Pravara Med Rev; September 2025, 17 (03), 66 - 72
DOI: 10.36848/PMR/2025/55499.87755

Original article

Role of Yoga Practice on Depression and Self-esteem among Women with Hypothyroidism

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Abstract

Hypothyroidism is one of the most common endocrine disorders in which the thyroid gland is underactive. It is characterized by a deficiency of thyroid hormones, which results insluggish metabolism, weight gain, intolerance to cold, fatigue, and depression, which affect the quality of life.It was hypothesized that regular yoga practice would lead to substantial differences in selected psychological characteristics such as depression and feelings of low self-esteem in women with hypothyroidism.Therefore, the aimwas to study the impact of yoga practice on depression and self-esteem among women with hypothyroidismusing a quasi-experimental pretest - posttest control group design.A total of 60 women with hypothyroidism in the age group of 20- 39 years were selected for the presentstudy. They were divided into experimental and control groups, with each consisting of 30 subjects.The psychological questionnaire measuring scale was used to quantify depression and self-esteem. The duration of the yoga practice session was 16weeks. The experimental group practicedyoga for the entire period of 16weeks, one hour in the morning, for five days a week. The control group maintained a routine lifestyle without yoga practice. Both groups continued their medications throughout the study. For both groups, pre- and post-tests were given. The data was analyzed using analysis of covariance (ANCOVA).The present study revealedthat depression was reduced and self-esteem improved significantlyin the experimental group as a result of yoga practice when compared to the control group.

Key words: *Yoga Practice, Yoga asanas,Depression, Self-esteem, Hypothyroidism.*

Introduction

The thyroid is a butterfly-shaped gland found in the anterior region of the neckthat releasesthyroid hormones suchasthyroxine (T4) and triiodothyronine (T3)[1]. Thyroid hormones function as a fundamental system in homeostasis because they control metabolic activities together with body growth and energy regulation[2].Hypothyroidism refers to theinsufficient production of thyroid hormones by the thyroid gland. It could be due tofailure of the thyroid gland,called primary hypothyroidism, which accounts for99 % of all hypothyroid cases,or failure ofstimulation of the thyroid bythe hypothalamus or pituitary, called central hypothyroidism, which is about one percent[3]. The major causes of hypothyroidism areiodine deficiency in the diet, surgical removal ofthe thyroid gland, chronic lymphocytic thyroiditis(Hashimoto's thyroiditis), postpartum thyroiditis, radioiodine thyroid ablation, and medication like amiodarone and lithium [4]. The prevalence of hypothyroidism in India is about 11% against five percent in western countries. The prevalence shows genderspecificity as females are more affected than males in the six-to-one ratio,besidesmiddle-aged and older women beingmuch more affected [5-7].

Metabolic sluggishness in hypothyroidism leads to clinical manifestations like weight gain, fatigue, dry skin, cognitive impairment, intolerance to cold, and depression, which affect the quality of life [8].Women who have hypothyroidism encounter substantial deterioration of their mental health together with depression, anxiety, and diminished self-confidence[9].Management of hypothyroidism needs hormone replacement therapy with synthetic levothyroxine (LT4) to achieve an euthyroid state.[10, 11]. Biochemical euthyroidismoccurs, but regular and prolonged intake of this medication leads to drug dependency and side effects, which,in turn, negatively affect the quality of life[12].Hence, there is a need to look for alternative approaches in the management of hypothyroidism.

Yoga,an ancient yogic practice involvingstructured body positions with breathing and meditation techniques, serves asone of the best alternative approaches in the management of hypothyroidism [13].The practice of yoga is becoming more and more acknowledged as an adjunctive treatment for hypothyroidism, especially in females. According to recent studies, the practice of yoga is found to be useful in people with hypothyroidism in managing their endocrine system, lowering stress levels, and enhancing their general well-being[14, 15].The practice of yoga improves bodily flexibility and muscle strength as well as cardiovascular health [16].Various yoga poses have been linked to improved thyroid functions, namely,*Sarvangasana* (shoulder stand), *Matsyasana* (fish pose), and *Ustrasana* (camel pose). They stimulate thyroid function through improved blood flow to the thyroid gland[17].Previous studies focused on middle-aged hypothyroid women, but the present study focused on young women. The present study aimed to assess the effect of yoga practices on depression and self-esteem in women with hypothyroidism using a quasi-experimental pretest-posttest control group design.

Materials and methods

Study subjects

A total of 60womenwith hypothyroidism in the age group of 20- 39 years were recruited from Dr. Durga Prasad Shakthi clinic, Chennai, Tamil Nadu, India, between 2023 and 2024.Before participating, each individual was explained about the study and obtained informed consent. The study was approved by the Institutional Human Ethics Committee (IHEC) (MAHER/IEC/PhD/34/FEB24).

Inclusion criteria

Women aged 20 to 39 years with a clinical diagnosis of hypothyroidism with depression and low self-esteem. Participants were willing to participate in the 16-week yoga intervention program. Hypothyroid women who were not practicing yoga or any other form of physical exercise.

Exclusion criteria

Hypothyroid women withserious psychiatric illness,thyroid cancer, thyroid nodules, Hashimoto's thyroiditis, diabetes, cardiac illness, hypertension, arthritis, hernia, and pregnancy. Subject who recently underwent surgery in general or related to the thyroiddisorders.Hypothyroid women who were already practicing yoga or any other form of physical exercise.

Evaluation of psychological status

To measure changes in mental well-being, both groups were examined before (pretest) and after (posttest) the intervention with standardized psychological scales - Beck Depression Inventory (BDI) for depression and Rosenberg Self-Esteem Scale (RSES) for self-esteem.The BDI containeda standardized questionnaire for the evaluation of depression. It hada total of 21questions and the highest possible score of 63.Normal was indicated by a score from0.0 to 10; mild mood disturbance:11to16;borderline depression:17-20;moderate depression: 21-30; severe depression:31-40; andextreme severe depression:above40. The RSES scale had two methods of scoring. It had a total of 10 questions. Five questionshad forward scoring, while anotherfive questions had reverse scoring. The lowest score was 4-5, and the highest score was25-30.

Study design

Subjects were screened and selected as per inclusion and exclusion benchmarks. The study subjects (n=60) were divided intoexperimental (n=30) and control groups (n=30).Their psychological status was evaluated for the pretest using BDI and RSES.The experimental group was sensitized and given adequate training for yoga practice. The duration of the yoga practice session was 16 weeks. The experimental group practiced yoga for the entire duration of

16 weeks: one hour in the morning for five days a week.During the 16-week intervention, the experimental group practiced Yoga *asanas* (postures), *Pranayama (breathing technique)* and *YogaNidra* (relaxation technique).

The details of yoga practice and their duration of practice were: i. Starting with chanting *Aum* mantra for two minutes; ii. Loosening exercise with *Pawanamuktasana* series one(wind releasing sequence one) for 10 minutes; iii. *Surya namaskar*(sun salutation) for six minutes; iv. Yoga*asanas* for 20 minutes. The yoga*asanas* included *Ustrasana* (camel pose), *Balasana* (child pose), *Ardha chakrasana* (standing backward pose), *Setubanasana* (bridge pose), *Sarvangasana*(shoulder stand pose), *Viparetakarani*(leg up the wall pose), *Halasana* (plow pose), *Matsyasana* (fish pose), *Bhujangasana* (cobra pose), *Dhanurasana* (bow pose), and *Shavasana* (corpse pose). v. *Pranayama* for 10 minutes. The *Pranayama*(breathing technique) included *Bhastrika*(bellows breathing), *Kapalbathi*(skull shine breathing), *Ujjayi*(victorious breathing), *and Nadi shodhana*(alternate nostril breathing). vi. Yoga *Nidra*(Relaxation);vii. Finishingby chanting *Aum* mantra for two minutes[18-26]. The control group continued their normal lifestyle without anyyoga intervention.Both experimental and control groups continued their medication throughout the study. Their psychological status was evaluated for the posttest using BDI for depression and RSES for self-esteem.

Statistical analysis

The data was processed using analysis of covariance (ANCOVA) in SPSS (version 27), keeping depression and self-esteem as dependent variables while yoga practice as the independent variable. A degree of confidence of 0.05 or less than that was used for the significance.

Results

Depression

In the pretest, the mean depression score of the experimental group ($\bar{x}$ = 23.8) was slightly lower than that of the control group ($\bar{x}$ = 26.0), but the difference was not statistically significant (F = 1.9; p> 0.05), suggesting that at baseline both groups had comparable levels of depression before the intervention. In the post-test, after the yoga intervention, the experimental group showed a significant reduction in depression scores ($\bar{x}$ = 19.5), whereas the control group remained nearly unchanged ($\bar{x}$ = 25.8). The between-group difference was statistically significant (F = 28.03;p< 0.001), indicating that yoga had a notable impact on reducing depression. After adjusting for covariates, the adjusted mean depression score for the experimental group was 20.2, while the control group remained higher at 25.0. The ANCOVA results showed a highly significant difference between the groups (F = 80.51, p< 0.001), confirming that yoga was an effective intervention for reducing depression in women with hypothyroidism.

Self-esteem

In the pre-test, the mean self-esteem score of the experimental group ($\bar{x}$ = 11.5) was slightly higher than that of the control group ($\bar{x}$ = 11.13), but the difference was not statistically significant (F = 0.22;p> 0.05), indicating that both groups had comparable levels of self-esteem before the intervention.In the post-test, after the yoga intervention, the experimental group showed a notable improvement in self-esteem ($\bar{x}$ = 15.2), while the control group remained nearly unchanged ($\bar{x}$ = 11.06). The between-group difference was statistically significant (F = 24.68; p< 0.001), indicating that yoga had a substantial impact on enhancing self-esteem.After adjusting for covariates, the adjusted mean self-esteem score for the experimental group was 15.03, while the control group remained lower at 11.2. The ANCOVA results confirmed a highly significant difference between the groups (F = 61.61;p< 0.001), reinforcing that yoga was an effective intervention in improving self-esteem.The mean gain in self-esteem scores was 3.6 points in the experimental group, compared to only 0.06 points in the control group, demonstrating the effectiveness of yoga practice in enhancing self-esteem among women with hypothyroidism.

Table 1. Shows pre-test and post-test measure for the study subjects on depression

Test	Exp GP	Control GP	SV	SS	DF	MS	F
Pre test	23.8	26	Between	34.13	1	34.1	1.9
			within	501.7	28	17.9	
Post test	19.5	25.8	between	294.5	1	294.5	28.03
			within	294.1	28	10.5	
Adjusted	20.2	25.0	between	161.1	1	161.1	80.51
			within	54.0	27	2.0	
Mean Gain	4.3	0.2					

EXP GP: Experimental group; CON GP: Control group; SV: Schedule variance;SS: Sum of Squares; DF: Degree of freedom; MS: Mean square; F; Distribution

Figure 1. Shows pre-test and post-test measures for the study subjects on depression

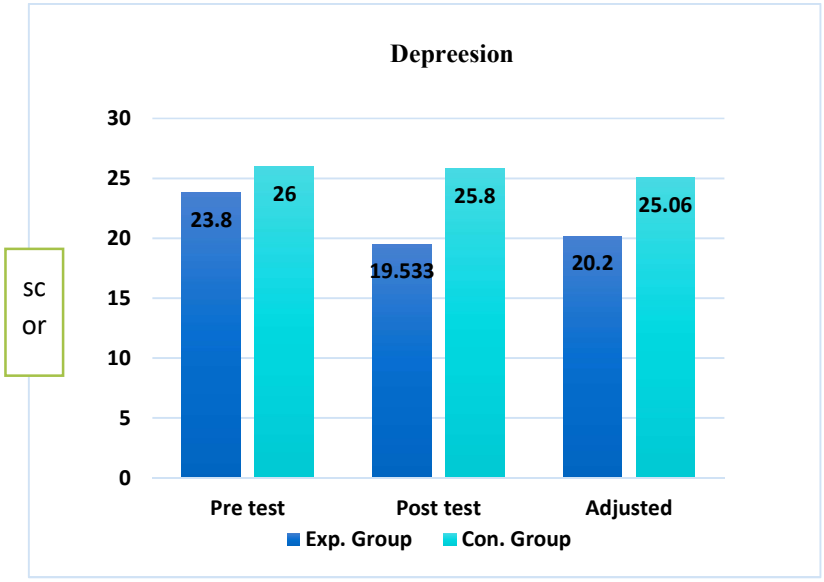
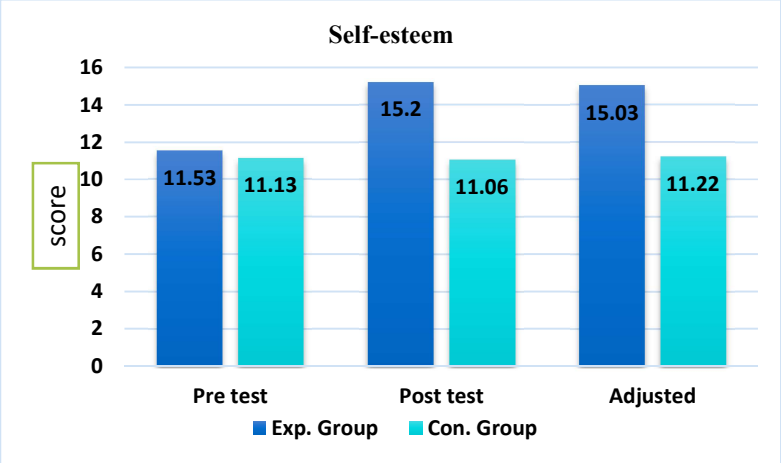


Table 2. Shows pre-test and post-test measure for the study subjects on self- esteem

Test	Exp GP	Control GP	SV	SS	DF	MS	F
Pre test	11.5	11.13	between	1.2	1	1.2	0.22
			within	147.46	28	5.26	
Post test	15.2	11.06	between	128.13	1	128.13	24.68
			within	145.33	28	5.19	
Adjusted	15.03	11.2	between	107.8	1	107.8	61.61
			within	47.25	27	1.74	
Mean gain	3.6	0.06					

EXP GP: Experimental group; CON GP: Control group; SV: Schedule variance; SS: Sum of Squares; DF: Degree of freedom; MS: Mean square; F; Distribution

Figure 2. Shows pre-test and post-test measure for the study subjects on self- esteem



Discussion

Yoga is an ancient yogic science that, with regular practice,promotes the physical, mental, emotional, and spiritual well-being of the individual [20, 22].In the present study, the experimental group was given selected yoga practices. According to the available literature, the yoga practices employed in the present study have huge benefitsfrom regular practice. For instance, chanting *Aum*results ina gentle massage for the throat, sternum, and chest anda smoothening of the thyroid gland [21].*Pawanamuktasana series*onehelps synchronize with breath,strengthen the joints and enhance their suppleness, and fortify the muscles that support the joints [22]. The regular practice of *Surya namaskar* assists in the preservation of an adequate level of metabolism, which is beneficialto the thyroid gland [19]. Yoga *asanas*have an impact on the thyroid gland and balance the hormones, raise energy levels, promote

better sleep, assist in weight reduction, enhance circulation, and activate metabolism.The *asanas* such as *Ustrasana, Balasana, Ardha chakrasana*, *Setubanasana,Sarvangasana,Viparetakarani*, *Halasana, Matsyasana*, *Bhujangasana,* and *Dhanurasana*are very effective in alleviating the symptoms of hypothyroidism [22]. When these *asanas*areperformed, theyhave a profound effect on the thyroid gland as they massage or soothe the thyroid gland, which, in turn, results in enhanced blood circulation to the thyroid gland. This is because the performance of these *asanas* involves backward bending, or raising the legs, which resultsin a massaging effect on the thyroid gland [29]. *Pranayama* helpsin overall respiration and oxygen saturation by increasing lung capacity. It also reduces anxiety and stress and increases focus and boosts energy levels.Hypothyroidism affects respiratory muscle. Therefore,the practice of*Pranayama*is greatly beneficialto the respiratory system. [23].Yoga *Nidra* helpsreduce depression and anxiety and improve well-being [15].The present study focused on hypothyroid women with depression and lowesteem.There was a significant decrease in depression levels among the experimental group as compared tothecontrol group (table 1 and figure 1). Similarly, there was a significant improvement in self-esteem and well-being inthe experimental group as compared to the controlgroup (table 2 and figure 2). This is consistent with earlier studies that yoga practice improves physical health,reducesanxiety, controls stress, and benefits overallmental health in general (27-30).The study backs up the premise that yoga practice not only improves physical health but also promotes emotionalwell-being, both of which are important for women with hypothyroidism.

Conclusion

The present study reveals that yoga practice is beneficial to women suffering from hypothyroidism with depression and low self-esteem. Thereis a significant reductionindepression and improvement of self-esteem among women with hypothyroidism.The present study was carried out with a small sample size; a study with a large sample size will substantiate these findings.Although further study is needed to establish the long-term effects of yoga on thyroid function, the present study reveals the promising effect of yoga practice on hypothyroidism.

References

[1]. Chakera, A. J., Pearce, S. H., & Vaidya, B. (2011). Treatment for primary hypothyroidism: current approaches and future possibilities. *Drug design, development and therapy*, 1-11.

[2]. Brent, G. A. (2012). Mechanisms of thyroid hormone action. *The Journal of clinical investigation*, *122*(9), 3035-3043.

[3]. Persani, L. (2012). Clinical review: central hypothyroidism: pathogenic, diagnostic, and therapeutic challenges.*J Clin Endocrinol Metab,* 97, 3068-78.

[4]. Vanderpump, M. P. (2011). The epidemiology of thyroid disease. *British medical bulletin*, *99*(1).

[5]. Chaker, L., Bianco, A. C., Jonklaas, J., & Peeters, R. P. (2018). Hypothyroidism and hypertension: fact or myth?–Authors' reply. *The Lancet*, *391*(10115), 30.

[6]. Alam, M. A., Quamri, M.A., Sofi, G., &Ansari, S. (2020). Update of hypothyroidism and its management in Unani medicine. *J Basic Clin Physiol Pharmacol*, 32, 1-10.

[7]. Brito, J.P., Ross J.S., El Kawkgi, O.M., Maraka, S., Deng, Y., Shah, N.D., Lipska, K.J. (2021). Levothyroxine Use in the United States, 2008-2018. *JAMA Intern Med,* 181(10), 1402-1405.

[8]. McAninch, E. A., & Bianco, A. C. (2016). The history and future of treatment of hypothyroidism. *Annals of internal medicine*, *164*(1), 50-56.

[9]. Watt, T., Cramon, P., Hegedüs, L., Bjorner, J. B., Bonnema, S. J., Rasmussen, Å. K., ... & Groenvold, M. (2014). The thyroid-related quality of life measure ThyPRO has good responsiveness and ability to detect relevant treatment effects. *The Journal of Clinical Endocrinology & Metabolism*, *99*(10), 3708-3717.

[10]. Jonklaas, J., Bianco, A. C., Bauer, A. J., Burman, K. D., Cappola, A. R., Celi, F. S., ... & Sawka, A. M. (2014). Guidelines for the treatment of hypothyroidism: prepared by the american thyroid association task force on thyroid hormone replacement. *thyroid*, *24*(12), 1670-1751.

[11]. Ross, D. S., Burch, H. B., Cooper, D. S., Greenlee, M. C., Laurberg, P., Maia, A. L., ... & Walter, M. A. (2016). 2016 American Thyroid Association guidelines for diagnosis and management of hyperthyroidism and other causes of thyrotoxicosis. *Thyroid*, *26*(10), 1343-1421.

[12]. Winther, K. H., Cramon, P., Watt, T., Bjorner, J. B., Ekholm, O., Feldt-Rasmussen, U., ... & Bonnema, S. J. (2016). Disease-specific as well as generic quality of life is widely impacted in autoimmune hypothyroidism and improves during the first six months of levothyroxine therapy. *PloS one*, *11*(6), e0156925.
[13]. Sengupta, P. (2012). Health impacts of yoga and pranayama: A state-of-the-art review. *International journal of preventive medicine*, *3*(7), 444.
[14]. Boehm, K., Ostermann, T., Milazzo, S., & Büssing, A. (2012). Effects of yoga interventions on fatigue: a meta-analysis. *Evidence-Based Complementary and Alternative Medicine*, *2012*(1), 124703.
[15]. Devi, K. G. (2019). *"Immediate Effects of Yoga Nidra and Shavasana (Supine Rest) Among Insomnia Patients On Heart Rate Variability"-a Comparative Study* (Doctoral dissertation, Rajiv Gandhi University of Health Sciences (India)).
[16]. Field, T. (2016). Massage therapy research review. *Complementary therapies in clinical practice*, *24*, 19-31.
[17]. Innes, K. E., Selfe, T. K., Khalsa, D. S., & Kandati, S. (2016). Effects of meditation versus music listening on perceived stress, mood, sleep, and quality of life in adults with early memory loss: A pilot randomized controlled trial. *Journal of Alzheimer's Disease*, *52*(4), 1277-1298.
[18] Sridip Chatterjee, S. C., & Mondal Samiran, M. S. (2017). Effect of combined yoga programme on blood levels of thyroid hormones: a quasi-experimental study S9-S16.
[19]. Baishya, A., & Metri, K. (2024). Effects of yoga on hypothyroidism: A systematic review. *Journal of Ayurveda and Integrative Medicine*, *15*(2), 100891.
[20]. Mohan, S., & Pal, R. (2022). Effect of yogic practices on thyroid hormones: A review. *BLDE University Journal of Health Sciences*, *7*(1), 7-13.
[21]. Bhandari, R. B., & Mahto, P. K. (2024). Effect of Yoga Therapy on Hypothyroidism: A Systematic Review. *Annals of Neurosciences*, 09727531241282516.
[22]. Rani, S., Maharana, S., Metri, K. G., Bhargav, H., & Nagaratna, R. (2021). Effect of yoga on depression in hypothyroidism: A pilot study. *Journal of Traditional and Complementary Medicine*, *11*(4), 375-380.
[23]. Swami, G., Singh, S., Singh, K. P., & Gupta, M. (2010). Effect of yoga on pulmonary function tests of hypothyroid patients. *Indian J Physiol Pharmacol*, *54*(1), 51-6.
[24]. Salehi, A. (2019). The effect of eight weeks yoga program on the thyroid function in middle-aged women. *Journal of Physical Activity and Hormones*, *2*(4), 63-74.
[25]. Singh, P., Singh, B., Dave, R., & Udainiya, R. (2011). The impact of yoga upon female patients suffering from hypothyroidism. *Complementary therapies in clinical practice*, *17*(3), 132-134.
[26]. Radhika, A. (2024). Efficacy of yoga practices on body mass index, systolic blood pressure and stress among middle aged women suffering with hypothyroidism. *MSW Management Journal,* (1), 367-376.
[27]. Yamamoto-Morimoto K., Horibe, S., Takao, R., Anami, K. (2019). Positive effects of yoga
on physical and respiratory functions in healthy inactivemiddle-aged people. *Int J Yoga*, 12,62-7.
[28]. Akhtar, J. (2019). Role of yoga in improving quality of life of hypothyroidism patients.*Int J Adv Med,* 6(2), 341-345.
[29]. Bhandari, R.B., &Mahto, P.K. (2024). Effect of Yoga Therapy on Hypothyroidism: A Systematic Review, *Annals of Neurosciences*.
[30]. Sharma, T., Goyal, B., Ahmed, K. A. M., Deo, G., Kaushik, I., Malik, R., ... & Chandra, K. (2024). Efficacy of Standardized Yoga Asanas as Add-on Therapy in the Management of Hypothyroidism: A Randomized, Open-label, Controlled Clinical Study. *International Journal of Yoga*, *17*(2), 124-131.