to 2700 B.C., has proved itself catering to both material and spiritual upliftment of humanity. Basic humane values are the very identity of Yoga Sadhana. Yoga is also commonly understood as a therapy or exercise system for health and fitness. While physical and mental health is natural consequences of yoga, the goal of yoga is more far-reaching.^[13] “Yoga is about harmonizing oneself with the universe. It is the technology of aligning individual geometry with the cosmic, to achieve the highest level of perception and harmony.”

1.2. Ujjayi Pranayama – The Psychic Breath

Ujjayi Pranayama, or the psychic breath, soothes the mind and induces a meditative state. *Ujjayi* means to “lift up.” In *Ujjayi* pranayama, the chest is slightly lifted up as if the inhalation is done from the throat. *Ujjayi pranayama* is mentioned in the yoga text *Hatha Yoga Pradeepika* and in the *Gheranda Samhita*. The Procedure of *Ujjayi* pranayama or Psychic breathing according to *Gheranda Samhita*:

- Sit in a comfortable meditative pose, *Siddhasana* or *Swastikasana*, or *Vajrasana*
- Contract the glottis so that the passage of the throat is partially closed
- Roll the tongue up and let the lower side of the tongue touch the upper palate
- Breath in slowly through the throat, making a slight hissing snoring sound
- When the inhalation is complete, swallow the breath and perform *Jalandhara Bandha* (the chinlock)
- Retain the breath inside for as long as you are comfortable
- Release the chin lock (*Jalandhara Bandha*) and exhale through both nostrils.
- This is one round of *Ujjayi Pranayama*. Do as many rounds as comfortable for 15 Benefits of *Ujjayi Pranayama*.^[8]

The current study focuses on *Ujjayi pranayama* on adult hypothyroidism and its impact on body mass index (BMI) and thyroid function test.

Thus, *Ujjayi* is considered as supportive and complimentary therapy in conjunction with medical therapy for the treatment of hypothyroid disorder. Although *Ujjayi* pranayama is being widely used as a yoga therapy for various diseases in Yogic system of medicine, to the best of our knowledge, there is a lack of scientific evidence in reporting the effect of *Ujjayi* pranayama on adult Hypothyroidism. Hence, the rationale is to observe the changes in BMI and thyroid profile in adult hypothyroidism.

While yoga may not be able to instantly cure the condition, it can keep the glands healthy, regulate metabolism, and prevent further complications. In a study, 6 months of intense yoga practice helped women with hypothyroidism and reduced their need for T4 medication.

The fourth of the eight rungs of Yoga is Pranayama, which is regulating the breath so as to make it slow and subtle, leading to the experience of the steady flow of energy (prana), which is beyond or underneath exhalation, inhalation, and the transitions between them.

1.3. Need of Study

The most effective pranayama for thyroid problems is *Ujjayi pranayama*. It works on the throat area, reducing hyper- and hypothyroidism. Its healing effect is due to the stimulation of reflex pathways within the throat area, which in turn activates the thyroid gland. This practice also gives us direct access to the pranic and psychic network, the substructure of metabolic activity. The prevalence of hypothyroidism in India is 11%, compared with only 2% in the UK and 4.6% in the USA. This pranayama, called *Ujjayi*, can be practiced while sitting, standing, or even walking. It removes swelling due to water retention and any ailments of the stomach and the nervous system.

1.4. Objectives

1.4.1. Primary objective

The objective of the study was to study the effect of *Ujjayi pranayama* in the management of hypothyroidism.

1.4.2. Secondary objective

1. To study the *Ujjayi Pranayama* in detail from *Yogashastra* texts.
2. To study the hypothyroidism in detail.
3. To study the curative aspect of *Ujjayi pranayama*.

2. METHODOLOGY

2.1. Method of Selection of Subjects

2.1.1. Inclusion criteria

4. Patients who are diagnosed as hypothyroidism
5. Patients of hypothyroidism presenting features as per modern text
6. Patients of age group 21–50 years undergoing treatment
7. Patients irrespective of gender and from different socioeconomic group were selected.

2.1.2. Exclusion criteria

1. Patients who are seriously ill and have altered sensorium
2. Pregnant woman, lactating mother
3. Patients with malignancy of any organ
4. K/H/O appendicitis was excluded from study
5. Female suffering from severe menorrhagia was excluded from study.

2.1.3. Withdrawal criteria

1. Occurrence of Serious adverse events of any cause
2. The investigator feels that the protocol has been violated or the patient has become uncooperative. Further continuation of the study is likely to be detrimental to the health of the patients

- Patients absent for continuous 2 days were considered as dropped out from this project.

2.2. Methods of Measurement

2.2.1. Subjective criteria

Assessment was done on the basis of improvement in the clinical conditions of the patients, that is, relief in the signs and symptoms and laboratory investigation.

- Constipation
- Dry skin
- Sensitivity to cold
- Sluggishness
- Myalgia.

2.2.2. Objective criteria

- Body weight
- Bradycardia.

2.2.3. Laboratory investigation

- Serum TSH
- T3
- T4.

3. OBSERVATIONS AND RESULTS

3.1. Observations

Most of the patients in this clinical study were from 41 to 50 years age group (51.66%), followed by 31–40 years age group (41.66%).

In this study, maximum patients were female 56.66% whereas male patients were 43.33%.

All the patients were selected irrespective of religion. Maximum number of patients 78.33% were Hindu, followed by Muslim patients were 21.66%.

In this study, maximum patients were married (85%) whereas 15% of patients were unmarried.

In this study, 41.66% patients were from middle class, whereas 40% patients were from the higher class, followed by 16.66% in the lower class.

Out of 60 patients, most of the patients were serviceman 41.66%, followed by 35% patients were business, and 23.33 were household worker.

In this study, 60% and 63.33% of patients were consuming a mixed diet in group A and B, respectively, whereas 40 and 36.66% patients were vegetarian in group A and B, respectively.

In 60 patients, 21.66% patients having Kapha-Vata Prakruti, 20% patients were having Vata – pitta prakruti, whereas 18.33% patients Kapha-Vata.

In the present clinical study, it has been revealed that majority of the patients (68.33%) were having Mandagni, 18.33% of patients were having Vishamagni, and 13.33% of patients were having Tikshnagni.

Out of 60 patients, 66.66% patients were having madhyam Satva and 20% patients having avara Satva.

Out of 60 patients, 68.33% patients were having disturbed sleep and 31.66% patients having sound sleep the details are given in table 1-11 and graph 1-11.

4. DISCUSSION

4.1. Age

Most of the patients in this clinical study were from 41 to 50 years age group (51.66%), followed by 31–40 years age group (41.66%). In the age group of 31–40 years, and 41–50 years, people are used to do irregularities in their dietetic as well as lifestyle habits, addiction to different things because of their busy work schedule, and anxiety more prone to develop Hypothyroidism.

4.2. Sex

In this study, maximum patients were female 56.66% whereas male patients were 43.33%. Hypothyroidism is a very common condition and affects more women than men.

4.3. Religion

All the patients were selected irrespective of religion. Maximum number of patients 78.33% were Hindu, followed by Muslim patients were 21.66%.

4.4. Marital Status

Since the disease affects more in middle age persons which is the age when generally a person get married, and also due to anxiety, stressful life anger, jealousy, family burden, etc. Hence, in this study, the maximum number of patients were married (85%), whereas 15% of patients were unmarried.

4.5. Economic Status

In this study, 41.66% patients were from the middle class, whereas 40% patients were from higher class, followed by 16.66% in the lower class.

4.6. Occupation

Out of 60 patients, most of the patients were serviceman 41.66%, followed by 35% patients were business, and 23.33 were household worker.

4.7. Diet

In this study, 60% and 63.33% of patients were consuming a mixed diet in Group A and B, respectively, whereas 40 and 36.66% patients were vegetarian in group A and B, respectively.

4.8. Effect on Symptoms

- In Pranayam with medication group, the symptom constipation has been statistically reduced by 68.89%, dry skin 68.33%, sensitive to cold 88.33%, sluggishness 70%, and Myalgia by 78.33%. In objective parameters, weight reduction by 2.11% and TSH value by 95.4%.
- In medication only group, the symptom constipation has been statistically reduced by 46.11%, dry skin 42.78%, sensitive to cold 53.33%, sluggishness 65% and Myalgia by 50%.

In objective parameters, weight reduction by 0.82% and TSH value by 96.02% shown in graph 12-18 below.

4.9. Overall Improvement

In group “A”, 63.33% patients have got complete improvement, 26.66% patients having marked improvement, 3.33% patients

having moderate improvement, and 6.66% patients having mild improvement. In group “B”, 13.33% patients were having complete improvement, 30% patients having marked improvement, 43.33% patients having moderate improvement, and 13.33% patients having mild improvement. From a clinical study, it is clear that “*Pranayam* with Medication Group provides better results in comparison to only medication group in hypothyroidism.

5. CONCLUSION

1. The present clinical study has been undertaken to evolve the *Ujjayi pranayama* as a treatment and to see the efficacy of it hypothyroidism with a control group as regular medicine
2. *Ujjayi pranayama* with medication shows more results in sign and symptoms of hypothyroidism
3. Both the group shows equal results in reduction of weight and TSH value.

From this clinical study, it can be concluded *Ujjayi pranayama* plays definite role in treating hypothyroidism.

6. ACKNOWLEDGMENTS

Nil.

7. AUTHORS' CONTRIBUTIONS

All authors give equal contribution in making of this manuscript.

8. FUNDING

Nil.

9. ETHICAL STATEMENT

Ethical approval was not required for this study.

10. CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this paper.

11. DATA AVAILABILITY STATEMENT

The data analyzed in this review were obtained from publicly available sources, including peer-reviewed articles, observational studies, and surveys accessible through databases.

12. PUBLISHERS NOTE

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How to cite this article:

Kodag S, Godbole M, Shende K. Randomized Open Controlled Clinical Study of *Ujjayi Pranayama* in the Management of Hypothyroidism. *IRJAY*. [online] 2026;9(2):11-19.

Available from: <http://irjay.in>

DOI link- <https://doi.org/10.47223/IRJAY.2026.90203>

Table 1: Distributions of 60 patients according to age

S. No.	Age (Years)	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	21–30	02	6.66	02	6.66	04	6.66
2.	31–40	14	46.66	11	36.66	25	41.66
3.	41–50	14	46.66	17	56.66	31	51.66

Table 2: Distributions of 60 patients according to sex

S. No.	Sex	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	Male	12	40	14	46.66	26	43.33
2.	Female	18	60	16	53.33	34	56.66

Table 3: Distributions of 60 patients according to religion

S. No.	Religion	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	Hindu	24	80	23	76.66	47	78.33
2.	Muslim	06	20	07	23.33	13	21.66

Table 4: Distributions of 60 patients according to marital status

S. No.	Marital status	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	Unmarried	03	10	06	13.33	09	15
2.	Married	27	90	24	86.66	51	85

Table 5: Distributions of 60 patients according to income

S. No.	Income group	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	Lower	06	20	04	13.33	10	16.66
2.	Middle	12	40	13	43.33	25	41.66
3.	Higher	11	36.66	13	43.33	24	40

Table 6: Distributions of 60 patients according to occupation

S. No.	Occupation	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	Household Worker	06	20	08	26.66	14	23.33
2.	Service	13	43.33	12	40	25	41.66
3.	Business	11	36.66	10	33.33	21	35

Table 7: Distributions of 60 patients according to diet

S. No.	Diet	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	Veg	12	40	11	36.66	21	35
2.	Mixed	18	60	19	63.33	37	61.66

Table 8: Distributions of 60 patients according to Prakruti

S. No.	Prakruti	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	Vata Pitta	06	20	06	20	12	20
2.	Pitta Kapha	04	13.33	03	10	07	11.66
3.	Kapha Pitta	07	23.33	06	20	13	21.66
4.	KaphaVata	05	16.66	06	20	11	18.33
5.	Pitta Vata	04	13.33	05	16.66	09	15
6.	Vatakapha	04	13.33	04	13.33	08	13.33

Table 9: Distributions of 60 patients according to Agni

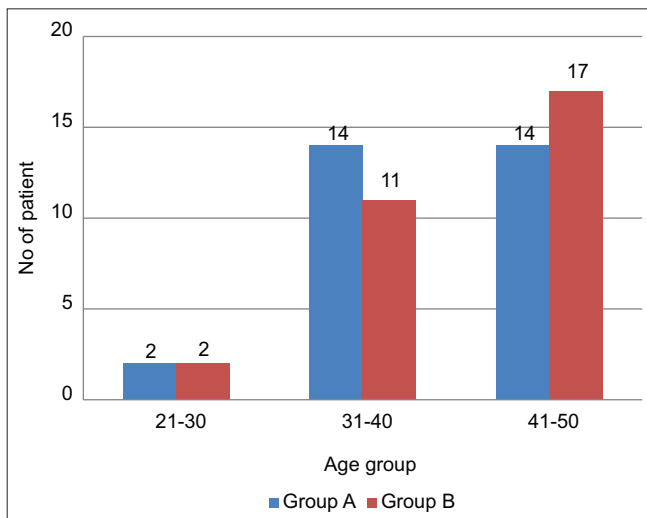
S. No.	Agni	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	Mandya	21	70	20	66.66	41	68.33
2.	Visham	06	20	05	16.66	11	18.33
3.	Tikshna	03	10	05	16.66	08	13.33

Table 10: Distributions of 60 patients according to Satva

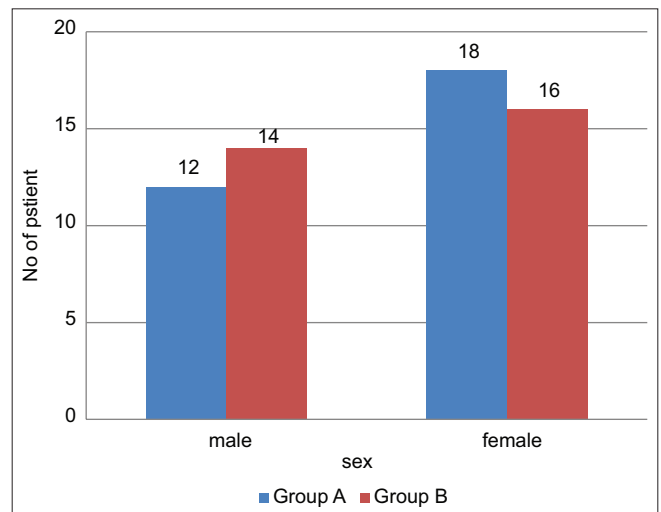
S. No.	Satva	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	Avara	07	23.33	05	16.66	12	20
2.	Madhyam	19	63.33	21	70	40	66.66
3.	Pavara	04	13.33	04	13.33	08	13.33

Table 11: Distributions of 60 patients according to sleep

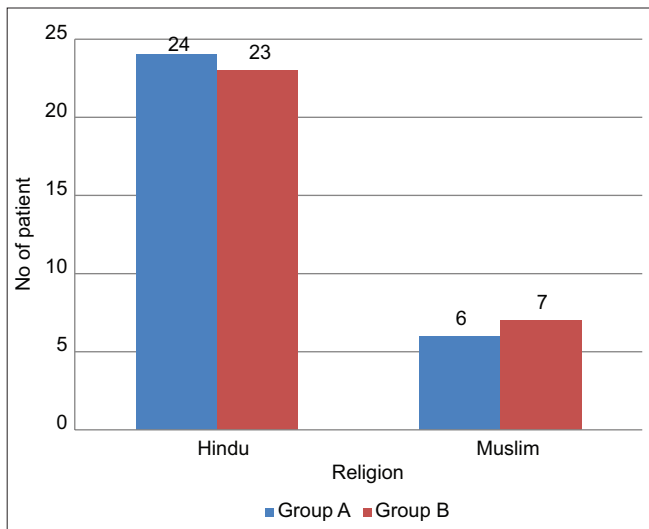
S. No.	Sleep	Group A		Group B		Total	
		No. of patients	Percentage	No. of patients	Percentage	No. of patients	Percentage
1.	Sound	09	30	10	33.33	19	31.66
2.	Disturbed	21	70	20	66.66	41	68.33



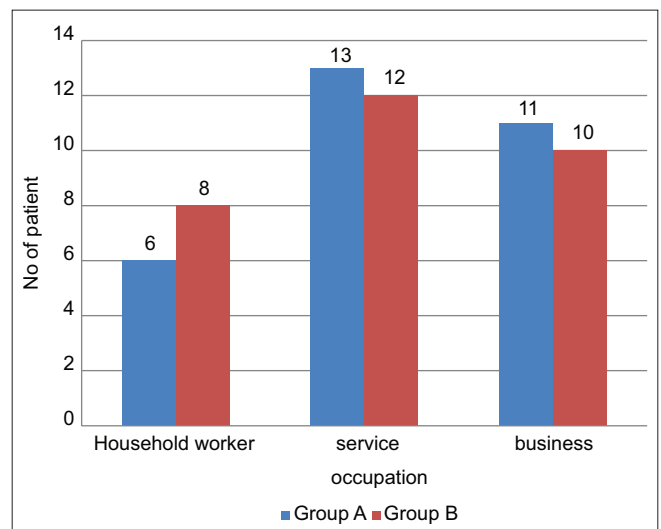
Graph 1: Group-wise distributions of 60 patients according to age



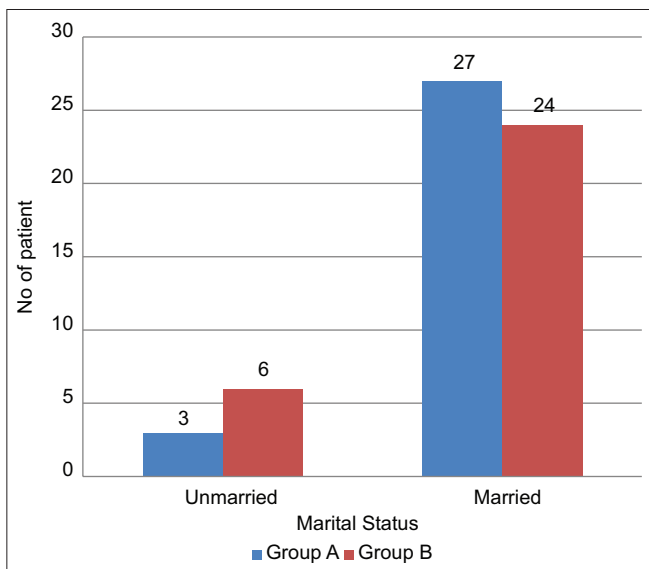
Graph 2: Group-wise distributions of 60 patients according to sex



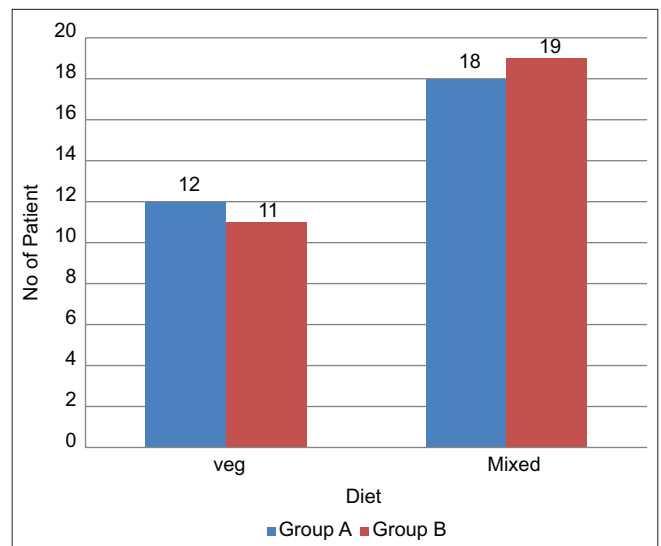
Graph 3: Group-wise distributions of 60 patients according to religion



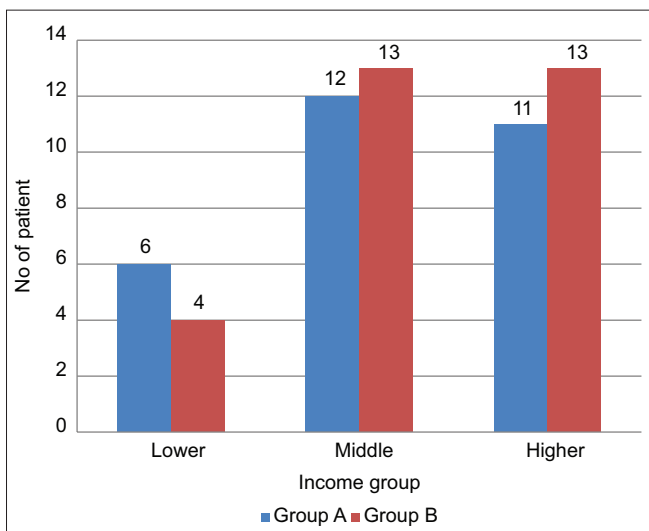
Graph 6: Group-wise distributions of 60 patients according to occupation



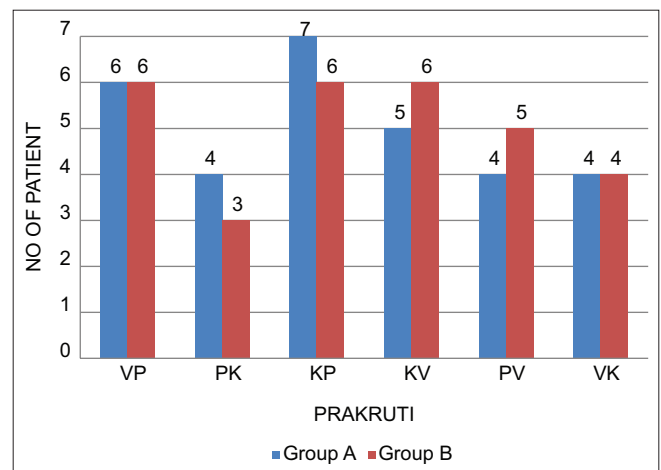
Graph 4: Group-wise distributions of 60 patients according to marital status



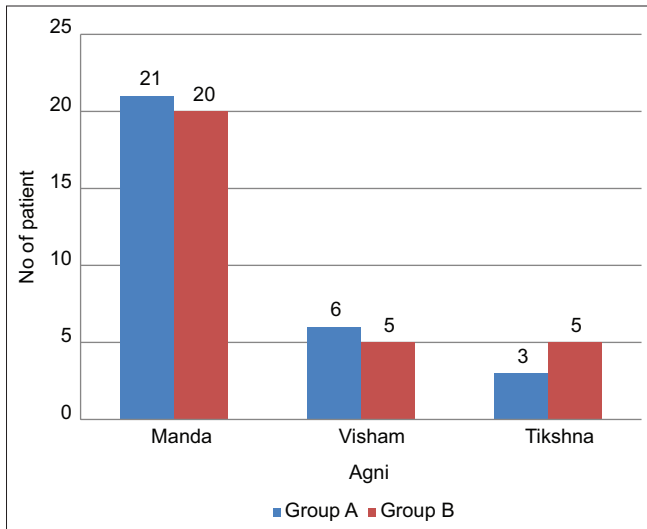
Graph 7: Group-wise distributions of 60 patients according to diet



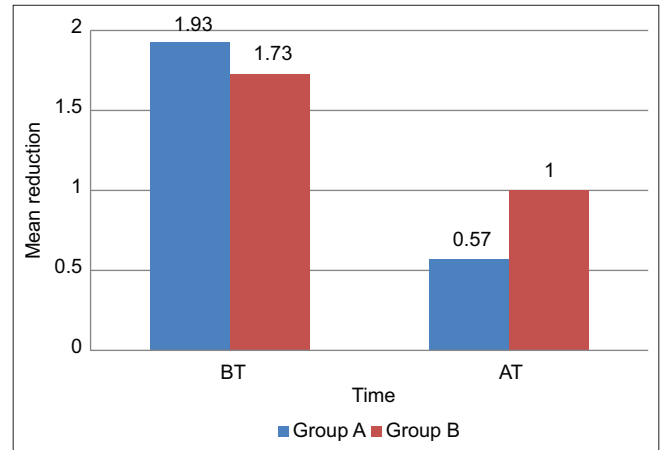
Graph 5: Group-wise distributions of 60 patients according to income group



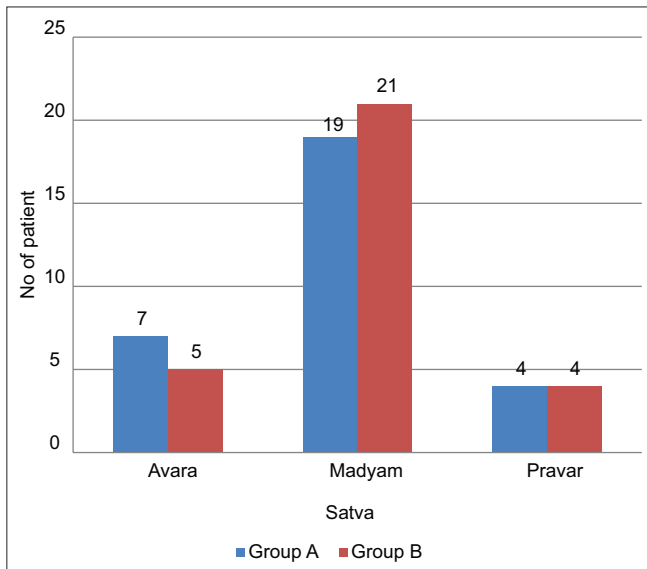
Graph 8: Group-wise distributions of 60 patients according to Prakruti



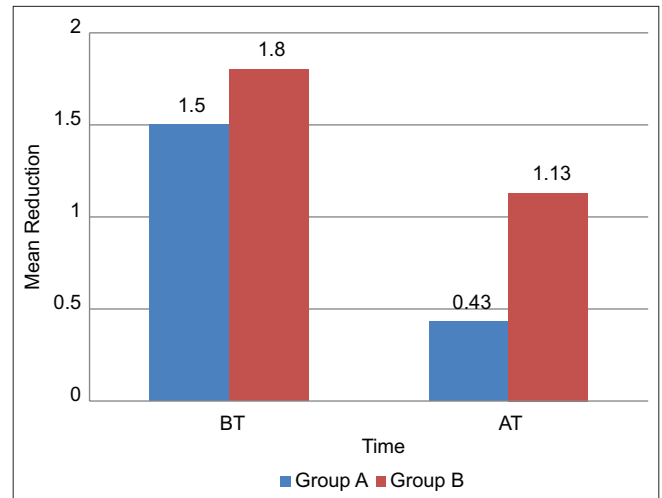
Graph 9: Group-wise distributions of 60 patients according to Agni



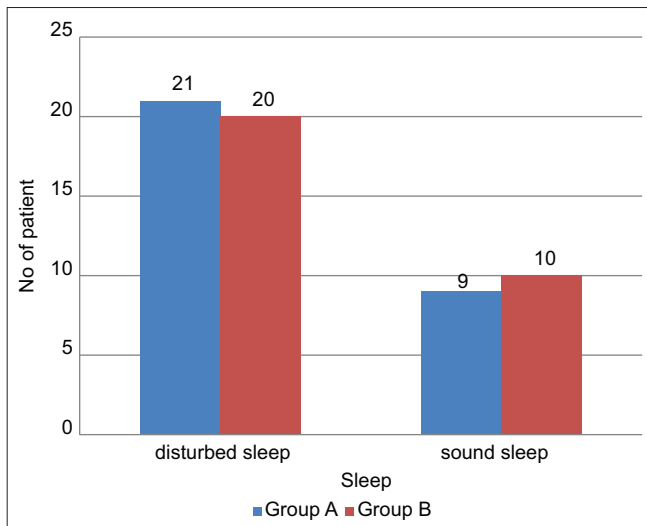
Graph 12: Reliefs in Symptom Constipation.



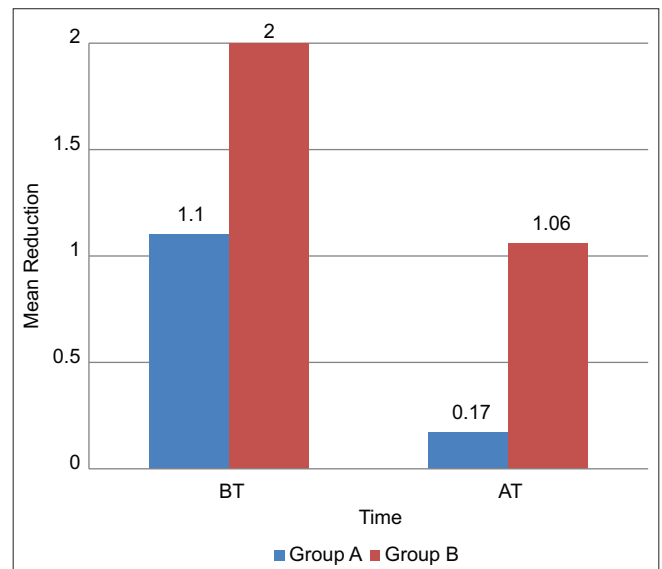
Graph 10: Group-wise distributions of 60 patients according to Satva



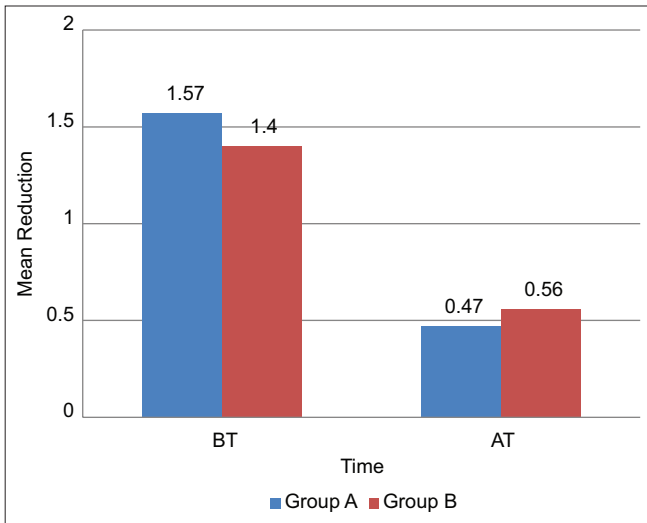
Graph 13: Reliefs in Symptom Dry Skin.



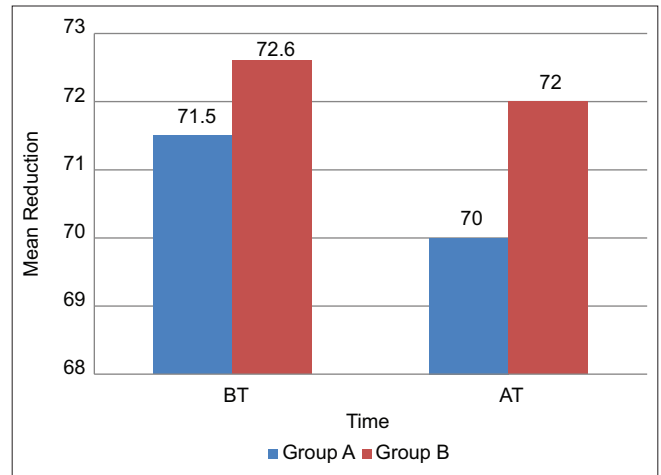
Graph 11: Group-wise distributions of 60 patients according to sleep



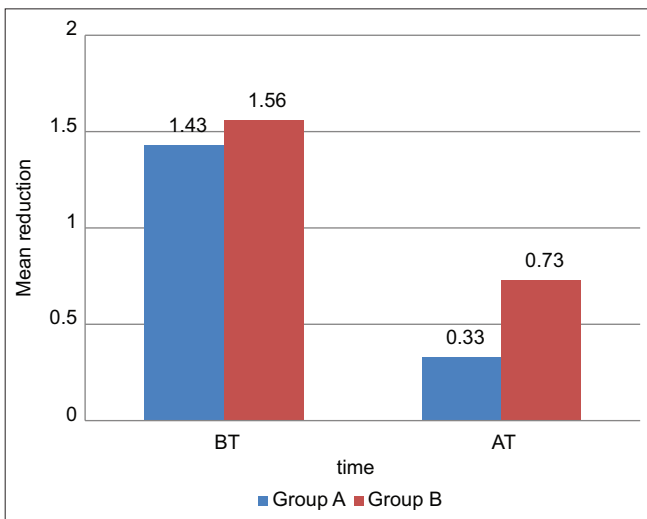
Graph 14: Reliefs in Symptom Sensitive to cold.



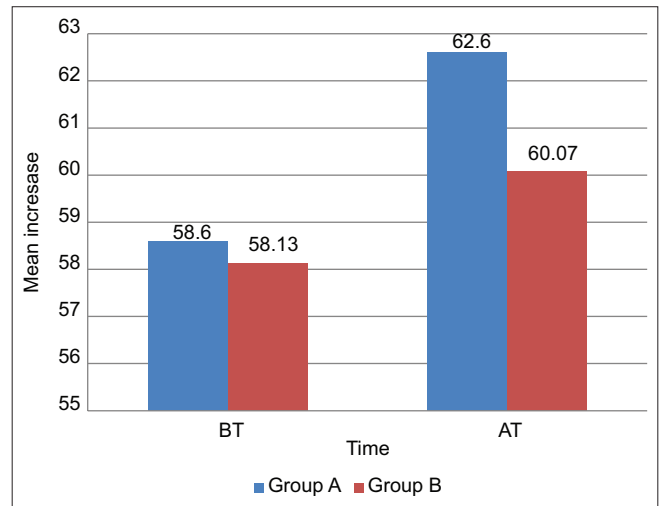
Graph 15: Reliefs in Symptom Sluggishness.



Graph 17: Reliefs in Symptom Weight.



Graph 16: Reliefs in Symptom Myalgia.



Graph 18: Effect in Symptom Bradycardia.