

A Comparative Study of Mudras in Yoga and Dance on Lipid Profile Among Women Population of Calicut District

Sapna K¹, Dr. S Natarajan², Dr. CV Jayanthi³

¹Research Scholar, Department of Yoga, School of Ancient Indian Studies, Vels Institute of Science, Technology and Advanced Studies, Chennai, Tamil Nadu, India

²Associate Professor, Department of Yoga, School of Ancient Indian Studies, Vels Institute of Science, Technology and Advanced Studies, Chennai, Tamil Nadu, India

³Assistant Professor, Department of Yoga, School of Ancient Indian Studies, Vels Institute of Science, Technology and Advanced Studies, Chennai, Tamil Nadu, India

Abstract: *The study aims to prove the impact, that yoga and dance mudras has on Biochemical markers specifically Lipid Profile, among middle aged women in Calicut District. Mudras are generally defined as certain gestures that vit for an intention or an idea and which are said to influence body as well as the mind significantly. In the course of literature review, it was found that different modalities of yoga do affect in a positive way among positive changes in the lipid profile and other metabolic parameters. Mudras are hand gestures that control the flow of specific energy within the body. The state of mind and consciousness can be influenced by creating a specific pose. Mudras are used in yoga and dance. It serves as a means of external communication in the dance and is a means of internal communication in yoga. They influence brain and mind processes and regulate the functioning of the nervous system by connecting various nerve endings in the sympathetic and parasympathetic systems. . . . Yoga hand poses are very effective in managing medical conditions like heart attack, high blood pressure, diabetes, etc. Practicing yoga helps in lowering the glucose levels. blood urea level and blood cholesterol concentration Regular practice stimulates the body's anabolic processes. and reduce catabolic activity. However, as for the performance of the dance mudras in the expected regard, the scientific possibilities have not been explored thereto. The study involved 30 middle - aged women who were divided into two groups: to mention but the yoga mudra group and the dance mudra group. They also undertook lipid profile test analysis at the onset and at the termination of the study following their 12 week mudra training. To allow for the check against variation for the scores obtained onpost - test, it was conducted a comparison between the scores obtained in the pre - and post - test with the use of ANOVA. Subsequently, the aim of this randomized control trial is to evaluate the impact of various Mudras practiced in Yoga and dance on the lipid profile parameters of adult women in Calicut District. Therefore, it is seen that Mudras practice might have a positive correlation in making modification of lipid profiles, thereby pointing towards its systematic practice in handling of cardiovascular diseases. The outcome of this process may also be useful in order to provide insight into utilising mudra as a complementary therapy in lipid profile's and overall well - being normalisation.*

Keywords: Yoga, Dance, Mudras, Total cholesterol, HDL, LDL

1. Introduction

The issue of high cholesterol is a major global health concern. The World Health Organization (2021) reports that around 39% of adults aged 25 and older across the globe have elevated levels of total cholesterol. Cholesterol is a waxy substance that resembles fat and is present in every cell of the body. It is crucial for various bodily functions, including the production of hormones, vitamin D, and compounds that aid in digestion. In the bloodstream, cholesterol moves in small carriers known as lipoproteins, which consist of fat on the inside and protein on the outside. If high cholesterol isn't treated, it can lead to serious health issues. Excess cholesterol can build up in the arteries, narrowing or blocking them, a condition called atherosclerosis. This restricts blood flow and raises the risk of cardiovascular diseases. Some of the key complications include: Heart Disease, Stroke, Peripheral Artery Disease (PAD), High Blood Pressure, Kidney Damage. Managing cholesterol through healthy habits, medication, and regular check - ups can help reduce these risks and support better long - term health.

In today's world, where many struggle with stress and the demands of daily life, mudras offer a simple yet powerful way to restore balance and well - being. Regular practice can help manage both physical and mental health, contributing to overall wellness without the need for extensive medical intervention. Yoga, a practice believed to be over 5, 000 years old, is one of the six core systems of Indian philosophy. Its name comes from the Sanskrit word "Yuj," which means "to join" or "unite." Yoga's origins are often linked to the Rig Veda, one of the oldest sacred texts, and it was further developed by Vedic sages and philosophers over time. Some historians suggest that the roots of yoga may go as far back as the Harappan civilization or the Saraswati culture of ancient northern India. Initially, the teachings of the Vedas were reserved for Brahmins and spiritual leaders, but over centuries, yoga evolved beyond physical practices, becoming a holistic discipline that encompasses both body and mind.

In Vedic philosophy, the universe is understood to be made up of five essential elements: fire, air, ether, earth, and water. These elements are symbolically represented by the five fingers of the hand. Fire corresponds to the thumb, air to the index finger, ether to the middle finger, earth to the ring

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finger, and water to the little finger. Hand gestures, or mudras, are thought to help maintain balance among these elements in the body. Any disruption in this balance is believed to contribute to various physical and mental health problems.

Mudras play a significant role in both yoga and traditional Indian dance, like Bharatanatyam, where they help regulate the flow of vital energy, or "prana," through the body. In yoga, mudras direct energy from the root chakra to the crown chakra, promoting a sense of balance and well-being. Similarly, in dance, these hand gestures convey deep emotions and help tell stories through movement. These practices are deeply rooted in ancient texts such as the Hatha Yoga Pradipika, Natyashastra, and Abhinaya Darpana.

As modern life becomes more fast-paced and stressful, people often face anxiety, depression, and chronic illnesses like heart disease, high cholesterol, and diabetes. While medications help manage these conditions, they often come with long-term side effects. Mudras offer a natural alternative, helping balance internal energy and potentially reducing the need for medications.

Scientific studies

Scientific studies suggest that mudras can influence both the mind and body. These hand gestures are thought to affect the brain's neural pathways, influencing emotions and triggering biochemical changes. Yoga mudras, in particular, have been shown to help lower blood pressure, reduce heart rate, and improve conditions like diabetes and heart disease. By stimulating nerves in the fingers and palms, mudras activate the body's parasympathetic nervous system, which promotes relaxation and helps the body recover from stress. Hand mudras can influence the autonomic nervous system and engage specific regions of the central nervous system. These mudras are closely tied to our emotional states. Emotions aren't just chemical reactions in the brain; rather, they consist of electrochemical signals that transmit emotional information throughout the body. These signals, made up of various peptides, can have significant effects on our overall well-being (Pert, 1997).

The human body's physiology is regulated by the nervous system in conjunction with the hormonal system (Pallav Sengupta, 2012). Research on the neuroanatomy of the hand, particularly the palm, indicates that yoga hand mudras exert their effects through the nerve endings located in the fingers and palm (Pallav Sengupta, 2012). Additionally, studies have shown that practicing yoga can help lower blood sugar levels (Mookerjee, 1974; Udappa et al., 1971) as well as serum cholesterol (Udappa et al., 1971; Udappa et al., 1975; Joseph et al., 1981; Kothari et al., 1973; Rao et al., 1980; Sri Krishnan and Jain, 1980).

2. Methodology

A randomised trial was conducted on a sample of 30 women aged 30 - 40 years from the Calicut District. The participants were randomly assigned to two groups: Yoga Mudras and dance Mudras, over a period of 12 weeks. Pre and post-intervention blood samples were collected to assess cholesterol, HDL and LDL levels.

- Sample size:** 30 Middle Aged Women
- Study Design:** Simple Random Sampling Technique
- Study Duration:** 12 weeks
- Study Instrument:** Lipid profile – Cholesterol, HDL, LDL
- Interventional Model:** Mudra practices were given daily for both Yoga group and Dance group.

Yoga Mudras

Apan Vayu Mudra



Bhramara Mudra



Chinmudra



Hamsasya Mudra



Study Procedures:

- Women population aged between 30 to 40 were selected from the centre for yoga and dance in the district of Calicut, Kerala State.
- Pedigree details were collected from the selected adult females
- Medical history, if any, will be recorded for each individual.
- Subject selection was based on the Pre test having the abnormalities in the lipid profile level.
- Training for using Mudras (Yoga & Dance) were given to the selected individuals after their regular practices of yoga and dance.
- Subjects will be taken to a common centre (centre for yoga and dance) and the biochemical parameter (Lipid profile) was studied
- Recorded data was analysed statistically.

Training

Selected females were provided with training in Yoga and dance, on how to perform different MUDRAS. Selected females were taken to a common point (the Dance & Yoga

Centre) where the training was given daily, with proper monitoring. Each day, the training was carried out for one hour. The session started with a prayer and was continued by the specified Mudras. Yoga group were asked to sit in any comfortable sitting posture and dancers with the subtle dance movements. **Chinmudra** was the first mudra trained to the females selected for yoga session and **Hamsasya** for dance session. This was continued for the first 25 minutes. After 5 minutes break, **Apan vayu Mudra** was taught for Yoga session and for Dance group it was **Bhramara Mudra**. This was continued for the next 25 minutes too. Each session ended with the closing prayer. The same system was followed for 12 weeks.

The Gyan Mudra, is associated with the "Hamsasya" in Abhinayadarpana and the "Omkar Mudra" in Nruttasutra. These mudras share similarities in their effects and function. To perform the Gyan Mudra, touch the tip of your thumb to the tip of your index finger, while keeping the other three fingers extended.

3. Statistical Analysis

Table 4.1: Analysis of Co- Variance of the Pre Test and Post Test Means of the Bharathanatym and Yoga group in Total Cholestrol (<200 mg/dl)

Group	Bharathanatym	Yoga	Source of variance	Sum of squares	df	Mean square	'F' Ratio
Pre Test Mean	243.06	216.86	Between	20.833	1	20.833	0.170 NS
SD	17.46	10.37	Within	8192.533	28	292.590	
Post test Mean	241.40	214.73	Between	34.133	1	34.133	0.317 NS
SD	16.73	10.37	Within	3014.667	28	107.667	
Adjusted Post test mean	242.23	215.80	Between	27.418	1	27.418	0.243 NS
			Within	2843.175	28	98.563	

Analysis of Co - Variance of the Pre Test and Post Test Means of the Bharathanatym and Yoga group in Total Cholestrol (<200 mg/dl) NS – Not Significant

From the table 4.1 results proved that the pre test mean score on Bharathanatym group is 243.06, yoga group is 216.86. Therefore, it is inferred that the obtained calculated 'F' value is 0.170 for Pre - Test mean score. Therefore, the framed research hypothesis is rejected. It is inferred that there is no significant difference between the pre - test means of the Total Cholestrol (<200 mg/dl). Wherever, the Post test mean score on Bharathanatym group is 241.40 and yoga group is 214.73. Therefore, it is evident that the obtained 'F' value 0.317 for Post- Test mean score. Therefore, the framed research hypothesis is rejected. Further, the above table taking into consideration of the adjusted post test mean score on Bharathanatym group is 242.23, yoga group is 215.80. Therefore, it is evident that the calculated 'F' value is 0.243. Therefore, the framed research hypothesis is rejected. It is inferred that there is no significant difference between the

adjusted post - test means of the Total Cholestrol (<200 mg/dl).

Since the significant improvement is recorded, the result is further subjected to Post- Hoc analysis using the Scheffe's Confidence interval test. The results are presented in Table.4.1.1.

Table 4.1.1: Scheffe's Post - HOC Test for Total Cholestrol (<200 mg/dl)

Total Cholestrol		Mean Difference	C. I Value	Result at 0.05 level
Bharathnatym	Yoga			
242.23	215.80	26.4	1.72	NS

The multiple mean comparisons shown in table 4.1.1. It is evident that there is no significant difference between the adjusted mean of Bharathnatyam and yoga group based on Total Cholestrol (<200 mg/dl).

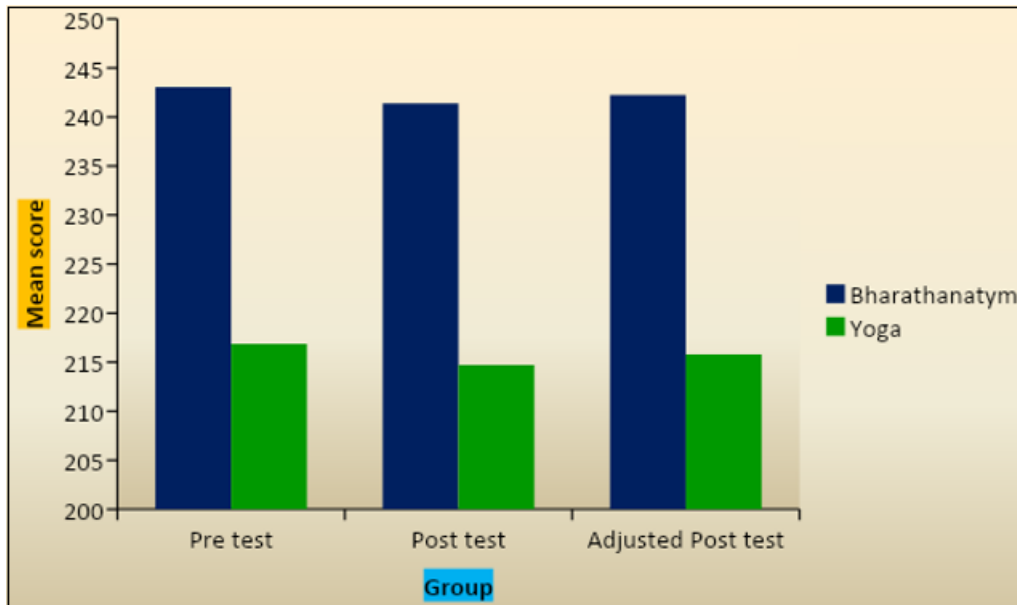


Figure 4.1: Analysis of Co - Variance of the Pre Test and Post Test Means of the Bharathanatyam and Yoga group in Total Cholesterol (<200 mg/dl)

Table 4.2: Analysis of Co - Variance of the Pre Test and Post Test Means of the Bharathanatyam and Yoga group in HDL

Group	Bharathanatyam	Yoga	Source of variance	Sum of squares	df	Mean square	'F' Ratio
Pre Test Mean	72.86	72.46	Between	23.941	1	23.941	0.196 NS
SD	11.48	8.01	Within	3415.471	28	121.981	
Post test Mean	74.65	78.56	Between	279.075	1	279.075	8.91 S
SD	10.58	11.2	Within	2685.167	28	95.899	
Adjusted Post test mean	73.76	75.51	Between	253.147	1	253.147	6.17 S
			Within	2265.361	28	84.726	

S – Significant

NS – Not Significant

From the above table results shows that the pre test mean score on Bharathanatyam group is 72.86 and yoga group is 72.46. Therefore, it is inferred that the obtained calculated 'F' value is 0.196 for Pre - Test mean score. Therefore, the framed research hypothesis is rejected. It is inferred that there is no significant difference between the pre - test means of the HDL. Also, the Post test mean score on Bharathanatyam group is 74.65 and yoga group is 78.56. Therefore, it is evident that the obtained 'F' value 8.91 for Post- Test mean score. Therefore, the framed research hypothesis is accepted. Further, the above table taking into consideration of the adjusted post test mean score on Bharathanatyam group is 73.76, yoga group is 75.51. Therefore, it is evident that the calculated 'F' value is 6.17. Therefore, the framed research hypothesis is accepted. It is

inferred that there is a significant difference between the adjusted post - test means of the HDL.

Since the significant improvement is recorded, the result is further subjected to Post- Hoc analysis using the Scheffe's Confidence interval test. The results are presented in **Table.4.2.1.**

Table 4.2.1: Scheffe's Post- HOC test for HDL

HDL		Mean Difference	C. I Value	Result at 0.05 level
Bharathnatym	Yoga			
73.76	75.51	1.75	0.74	S

The multiple mean comparisons shown in table 4.2.1. It is evident that there is a significant difference between the adjusted mean of Bharathnatym and yoga group based on HDL.

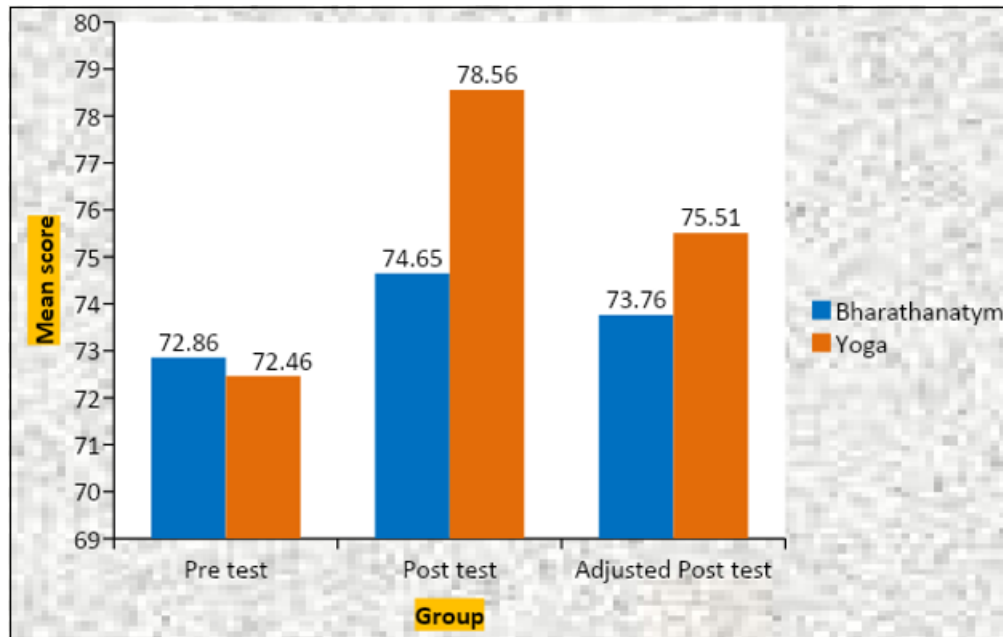


Figure 4.2: Analysis of Co - Variance of the Pre Test and Post Test Means of the Bharathanatyam and Yoga group in HDL

Table 4.3: Analysis of Co - Variance of the Pre Test and Post Test Means of the Bharathanatyam and Yoga group in LDL

Group	Bharathanatyam	Yoga	Source of variance	Sum of squares	df	Mean square	'F' Ratio
Pre Test Mean	132.52	144.40	Between	49.665	1	49.665	0.298 NS
SD	13.64	11.11	Within	4670.041	28	166.787	
Post test Mean	129.94	136.16	Between	508.408	1	508.408	7.441 S
SD	12.14	13.11	Within	4136.433	28	147.730	
Adjusted Post test mean	131.23	140.28	Between	416.078	1	416.078	4.064 S
			Within	3856.156	28	128.549	

S – Significant

NS – Not Significant

From the above table results proved that the pre test mean score on Bharathanatyam group is 132.52 and yoga group is 144.40. Therefore, it is inferred that the obtained calculated 'F' value is 0.298 for Pre - Test mean score. Therefore, the framed research hypothesis is rejected. It is inferred that there is no significant difference between the pre - test means of the LDL. Also, the Post test mean score on Bharathanatyam group is 129.94 and yoga group is 136.16. Therefore, it is evident that the obtained 'F' value 7.441 for Post - Test mean score. Therefore, the framed research hypothesis is accepted. Further, the above table taking into consideration of the adjusted post test mean score on Bharathanatyam group is 131.23, yoga group is 140.28. Therefore, it is evident that the calculated 'F' value is 4.064. Therefore the framed research hypothesis is accepted. It is

inferred that there is a significant difference between the adjusted post - test means of the LDL.

Since the significant improvement is recorded, the result is further subjected to Post- Hoc analysis using the Scheffe's Confidence interval test. The results are presented in Table.4.3.1.

Table 4.3.1: Scheffe's POST - HOC Test for LDL

LDL		Mean Difference	C. I Value	Result at 0.05 level
Bharathanatyam	Yoga			
131.23	140.28	9.05	2.42	S

The multiple mean comparisons shown in table 4.3.1. It is evident that there is a significant difference between the adjusted mean of Bharathanatyam and yoga group based on LDL.

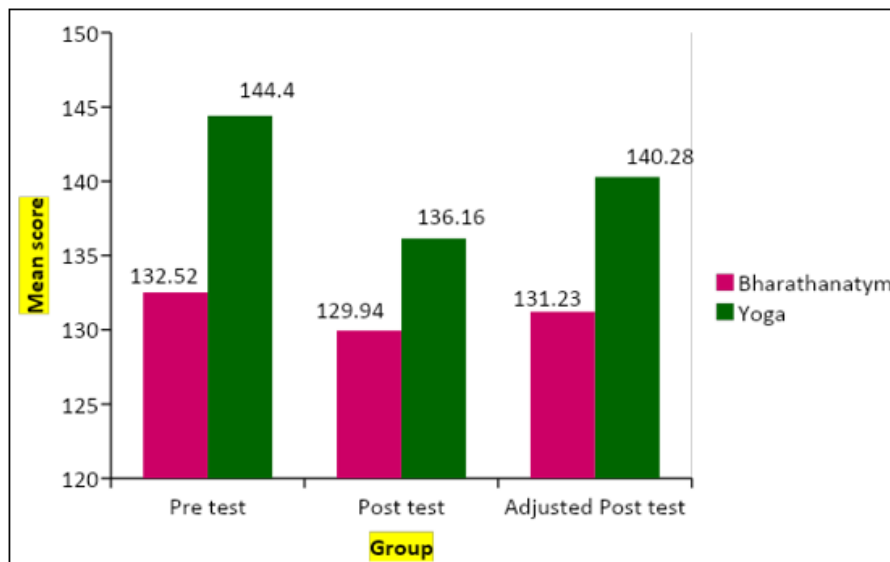


Figure 4.3: Analysis Of Co - Variance Of The Pre Test And Post Test Means Of The Bharathanatym and Yoga group in LDL

4. Results

The groups practicing Yoga and dance Mudras showed a significant reduction in LDL, and an increase in HDL levels. The changes were more pronounced in the Yoga Mudras group. No significant alterations were observed in total cholesterol.

5. Discussions

The reduction in LDL and the increase in HDL levels among Mudra practitioners align with previous studies indicating the beneficial effects of Yoga and dance on cardiovascular health. Human physiology is controlled and supervised by the nervous system in assistance with the hormonal system (Pallav Sengupta, 2012). Proper coordination of the organ - to - organ system with the neuro - hormonal axis is a prerequisite for homeostasis in the body. This ends up in the role of other physical activities like yoga to pull the physiology towards the required equilibrium for a healthy life by impacting both the organ system on interest also as the complex network of systems and the neuro - hormonal system (Pallav Sengupta, 2012).

Research suggests that performing mudras triggers the release of happy endorphins, providing a sense of well - being and relaxation (Mohini, A, 2015). Mudras are intricately linked to emotions, and emotions are not merely chemical reactions in the brain. Rather, they involve neurotransmitters that generate electrochemical signals, transmitting emotional messages throughout the entire body. These signals comprise a combination of peptides that have profound and extensive effects (Pert, 1997).

Tripathi D. *et al.* (2017) conducted a study to investigate the impact of yoga hand mudras on cardiac and neurological parameters in the prevention of heart attacks. The study's findings led to the conclusion that yoga hand mudras could serve as an immediate and essential emergency tool for providing primary supportive medical care on - site for heart attacks, potentially aiding the patient until hospitalization.

The study expands the understanding of the relationship between Mudras and biochemical markers, highlighting the key role of Mudras in managing cardiovascular health.

6. Conclusion

The findings suggest that the practice of Mudras, particularly in Yoga, positively impacts lipid profiles in adult women. In accordance with yoga philosophy, different areas of the hand are believed to correspond to specific regions of the brain. By applying gentle pressure to these hand areas, one can activate the corresponding brain region, much like reflexology.

Mudras play a vital role in stimulating various areas within the body by synchronizing with our breath and enhancing the flow of pranic energy, leading to overall improvements in our physical well - being. The incorporation of Mudras into routine exercise regimens may play a significant role in managing cardiovascular health. Further research is warranted to deepen our understanding of the mechanisms underlying these effects.

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