



Impact of Mind-Body Intervention on Waist Circumference and Low-Density Lipoprotein on Females with Hypothyroidism

Pallavi Latari Helwade^{1*}, Dr V. Subbulakshmi², Dr Meena Ramanathan³

¹Ph.D. Scholar (Full Time), Faculty of Yoga Science and Therapy, Meenakshi Academy of Higher Education and Research, Chennai-600078. Tamil Nādu, India Email Id: pallavihelwade@gmail.com

²Principal, Faculty of Yoga Science and Therapy, Meenakshi Academy of Higher Education and Research, Chennai-600078. Tamil Nādu, India

³Deputy Director, School of Yoga Therapy. ISCM. Sri Balaji Vidyapeeth, Puducherry.

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ABSTRACT

Background: Underactive thyroid discrepancy in females with hypothyroidism causes increase in cholesterol levels, weight, blood pressure, cardiovascular complications, imbalanced heart rate and depression. The prevalence of hypothyroidism in India is 11%, compared with only 2% in the UK and 4-6% in the USA (Bagcchi S., 2014). The highest prevalence of hypothyroidism (13.1%) is noted in middle aged women between 35 and 60 years of age (Unnikrishnan A et.al, 2011). Mind – Body Intervention is proven to be effective approach in reducing weight, dyslipidaemia, depression, cardiovascular and respiratory issues and balancing the autonomic nervous system. This Human Ethical Committee approved study used the yoga and ayurvedic diet as a mind body intervention, to treat hypothyroidism in females.

Aim & Objective: To evaluate the impact of Mind- Body Intervention on Waist Circumference (WC) and Low -Density Lipoprotein (LDL) on females with Hypothyroidism.

Methods: 20 females diagnosed with hypothyroidism were recruited for the investigation and randomly divided into group I (Mind- Body Intervention) and group II (control group- no training) for 12-weeks intervention period. Baseline reports were collected before and after the intervention for both groups on Waist Circumference and Low -Density Lipoprotein

Statistical tool: Paired T- test was performed to find the differences within and between the groups respectively. Test of significance was fixed at 0.001 level of confidence.

Results: It was proven that there is a significant decrease in WC (80.06 ± 3.307 , $P < 0.045$) & LDL (106.40 ± 6.670 , $P < 0.101$) in group I as compared to the group II where there was no significant difference in WC (87.30 ± 3.945 , $P < 0.000$) & LDL (147 ± 6.182 , $P < 0,001$) after twelve weeks of intervention using paired t-test. Group I show a significant improvement on group comparison WC (7.400 ± 2.836 , $P < 0.000$) & LDL (47.300 ± 6.019 , $P < 0.000$).

Conclusion: It is concluded Mind – Body Intervention helps in decreasing WC & LDL in females with hypothyroidism. Hence, mind – body approach can be a cost-effective treatment in improving physical health in hypothyroidism.

Keywords: Mind-Body Intervention, Hypothyroidism, Waist Circumference, Low-Density Lipoprotein, Females

INTRODUCTION:

Hypothyroidism, characterized by an underactive thyroid gland, leads to inadequate production of thyroid hormones, impacting fundamental somatic processes such as cellular metabolism (Davies L et. al (2014)). If neglected, it can afflict various health issues, including elevated cholesterol levels, developing the risk of heart disease. Often slower metabolism results in weight gain (P.M. Siu et.al (2015)). Moreover, this ailment can also

contribute to play a role in lowering heart rate and raising blood pressure and can be a potential cause for cardiovascular complications (L.H. Duntas et al (2012)).

“Hypothyroidism's consequences encompass fertility, mental well-being, and immunity, rendering individuals more vulnerable to infections. The intricate control of thyroid hormones extends to the hypothalamic-pituitary-thyroid axis, a component of the neuroendocrine system assigned with equilibrium of hormone. Stress influences this axis, impacting metabolism, protein synthesis, and growth, including bone and neural development. It also moulds sensitivity to hormone such as adrenaline (Bagcchi S., (2014)).”

The determinants of hypothyroidism include Hashimoto's disease, which is an autoimmune condition affecting the thyroid, thyroiditis or inflammation of the thyroid, congenital hypothyroidism present at birth, surgical removal of part or all of the thyroid, radiation treatment of the thyroid, certain medications, and insufficient iodine in the diet.

“The mechanics of Mind- Body approach in terms of Yoga and Ayurvedic Diet helps the subjects to improve nitric oxide build up in the muscles, improved mitochondrial function of the cells and reduce the fatigue in women with underactive thyroid. With lower levels of adrenal fatigue, catecholamines levels get lowered which helps in lowering cortisol hormone, a precursor to stress in women. The lower levels of cortisol have direct correlation with the lower levels of blood sugar levels which significantly lowers the waist circumference and Low- Density Lipoprotein. Ayurvedic diet has rich sources of iodine, magnesium, selenium, zinc and other micronutrients which helps to lower the blood glucose levels by lowering low-density lipoprotein and improves the flexibility of endothelium cells in the blood vessels (Streeter CC et al (2007)).”

INCLUSION AND EXCLUSION CRITERION:

Investigatory approach for this research was done on females aged 35- 60 years with hypothyroidism, having T3 Level and T4 levels of 2.0-4.0 ng/ml and 0.8-1.8 ng/dl respectively and willing to accept the intervention with informed consent. Females with thyroid surgery, co-morbidities, cancer and pregnancy were neglected for this study.

METHODOLOGY:

This study is ethically approved by Institutional Human Ethics Committee with having reference number, MMCH & RI IEC/PhD/30/JUNE/22.

For the random group experimental study, 20 females with hypothyroidism were selected randomly by using random sampling group design aged from 35 to 60 years and they were divided into two groups I and II with ten subjects each. It was hypothesized that there would be significant differences due to Mind – Body Intervention such as Yoga & Ayurvedic Diet on Waist Circumference and Low-density lipoprotein among females diagnosed with underactive thyroid than the control group. Initial test was conducted for the two Groups (I and II) on the selected dependent variables before the start of the training program. Group I was given Yoga & Ayurvedic Diet as a Mind – Body Intervention; Group II (Control Group) didn't receive any specific treatment but were in active rest. After the experimental period of twelve weeks, the two Groups (I and II) were finally retested on the same selected dependent variables. Paired t-test was used to find out the significant differences between experimental group I and the control group II.

Mind – Body Intervention

Yoga for Hypothyroidism:

The following yogic practices were advised for women diagnosed with hypothyroidism. These practices are curated to address the specific needs of individuals dealing with hypothyroidism, considering their physical and physiological well-being. Yoga tradition offers a holistic and tailored approach to enhance the overall health and quality of life for women facing underactive thyroid clinical condition.

Table I: Yoga for Females with Hypothyroidism

Warm Up	Sukshma Vyayayama
Asana	Tadasanam, Veerbhadransanam, Parsva Uttanasanam, Prasarita Pada uttanasanam, Trikonasanam (Parsva Bheda & Parivritti Bheda), Parsva Konasanam, Pasarita Pada uttanasanasanam, Suryanamskar, Sethu Bandhasana, Sarvangasana, Halasana, Janu sirsasana, Paschimottanasana, Mahamudra, Matsyasana, Shavasana
Pranayama	Yogic Breathing, Ujjayi Breathing, Nadi Shodhana, Bhramari Pranayama
Dhyana & Chanting	Chakra Meditation with Chanting

Table II: Ayurvedic Diet for Hypothyroidism

Sr No	Food	Foods Recommended for Hypothyroidism
1.	Detox Tea	Made with cumin seeds, coriander seeds, fennel seeds and half a teaspoon of dry ginger powder and turmeric powder.
2.	Nuts & Seeds	Pumpkin seeds, sunflower seeds, Brazil nut, Cashew nuts, Almonds, Walnuts
3.	Fruits	Banana, Papaya, Apple, Pomegranate, Pineapple, Sweet lime

4.	Vegetables	Beans, ash Gourd, snake Gourd. Ridge gourd, Bottle guard, Bitter guard, Ivy Guard, Beetroot, Greens, Carrots, Onion, Garlic, Green Chillies
5.	Grains	Rice, Sorghum (Jawar), Pearl millet (Bajara), Barley
6.	Legumes & Pulses	Mung Dal, Cowpeas, Horse Gram (Kulith), Black Gram, Chana
7.	Oils & Fats	Sesame oil, Sunflower Oil, Rice Bran Oil, Ghee
8.	Spices	Methi (Fenugreek), Anise seeds, Black Pepper, Cinnamon, clove, Cardamom, cumin, Coriander powder, sunthi, Turmeric, saffron,

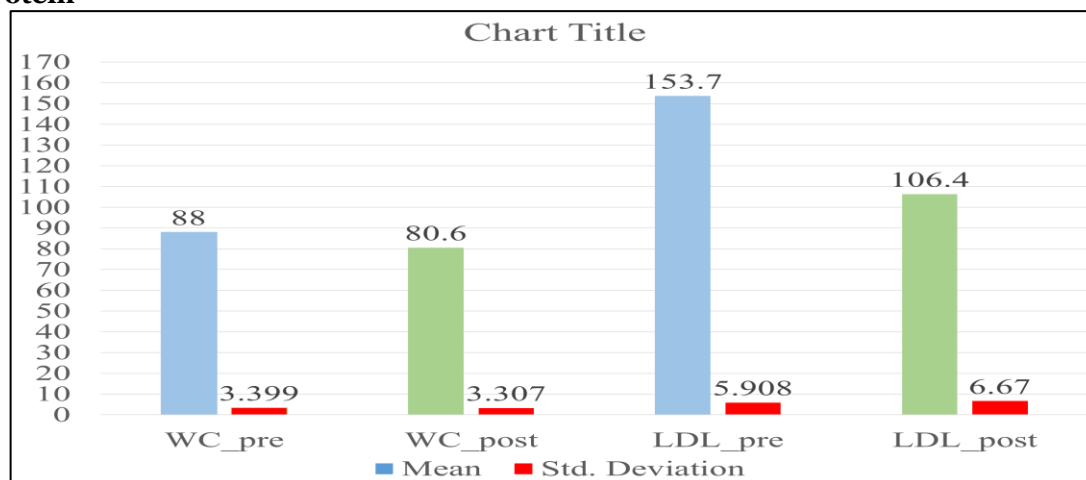
RESULTS:

The data pertaining to the variable collected from the two groups before and after the training period were statistically analyzed by using Paired t-test to determine the significant difference and the hypothesis was tested at 0.001 level of confidence. It was proven that there is a significant decrease in WC (80.60 ± 3.307 , $P < 0.001$) & LDL (106.40 ± 6.670 , $P < 0.000$) in group I as compared to the group II where there was no significant difference in WC (87.30 ± 3.945 , $P < 0.697$) & LDL (147 ± 6.182 , $P < 0.000$) after twelve weeks of intervention using paired t-test. They are shown in the Table III (Group Statistics) and Fig I.

Table- III
Paired T- Test for Waist Circumference and Low-Density Lipoprotein

Group Statistics							
Variables	Groups	N	Mean	Std. Deviation	T	df	p-value
WC_Pre	Exp I (Mind- Body Intervention)	10	88.00	3.399	.396	18	0.697
	Control II	10	87.40	3.373	-.396	17.999	0.697
WC_Post	Exp I (Mind- Body Intervention)	10	80.60	3.307	-4.116	18	0.001
	Control II	10	87.30	3.945	-4.116	17.466	0.001
LDL_Pre	Exp I (Mind- Body Intervention)	10	153.70	5.908	2.277	18	0.035
	Control II	10	148.30	4.620	2.277	17.012	0.036
LDL_Post	Exp I (Mind- Body Intervention)	10	106.40	6.670	-14.117	18	0.000
	Control II	10	147.00	6.182	-14.117	17.897	0.000

Fig- I: Bar Diagram for Pre and Post Test of Waist Circumference and Low-Density Lipoprotein



The table IV shows the computation of analysis of variance between the experimental group I (Mind- Body Intervention) for Waist Circumference and low-density Lipoprotein. Experimental Group I show a significant improvement on group comparison WC (7.400 ± 2.836 , $P < 0.000$) & LDL (47.300 ± 6.019 , $P < 0.000$). The

obtained “p” value for Initial and final test mean was 0.00 which is lesser than 0.001 level of significance. Hence, there were statistically significant difference noticed between the experimental group I on Waist Circumference and low- density Lipoprotein on females with hypothyroidism.

Table- IV: Paired Sample Test for Experimental Group I

Paired Samples Test of Experimental Group I						
Experimental Group I (Mind- Body Intervention)		Paired Differences		T	df	p-value*
		Mean	Std. Deviation			
Pair 1	WC_pre - WC_post	7.400	2.836	8.251	9	.000
Pair 2	LDL_pre - LDL_post	47.300	6.019	24.849	9	.000

*P-value<0.001 level of significance.

The table V shows the computation of analysis of variance between the experimental group I (Mind- Body Intervention) for Waist Circumference and low-density Lipoprotein. Experimental Group I show a significant improvement on group comparison WC (0.100 ± 1.197 , $P < 0.798$) & LDL (1.300 ± 3.020 , $P < 0.207$). The obtained “p” value for pretest and posttest mean was 0.00 which is greater than 0.001 level of significance. Hence, there were no statistically significant difference noticed between the Control group II on Waist Circumference and low-density Lipoprotein on females with hypothyroidism.

Table V: Paired Samples Test for Control Group II

Paired Samples Test for Control Group II						
Control Group II		Paired Differences		t	df	p-value
		Mean	Std. Deviation			
Pair 1	WC_Pre – WC_Post	.100	1.197	.264	9	.798
Pair 2	LDL_Pre – LDL_Post	1.300	3.020	1.361	9	.207

*P-value<0.001 level of significance.

DISCUSSION:

The present research was designed to find out the impact of Mind- Body Intervention on waist circumference & low-density lipoprotein on females with hypothyroidism. The outcome of the present research shows the significant improvement on waist circumference & low-density lipoprotein of experimental group I than the subjects of the control group II.

A study done by Shetty et al. (2020), shows the significant improvement in waist circumference & low-density lipoprotein among the obese hypothyroid patients due to Mind- Body Intervention such as Yoga and Ayurvedic Diet. Another study done by Nilakanthan S et.al (2016), also shows the significant improvement in waist circumference & low-density lipoprotein by a scientific way of intense Yoga module on hypothyroidism. Overall, this investigation has shown torch bearing effect on other variables of hypothyroidism to proceed with Physical and physiological wellbeing of mankind.

CONCLUSION:

Hence it is concluded that Mind- Body Intervention helps in decreasing waist circumference & low-density lipoprotein in females with hypothyroidism. This integrated modality of Yoga & ayurvedic diet as Mind- Body approach seems to be cost-effective treatment in improving health in hypothyroidism as well as metabolic syndrome.

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