

**EFFECTIVENESS OF YOGA UPON MENOPAUSAL SYMPTOMS  
IN MENOPAUSAL WOMEN AT SELECTED PRIMARY  
HEALTH CENTRES OF THIRUVALLUR DISTRICT, CHENNAI.**

**By**

**Prof. SHOBANA GANGADHARAN, M.Sc.N., P.G.D.Y.N.,**



**A Thesis Submitted to**

**THE TAMIL NADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI**

**for the award of the degree of**

**DOCTOR OF PHILOSOPHY IN NURSING**

**JANUARY 2017**

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**PRINCIPAL & Ph.D RESEARCH GUIDE**

**APOLLO COLLEGE OF NURSING**

**CHENNAI – 600 095**

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## **CERTIFICATE**

This is to certify that the thesis entitled **“EFFECTIVENESS OF YOGA UPON MENOPAUSAL SYMPTOMS IN MENOPAUSAL WOMEN AT SELECTED PRIMARY HEALTH CENTRES OF THIRUVALLUR DISTRICT, CHENNAI”** submitted by **Prof. SHOBANA GANGADHARAN** for the award of the degree of Doctor of Philosophy in Nursing, is a bonafide record of research done by her during the period of study, under my supervision and guidance and that it has not formed the basis for the award of any other Degree, Diploma, Associateship, Fellowship or other similar title. I also certify that this thesis is her original independent work. I recommend that this thesis should be placed before the examiners for their consideration for the award of Ph.D. Degree in Nursing.

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## **DECLARATION**

I hereby declare that this thesis entitled **“EFFECTIVENESS OF YOGA UPON MENOPAUSAL SYMPTOMS IN MENOPAUSAL WOMEN AT SELECTED PRIMARY HEALTH CENTRES OF THIRUVALLUR DISTRICT, CHENNAI”** is my own work carried out under the guideship of **Dr.LATHA VENKATESAN, M.Sc(N),M.Phil.,Ph.D.,M.B.A., Principal and Ph.D Research Guide, Apollo College of Nursing, Chennai** which is approved by the Research Committee, The Tamil Nadu Dr. M.G.R Medical University, Guindy, Chennai.

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**Prof. Shobana Gangadharan**  
**Research Scholar**

**Place :**

**Date :**

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**Signature of the Candidate**

**Place : Chennai**

**Shobana Gangadharan**



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R	Yoga Intervention Protocol
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T	Certificate for participating in Indian Menopause Society conducted CME/ activities
U	Certificates for participating / presenting in Research/ Yoga workshop / Conference
V	Thesis related Publications
W	Ph.D Synopsis Submission Application Form
X	Ph.D Thesis Submission Application Form
Y	Photos
Z	Master Coding Sheet

## ABBREVIATIONS

1. ACTIVE Abaloparatide Comparator Trial in Vertebral Endpoints
2. ANM Age at Natural Menopause
3. BMD Bone Mineral Density
4. BMI Body Mass Index
5. CRD Centre for Reviews and Dissemination
6. CAM Complementary & Alternative Medicine
7. CONSORT Consolidated Standards of Reporting Trials
8. DARE Database of Abstracts of Reviews of Effects
9. DBP Diastolic Blood Pressure
10. EBP Evidence Based Practice
11. FMP Final Menstrual Period
12. FSH Follicle Stimulating Hormone
13. HRT Hormone Replacement Therapy
14. HFNS Hot Flushes and Night Sweats
15. IMS Indian Menopause Society
16. IAYT Integrative Approach to Yoga Therapy
17. JHN EBP Johns Hopkins Nursing Evidence Based Practice
18. LH Luteinizing Hormone
19. MHT Menopausal Hormone Therapy
20. MRS Menopause Rating Scale
21. MENQOL Menopause Specific Quality of Life Questionnaire
22. MBL Menstrual Blood Loss
23. MOOSE Meta-analyses of Observational Studies in Epidemiology

24. NAMS North American Menopause Society
25. NTWC No Treatment – Wait Control condition
26. PICO Patient/ Participants / Population, Intervention , Comparison, Outcome
27. PI(E)COS Participants, Interventions (or Exposure), Comparison groups, Outcomes, Study designs
28. PFM training Pelvic Floor Muscle Training
29. PET Practice question, Evidence, Translation
30. PRISMA Preferred Reporting Items for Systematic review & Meta Analyses
31. PAN Presence Across Nation
32. PHC Primary Health Centre
33. PROSPERO Prospectively Registered Systematic Reviews
34. QUORUM Quality of Reporting of Meta-analyses
35. RCT Randomised Controlled Trial
36. SI Soy Isoflavones
37. STRAW Stages of Reproductive Ageing Workshop
38. STROBE STrengthening the Reporting of OBservational Studies in Epidemiology
39. SWAN Study of Women’s Health Across the Nation
40. SBP Systolic Blood Pressure
41. TGMT Tratak Guided Meditation Technique
42. VMS Vaso Motor Symptoms
43. VVA Vulvo Vaginal Atrophy
43. WHO QOL World Health Organisation Quality of Life
45. WC Waist Circumference

## **ABSTRACT**

An experimental study to assess the effectiveness of Yoga upon menopausal symptoms in menopausal women at selected primary health centres of Thiruvallur district, Chennai. The present study is conducted to make out the impact of Yoga on menopausal symptoms in the post menopausal stage of a woman.

### **Objectives of the Study**

1. To assess and compare the effect of Yoga on menopausal symptoms before and after administration of Yoga between Yoga and Non-Yoga groups of menopausal women.
2. To assess and compare the effect of Yoga on quality of life between Yoga and Non-Yoga groups of menopausal women.
3. To correlate menopausal symptoms with quality of life among Yoga and Non-Yoga groups of menopausal women.
4. To find out the association of pre and post test menopausal symptoms with the selected demographic variables in Yoga and Non-Yoga groups of menopausal women.
5. To find out the association of pre and post test menopausal symptoms with the selected clinical variables in Yoga and Non-Yoga groups of menopausal women.
6. To find out the association of pre and post test quality of life with the selected demographic variables in Yoga and Non-Yoga groups of menopausal women.
7. To find out the association of pre and post test quality of life with the selected clinical variables in Yoga and Non-Yoga groups of menopausal women.
8. To determine the level of satisfaction regarding Yoga among Yoga group of menopausal women.

## **Methods**

The conceptual framework of the present study was developed based on Pender's Revised Health Promotion Model (2011). This framework was selected as it provides a way of understanding and predicting how Yoga practice in a phased manner helps in managing menopausal symptoms. An extensive search of research and non-research literature helped synthesize evidence of studies. In addition, this study pursued an extensive systematic review by using Johns Hopkins Evidence Based Practice Model which formed the foundation towards developing instruments and Yoga intervention for menopausal women.

The study was conducted in selected Sub Centres coming under two Primary Health Centres of Thiruvallur District namely Thiruverkadu PHC and Naravarikuppam PHC. The research was carried out among 228 (108 in Yoga group and 120 in non Yoga group) menopausal women following cluster sampling technique.

The major study variables in the study were menopausal symptoms in menopausal women in terms of their menopause specific quality of life before and after the Yoga intervention. Yoga, a Complementary and Alternative Medicine is a mind body intervention.

The study used cluster sampling technique. Total sample size estimated was 240, out of which 120 samples were assigned to Yoga group and 120 samples to Non – Yoga group from selected sub centres of two selected Primary health centres. There were however 12 drop outs in the Yoga group. Pretest and post test assessments were done for the subjects in experimental and control groups which were compared before and after the Yoga intervention to test the effectiveness of the same.

The data collected were analyzed according to the objectives and hypothesis of the study. The analysis of data was done through an integrated system of computer program known as statistical package for social sciences (SPSS) 20.0 .The major findings of the study were as follows:

### **Major Findings**

Majority of the menopausal women in the Yoga group (85.2%), and Non-Yoga group(85.8%) were married and living with husband. The distribution of educational status shows that significant percentage of menopausal women in Yoga and non Yoga group were primary and high school educated (44.4%, 40.8%), majority were homemakers (77.8%, 77.5%), a significant percentage were moderate workers (51.9%, 55.9%), having family monthly income < 15,000 (47.2%, 40%), majority had mixed diet as their food habit (74.1% ,70.0%), majority were living in nuclear family (75.9%, 83.3%) and were Hindus (85.2%,74.2%) in Yoga and non-Yoga group of menopausal women respectively.

The mean age at natural menopause was  $46.9 \pm 4.0$  years and  $47.0 \pm 3.5$  years in Yoga and Non-Yoga group respectively. Similarly, the mean current age was  $52.9 \pm 6.3$  and  $52.8 \pm 6.2$  and duration of menopause was ( $6.1 \pm 5.2$  and  $5.9 \pm 5$ ) in Yoga and non-Yoga groups of menopausal women.

Majority of them had irregular as the nature of menstrual cycle before menopause (74.1%, 77.5%), all of them had normal Breast examination findings (100%, 100%), most of them had no Fracture History (94.4%, 94.2%), consumed coffee and tea (64.8%, 66.7%) and majority of the menopausal women had diabetes (37.0%, 37.5%) as a co-morbid condition in Yoga and Non-Yoga group respectively.

It can be inferred that the mean values of clinical (continuous) variables were Water intake in litres ( $1.9 \pm 0.41$ ,  $1.9 \pm 0.4$ ), Height in cms ( $156.2 \pm 5.7$ ,  $156.2 \pm 5.6$ ), weight in kg ( $63.0 \pm 6.8$ ,  $63.0 \pm 6.6$ ) BMI ( $25.8 \pm 2.2$ ,  $25.8 \pm 2.1$ ), Waist Circumference in cms ( $95.0 \pm 8.2$ ,  $94.8 \pm 8.1$ ) respectively.

In the present study, most of the women had severe somatic symptoms (63.9%, 66.7%) in the pretest in Yoga and Non-Yoga group respectively. Whereas majority (61.1%) of them experienced mild somatic symptoms and significant (34.3%) of them experienced moderate level of somatic symptoms after post test in the Yoga group.

Most of the women had severe psychological symptoms (62.1%, 65.8%) in the pretest in Yoga and Non-Yoga group respectively. Whereas majority (70.4%) of them experienced mild psychological symptoms and significant (29.6%) of them experienced moderate level of psychological symptoms after post test in the Yoga group.

Most of the women had moderate urogenital symptoms (42.6%, 48.3%) in the pretest in Yoga and Non-Yoga group respectively. Whereas majority (71.3%) of them experienced mild urogenital symptoms and significant (21.3%) of them experienced moderate level of urogenital symptoms.

Coming to total menopausal symptoms, most of the women had severe menopausal symptoms (71.3%, 82.5%) in the pretest in Yoga and Non-Yoga group respectively. Whereas majority (72.2%) of them experienced mild menopausal symptoms and significant (27.8%) of them experienced moderate level of menopausal symptoms after post test in the Yoga group.

In the present study the mean values of Menopause Rating Scale in somatic domain of Yoga group before Yoga was  $9.2 \pm 2.2$ . The mean psychological domain of Yoga group before Yoga was  $10.4 \pm 1.9$ . The mean uro-genital domain of Yoga group before Yoga was  $5.9 \pm 2.1$ . The mean total menopausal symptoms of Yoga group before Yoga was  $25.4 \pm 4.7$ . With regard to prevalence, majority of them had severe (63.9%) somatic symptoms, majority of them had severe (62.1%) psychological symptoms and only significant of them experienced severe (36.1 %) uro-genital symptoms.

The Effectiveness of Yoga in controlling menopausal symptoms (domain-wise and total) within groups among Yoga and Non-Yoga group of Menopausal women are as follows : The mean improvement was  $5.3 \pm 1.4$  and the same was statistically very highly significant ( $P < 0.001$ ). The mean psychological domain of Yoga group before Yoga was  $10.4 \pm 1.9$  and after Yoga was  $4.0 \pm 1.2$ . The mean improvement was  $6.4 \pm 1.8$  and the same was statistically very highly significant ( $P < 0.001$ ). The mean urogenital domain of Yoga group before Yoga was  $5.9 \pm 2.1$  and after Yoga was  $2.7 \pm 1.2$ . The mean improvement was  $3.2 \pm 1.5$  and the same was statistically very highly significant ( $P < 0.001$ ).

The mean total menopausal symptoms of Yoga group before Yoga was  $25.4 \pm 4.7$  and after Yoga was  $10.6 \pm 2.7$ . The mean improvement was  $14.7 \pm 3.3$  and the same was statistically very highly significant ( $P < 0.001$ ).

In the current study Menopause specific quality of life is determined by the following findings: Most of the menopausal women were under the category menopausal symptoms – bothered great extent (88.0%, 90.0%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (63.0%) of them were having



menopausal symptoms- not bothered and significant (37.0%) of them were having menopausal symptoms - bothered to some extent after post test in the Yoga group.

There is positive correlation between somato-vegetative domain of MRS and the MENQOL (vasomotor and physical domain) 0.409, psychological domain of MRS and the MENQOL (psychosocial) 0.225, uro-genital domain of MRS and MENQOL (sexual) in the Yoga group after the intervention when compared to the non Yoga group. The post test Yoga group domains determined as 16.7%, 5.1% and 26.2% respectively. In the Non-Yoga group the pre MRS domains namely somato-vegetative, psychological and urogenital were correlated with respective MENQOL domains and they were positively correlated except Psychological domain ( $P < 0.001$ ).

The findings of this study show that there is a reduction in menopausal symptoms in Yoga group of menopausal women thus proving it to be effective when compared with Non-Yoga group of menopausal women. Yoga as an alternative therapy is safe, rejuvenating, free from side effects and can be practised in their own home settings. Women in menopause showed a positive attitude towards performing Yoga, they showed readiness to practice.

*Chapter I*  
*Introduction*

---

# CHAPTER I

## INTRODUCTION

### Background of the Study

Women of all ages are very precious and need to look after themselves. The mature woman has a larger role to play in the family and the society, so she must be fit, graceful and full of “POISE”! Aging is the natural progression of changes in structure and function that occur with the passage of time in the absence of known disease. Aging of the female reproductive system begins at 20 weeks gestation with regard to follicle atresia and proceeds as a continuum. It consists of a steady loss of oocytes from atresia or ovulation, and does not necessarily occur at a constant rate. Because of the relatively wide age range (40-58 yrs) for natural menopause, chronologic age is a poor indicator of the beginning or the end of the menopause transition.

By 2025, worldwide, the number of postmenopausal women is expected to rise to 1.1 billion. Life expectancy for women worldwide was 65 years in 1998 (79 y in more developed countries). This is expected to rise to 72 years worldwide by 2025 (82 y in developed countries).

In India one fifth of women aged 40-41 have reached menopause and the prevalence of menopause increases rapidly thereafter to 65% at the age 48-49 (National Family Health Survey 2005-2006). As longevity increases, the population of menopausal age group women is ever rising even in India. According to the Indian Menopausal Society, the number of menopausal women comes in around 43 million. The data of a multi-centric study conducted by the IMS in 2010 across the country

show that menopausal age among women is now between 47 and 52 years as against the previous 40 – 45 years.

Menstrual irregularities are known to occur at all ages of reproductive life in women from menarche (onset of menses) to menopause (cessation of menses). A normal menstrual period ranges from 25 to 35 days with bleeding for 4 to 6 days and menstrual blood loss (MBL) of 30 to 50 ml. The median length of menstrual cycle varies at the extremes of reproductive life i.e. following menarche and preceding menopause. Immediately after menarche, the menstrual cycles are often prolonged and unpredictable due to poor functioning of ovaries and immaturity of pituitary gland but the cycles regularise by the age of 18-20 years. In child-bearing age (20 to 35 years) the menstrual cycles are generally regular, except for a few months after abortion or delivery (lactation period). In the late reproductive years, the menstrual irregularity is more common and it heralds the beginning of perimenopause.

Perimenopausal menstrual irregularities are the result of physiologic reduction or depletion of oocytes which are healthy. The remaining oocytes of the ovary are of lesser competence and cannot sustain the normal hormone balance. In majority of women this menstrual dysfunction persists till menopause (complete cessation of menses). In the period of perimenopause, the previously regular periods likely to become irregular with changes in intermenstrual lengths. The perimenopause is divided into two stages: Early perimenopause – The menstrual cycles may be short or prolonged. Late perimenopause – Characterized by lengthened intermenstrual periods, that result in prolonged and irregular menstrual cycles. In some women, the menstrual bleeding may be extended and heavy requiring immediate therapeutic attention.

The normal cyclic periods are the result of normal balance connecting estrogen and progesterone (ovarian hormones). In the perimenopause, disturbance of normal hormonal sequence results in erratic response of the endometrium (inner lining of uterine cavity). In most perimenopausal women, major source of estrogen production is the ovary. However, in obese women the excess of adipose (fat) tissue also produces high amount of estrogen. The unopposed estrogen action can cause thickening of endometrium resulting into irregular and heavy bleeding. Some of the changes in the endometrium may have malignant potential. Other structural changes like uterine fibroids, polyps, adenomyosis, ovarian tumours and pelvic infections can also cause irregular and heavy menstrual bleeding. The menstrual dysfunctions at perimenopause are of different types: Regular periods with excessive cyclic bleeding, short menstrual periods with normal or excessive bleeding, infrequent and delayed periods with normal or excessive and prolonged bleeding, irregular and non-cyclic prolonged periods with scanty or excessive bleeding.

Middle age is that time of life when each passing day makes one feel two days older. One doesn't look forward to celebrating one's Birthdays. Midlife is really a difficult, stressful and awkward period. One is neither old nor young and hence gets sandwiched between the two great generations and suffers from BLUES, which are many irritability, lethargy, mood changes and depression top the list along with lack of sleep, confidence, motivation and libido. "Empty Nest Syndrome" adds fuel to fire. The children going abroad or for higher studies or getting married leaves a caring mother all alone in her nest to suffer. The crying spells and suicidal tendencies also hover into one's mind.

Let us understand the science of moods and redo some of the basics. Limbic system is the part of the brain which controls the moods, emotions and reactions, through its connections in the brain. The chemicals which are needed for smooth functioning of the brain are called Neurotransmitters. The two important Neurotransmitters are Serotonin and Dopamine. Both are secreted from protein derivatives called amino acids, which we consume through food in the presence of other nutrients like Calcium, Magnesium, Vitamins, Folic acids and others. Their levels directly control the secretion of neurotransmitters and hence one's mood. Serotonin controls Anxiety, Depression and ultimately the mood and Dopamine control memory, cognition and stress management.

In addition to Neurotransmitters, hormones also play a major role in our moods. Usually the female hormones like Oestrogens and Progesterone have a positive effect on the levels of Serotonin and hence they keep a woman happy and ultimately healthy. These effects are directly observed by a woman throughout her life. These hormone levels change drastically in three important phases in a woman's life such as puberty, pregnancy and menopause and they are manifested sometimes in the form of premenstrual syndrome, puerperal psychosis and menopausal depression.

Menopause can be said as permanent cessation of menstruation and fertility. It is an important time of transition in a woman's life, a time that challenges nurses to provide critical evaluation, counselling and support. The hallmark of menopause is ovarian senescence and the subsequent decrease in oestrogen and progesterone. This hormonal decline is accompanied by changes throughout the body including the uterus, breasts, urethra, vagina, skin, bone, muscles, blood vasculature and brain.

Most US postmenopausal women (51%) surveyed in a 1998 NAMS-sponsored Gallup Poll reported being happiest and most fulfilled between ages 50 and 65 compared with when they were in their 20s (10%), 30s (17%), or 40s (16%). Many women reported improvement in various areas of their lives since menopause. They reported a sense of personal fulfilment, an ability to focus on hobbies or other interests, and improved relationships with their spouse or partner and with friends. Most (51%) said their sexual relationships had remained unchanged. Lifestyle behavioural changes were often initiated during this midlife period.

Fortunately, menopause is now better understood and more openly discussed than ever before. It can be viewed as a sentinel event that presents a unique opportunity for women, working with their healthcare providers, to evaluate personal health and improve health practices. Collaboration between the woman and her provider, characterised by mutual respect and trust, is the goal of menopause counselling.

An average menopause age of 50-51 was reported in studies on women in the USA, Italy, Iran and Slovenia, whereas the average age was reported as being between 47 and 50 in Korea, Lebanon, Turkey, Singapore, Greece, Morocco, Mexico and Taiwan. However in some developing countries like Indonesia and Philippines, the median age of natural menopause is considerably earlier at 44 years. Results from cross-sectional studies have indicated that endocrine changes characteristic of the onset of the perimenopause begin at around age 45. But there is no way to predict when an individual woman will have menopause or begin having symptoms suggestive of menopause.

Just as menarche and pregnancy, menopause, another physiologic state in the life of a woman can be extremely symptom producing and may be perceived as an illness. Menopause is not a disease, but it does have a serious clinical sequel. Like menarche, menopause is also a milestone event in a women's life however no celebration earmark menopause. Especially in South Indian culture where menarche is celebrated with all pomp and pleasure inviting the members of the family to bless the girl though the culture does not mark menopause as an event. It is a period of transition in every woman's life regardless of her social and economic status.

During the transition from the reproductive years through menopause and beyond, a woman experiences many physical changes, most of which are normal consequences of both menopause and aging. Some of the physical changes observed around menopause may be signs of illness that develop during midlife, such as diabetes mellitus. Sometimes, health problems arise when changing hormone levels and the physical effects of aging are coupled with an individual's genetic makeup, certain unhealthy lifestyles, and other stresses of midlife.

The *2001 Stages of Reproductive Aging Workshop (STRAW)* proposed nomenclature and a staging system for ovarian aging including menstrual and qualitative hormonal criteria to define each stage.<sup>1-4</sup> The STRAW staging system is widely considered the gold standard for characterising reproductive aging through menopause, just as the Marshall-Tanner Stages characterise pubertal maturation. Research conducted during the past 10 years has advanced knowledge of the critical changes in hypothalamic, pituitary and ovarian function that occur before and after the final menstrual period. These advances were the topic of a follow-up workshop "*STRAW+ 10: Addressing the Unfinished Agenda of Staging Reproductive Aging*"



(STRAW + 10). STRAW + 10, held in Washington, DC, on September 20 and 21, 2011, reviewed these scientific advances and updated the STRAW criteria.

The revised staging system provides a more comprehensive basis for classification and assessment, from the late reproductive stage through the menopausal transition and into post menopause. Its application should improve comparability of studies of midlife women by establishing clear criteria for ascertaining women's reproductive stage. The STRAW + 10 recommendations are expected to improve guidance for classifying the ovarian status of midlife women in the research setting while advancing efforts to translate this new science for clinicians and women.

	<b>Menarche</b>					<b>FMP (0)</b>				
Stage	-5	-4	-3b	-3a	-2	-1	+1a	+1b	+1c	+2
Terminology	<b>REPRODUCTIVE</b>				<b>MENOPAUSAL TRANSITION</b>		<b>POSTMENOPAUSE</b>			
	Early	Peak	Late		Early	Late	Early			Late
					<i>Perimenopause</i>					
Duration	<b>Variable</b>				variable	1-3 years	2 years (1+1)	3-6 years	Remaining lifespan	
<b>PRINCIPAL CRITERIA</b>										
Menstrual Cycle	Variable to regular	Regular	Regular	Subtle changes in Flow / Length	Variable Length Persistent > 7- day difference in length of consecutive cycles	Interval of amenorrhea of >=60 days				
<b>SUPPORTIVE CRITERIA</b>										
Endocrine FSH AMH Inhibin B			Low Low	Variable Low Low	↑ Variable Low Low	↑ >25 IU/L** Low Low	↑ Variable Low Low	Stabilizes Very Low Very Low		
Antral Follicle Count			Low	Low	Low	Low	Very Low	Very Low		
<b>DESCRIPTIVE CHARACTERISTICS</b>										
Symptoms						Vasomotor symptoms Likely	Vasomotor symptoms Most Likely			Increasing symptoms of urogenital atrophy

\* Blood drawn on cycle days 2-5 | = elevated

\*\* Approximate expected level based on assays using current international pituitary standard

**Fig. 1 Staging System for Reproductive Aging in Women – STRAW + 10 - 2011 Revised Version**

Dutta et al (2013) conducted a population based study to estimate the prevalence of menopausal symptoms in Poonamallee block of Thiruvallur District. The study included 780 post-menopausal women and the most frequently reported ones were vasomotor symptoms ((60.9%), followed by sleep related symptoms (40.1%) and anxiety (35.4%). Among them only 46% of the postmenopausal women who had any one symptom had taken treatment. The presence of post-menopausal symptoms may decrease the health related quality of life in women, because a majority still do not take any treatment for these symptoms.

There are a variety of treatment modalities to treat menopausal symptoms among postmenopausal women like Hormone Replacement Therapy, Mind-Body therapies like Yoga, exercise prescription, Complementary and alternative therapies which include alternative whole medical systems, biologically based practices, manipulation and body based therapies and energy based therapies, Indian and western herbs.

Providing integrative healthcare for women during the menopause transition involves incorporating different avenues of healing. Population studies show that 60% of women use complementary and alternative medicine and 26% visit practitioners in gynaecology and other allopathists. In the Public health, Yoga is one of the important Mind Body Therapies, which is found to be more effective in improving quality of life with minimal health risks and no side effect.

Complementary and Alternative Medicine in Nursing and Midwifery bring together social science researchers who are investigating the relationship and integration of CAM with nursing. Mind and body are viewed as separate entities (Grosz 1994). CAM often conceptualises the mind / body as integrated proving the relationship of mind and body. This is very much applicable to Yoga as a CAM which shows the relationship

of the provider to the process of healing. In this study the researcher as provider serves more as a guide helping women in post menopause to monitor their own bodies. Here the practitioner and the patient mutually and reciprocally determine a course of treatment – Yoga. This places the provider as peripheral and the relationship as central to the healing process. A central difference between nurses using CAM and nurses who did not use CAM lay in their descriptions of their autonomy as care practitioner.

Yoga practice is an enjoyable way of learning how to “feel yourself” again. Yoga is not only a physical and mental discipline but also an emotional journey and a spiritual path. Yoga not only tone and condition the body’s exterior, but they also work wonders internally. The benefits of Yoga practice include long, lean muscles, correct posture, improved breathing, improved sleep, enhanced digestion, better circulation, a relaxed nervous system and a fortified immune system. Being able to draw the mind inward, away from outside distractions, will clear space in our brains for what’s essential. Disciplining the mind through meditation is also healing. Yoga is also an emotional journey. Yoga seeks to bring out the best in a person, the joy that is at the core of every being.

Being an invaluable gift from ancient tradition of India, Yoga embodies unity of mind and body, thought and action, a holistic approach that is valuable to our health and well-being. The researcher planned to conduct the present study to assess the effect of Yoga on Menopausal Symptoms in the Thiruvallur District, the experimental group (Yoga group) being selected in Poonamallee block from Thiruverkadu Primary Health Centre and the control group (Non-Yoga) being selected in Puzhal block from Naravarikuppam Primary Health Centre.

The menopausal women need support from family and friends most of the time and they receive advise and help from medical practitioners, sometimes they even will be on medications as they experience menopausal symptoms in varying degrees. These women may find it difficult to express their symptoms. Community health nurses are the major force in public health setting working at various levels of prevention for health promotion, specific protection, early identification and treatment, disability limitation and rehabilitation. Yoga can alleviate the sufferings of the midlife women at all levels of Prevention.

## **Significance and Need for the Study**

For the last four decades, Hormone Replacement Therapy (HRT) has been the mainstay of management of menopausal problems. The western ideology influenced the rest of the world so much that menopause was thought of as a disaster happening to women and they got psyched into using hormones even before the ‘calamity’ of menopause would strike them. It was amazing that there were no long term systematic randomized studies to back up the concept of HRT. When the studies were performed, HRT did not appear to be as safe and beneficial as it was made out to be.

India possesses an unmatched heritage represented by its ancient systems of medicine, which are a treasure house of knowledge for both preventive and curative health care. Yoga is an ancient Indian art based on an extremely subtle science of body, mind and the soul. The regular practice of Yoga not only makes the body strong and flexible; it has been scientifically proved that Yoga improves the functioning of the respiratory, circulatory, digestive and endocrine systems. Yoga brings emotional stability and clarity to the mind. There are asanas which involve slow non jerky movements of ligaments, muscles and joints which strengthen them scientifically and energise every part of the body. Hence Yoga is for therapeutic use.

Yoga is a discipline to advance one’s inherent power in a balanced manner. It offers the ways to achieve complete self-realisation. The exact meaning of the Sanskrit word Yoga is ‘Yoke’. Yoga can thus be defined as a means of uniting the individual spirit with the universal spirit of God. According to Maharishi Patanjali, Yoga is the suppression of modifications of the mind.

The concepts and practices of Yoga originated in India about several thousand years ago. Its founders were great saints and sages. The great Yogis presented sensible interpretation of their experiences of Yoga and brought about a realistic and scientifically sound method within every one's reach. Today Yoga, is no longer restricted to solitary persons, saints, and sages; it has entered into our everyday lives and has aroused a worldwide awakening and approval in the last few decades. The discipline of Yoga and its methodologies has now been reoriented to suit modern sociological needs and lifestyles. Experts of various branches of medicine including modern medical sciences are realising the role of these techniques in the prevention and mitigation of diseases and promotion of health.

Yoga is one of the six systems of Vedic philosophy. Maharishi Patanjali, rightly called "The Father of Yoga" compiled and refined various aspects of Yoga systematically in his "Yoga sutras" (maxims). He advocated the eight folds path of Yoga, popularly known as "Ashtanga Yoga" for all-round development of human beings and they are:- Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana and Samadhi. These components advocate certain restraints and observances, physical discipline, breath regulations, restraining the sense organs, contemplation, meditation and Samadhi. These steps are believed to have a prospective for improvement of physical health by enhancing circulation of oxygenated blood in the body, retraining the sense organs thereby inducing serenity and calmness of mind. The practice of Yoga prevents psychosomatic disorders and improves an individual's resistance and ability to endure stressful situations.

Complementary and Alternative Medicine is swiftly growing worldwide. In India there is resurgence of interest in Indian Systems of Medicine. Recognizing the

Universal appeal of Yoga, on 11<sup>th</sup> December 2014, the United Nations proclaimed 21<sup>st</sup> June as International Yoga Day by resolution 69/131 which is then approved by United Nations in 2015, its celebration is set on June 21<sup>st</sup> – the day of summer solstice: a real breakthrough witnessed. International Yoga Day aims to hoist awareness world wide of the many benefits of practising Yoga.

Indian Menopausal Society Consensus in agreement with the International recommendations has detailed relevant practice guidelines where it has mentioned that dietary estrogens are better alternatives for estrogen replacement therapy for osteoporosis prevention in women with increased risk of breast or uterine cancer or in those women who are not willing for estrogen replacement therapy. It is advisable to use Yoga and exercises which are important non hormonal modalities and lifestyle factors that provide protection against osteoporosis, cardiovascular disease and sleep disturbances. They additionally help in boosting the confidence of these women and improving the quality of life. Peri-Menopausal women can achieve a much better quality of life if they practice Yoga regularly.

A prospective non-randomized control study was conducted by (Nayak et al 2011) to assess the effect of Yoga therapy on physical and psychological quality of life of 216 peri-menopausal women with 12 weeks of intervention, The subjects were divided into 2 groups with either Yoga therapy (n = 111) or exercise ( n = 105) as the interventional tool. The symptoms control and QOL before and after intervention in both the groups were assessed by using the menopausal QOL questionnaire. The perimenopausal symptoms in all the four domains were improved by Yoga therapy, thus significantly improving the overall QOL compared to the control group. The study concluded that Yoga therapy is effective in managing the distressing perimenopausal



symptoms. It is easy, safe, non – expensive alternative therapy helping the well-being of perimenopausal women and must be encouraged in the regular management of perimenopausal symptoms.

Apollo College of Nursing has adopted 10 villages and is constantly providing services through home health services, free treatment in Rural Health Centre, women's health camps and awareness programmes. Women from adolescence, through pregnancy and reproductive period are given importance. The researcher being at the end of service delivery understood the felt need of Menopausal women as this endocrine deficient state puts women at risk of various somatic, psychological and urogenital symptoms of menopause at various levels of severity.

The researcher with her two decades of experience in Public Health / Community Health Nursing has been showing great interest in managing the woman's health issues. During her service in the Public health she had been a part of caring young women who have just attained menarche to elderly women with osteoporotic changes. The researcher identified that menopausal women's health problems are unaddressed. A camp conducted by Apollo College of Nursing for Midlife women had one session as Yoga. The researcher with her training and experience in selected Yogasanas, demonstrated the same to them which they eventually repeated. Women who participated reported that they felt light in the body and mentally relaxed. The researcher realised the need for improving the wellness of menopausal women through Yoga thus escalating their quality of life. Yoga as a mind body intervention can thus help manage menopausal symptoms in a natural way. Yoga serves as the best alternative to the chemical based hormone replacement therapy and it is safe with no adverse effects.

## **Statement of the Problem**

An Experimental Study to assess the Effectiveness of Yoga upon Menopausal symptoms in Menopausal Women at selected Primary Health Centres of Thiruvallur District, Chennai.

## **Objectives of the Study**

1. To assess and compare the effect of Yoga on menopausal symptoms before and after administration of Yoga between Yoga and Non –Yoga groups of menopausal women.
2. To assess and compare the effect of Yoga on quality of life between Yoga and Non –Yoga groups of menopausal women.
3. To correlate menopausal symptoms with quality of life among Yoga and Non –Yoga groups of menopausal women.
4. To find out the association of pre and post test menopausal symptoms with the selected demographic variables in Yoga and Non–Yoga groups of menopausal women.
5. To find out the association of pre and post test menopausal symptoms with the selected clinical variables in Yoga and Non–Yoga groups of menopausal women.
6. To find out the association of pre and post test quality of life with the selected demographic variables in Yoga and Non–Yoga groups of menopausal women.
7. To find out the association of pre and post test quality of life with the selected clinical variables in Yoga and Non–Yoga groups of menopausal women.
8. To determine the level of satisfaction regarding Yoga among Yoga group of menopausal women.

## **Operational Definitions**

### **Effectiveness**

In this study it refers to the outcome of Yoga with regard to reduction in menopausal symptoms and improvement in Quality of Life of postmenopausal women. The effectiveness is measured by comparing the mean scores of Menopausal Symptoms and Quality of Life in Yoga and Non-Yoga group of menopausal women.

### **Menopausal Symptoms**

It refers to the symptoms associated with menopause experienced by postmenopausal women under three domains namely Somato-vegetative, Psychological and Urogenital domains which is assessed using Standardised Menopause Rating Scale developed by Lother A.J.Heinemann, Berlin Center for Epidemiology and Health Research.

### **Menopausal Women**

It refers to women who belong to postmenopausal period after the Final Menstrual Period (FMP) and in the stages of +1b, +1c and + 2 of staging system for reproductive aging in women (revised STRAW + 10 Staging system (fig.1) and experiencing menopausal symptoms.

### **Postmenopausal Period**

It is the period after completion of 1 year from the cessation of menstrual period in the Stages of Reproductive Ageing retrospectively as mentioned in the Fig 1, revised STRAW + 10 staging system.

## **Yoga**

It refers to performing slow non-jerky movements of ligaments, muscles and joints which strengthen them scientifically and energise body and mind. The selected Yoga will be demonstrated by the researcher who is duly qualified to teach yoga and performed by the study participants under the supervision either in empty stomach or in the evening after tea for a period of 6 weeks and for 6 days in a week. Duration of each session is approximately 60 minutes.

The Yoga techniques selected are performed as follows:

- Warm Up Asanas
- Asanas (Ardhakadichakrasana, Padahastana, Pavanamuktasana, udhanapadasana, Salabhasana, Bhujangasana, Makarasana, Janusirana, Balasana, Utianabandha)
- Cool Down Asanas - Pranayama (Nadishudhi, sheethali), Dhyana and Shanthi asana.

## **Quality of Life**

It refers to health related aspects bothering menopausal women, which is intended to measure the extent to which the individual is affected by menopausal symptoms under the following domains namely vasomotor, psychosocial, physical and sexual as measured by standardised questionnaire developed by Hilditch J.R & Lewis J.E known as Menopause Specific Quality of Life questionnaire (MENQOL).

## **Satisfaction**

In this study it refers to feeling of gratification attained by menopausal women with Yoga using satisfaction rating scale developed by the researcher.

## Assumptions

The study assumes that:

- Menopause is a normal consequence of the ageing process.
- Perception of menopausal symptoms varies from one individual to another.
- Menopausal symptoms are manageable when treated properly.
- Yoga is an ancient Indian science and art based on an extremely subtle science of body, mind and the soul.
- Indian women accept menopause as a phase of life and there is resistance to using hormones to treat it.
- Yoga poses stretches muscles and increases range of motion thus improving flexibility by regular practise.
- Yoga can improve circulation in hands and feet thus promoting blood flow
- Yoga encourages to relax, slow breath and focus on the present. It is proven to shift the balance from sympathetic to parasympathetic nervous system.

## Null Hypotheses

- Ho<sub>1</sub>:** There will be no significant difference in the menopausal symptoms before and after Yoga among the Yoga and Non-Yoga groups of menopausal women.
- Ho<sub>2</sub>:** There will be no significant difference in the effect of Yoga upon quality of life between Yoga and Non-Yoga groups of menopausal women.
- Ho<sub>3</sub>:** There will be no correlation between menopausal symptoms and quality of life in Yoga and Non-Yoga groups of menopausal women.

- H<sub>04</sub>:** There will be no significant association between selected demographic variables and menopausal symptoms before and after administration of Yoga among the Yoga and Non-Yoga groups of menopausal women.
- H<sub>05</sub>:** There will be no significant association between selected clinical variables and menopausal symptoms before and after administration of Yoga among the Yoga and Non- Yoga groups of menopausal women.
- H<sub>06</sub>:** There will be no significant association between selected demographic variables and quality of life before and after administration of Yoga among the Yoga and Non-Yoga groups of menopausal women.
- H<sub>07</sub>:** There will be no significant association between selected clinical variables and quality of life before and after administration of Yoga among the Yoga and Non-Yoga groups of menopausal women.
- H<sub>08</sub>:** The pretest and post test menopausal symptoms in Yoga and Non-Yoga group of menopausal women will not be significantly predicted by their associated clinical variables.
- H<sub>09</sub>:** The pretest and post test quality of life in Yoga and Non-Yoga group of menopausal women will not be significantly predicted by their associated clinical variables.

### **Delimitations**

The study was limited to

- Only postmenopausal women with symptoms.
- Menopausal women who were residing in Thiruvallur District and were belonging to the selected primary health centres.
- Only Yoga as intervention.
- The period of data collection was only 11 months.

## **Conceptual Framework**

### **Based on Pender's revised Health Promotion Model**

Conceptual Framework presents logically constructed concepts to provide general explanation of the relationship among the concepts of the research study (Sharma, SK 2015). A conceptual model shows how various concepts are interrelated and applies theories to predict or evaluate consequences of alternate actions. According to Fawcett (1995), each conceptual model provides a systematic structure and a rationale for scholarly activities. A conceptual model 'gives direction to the search for relevant questions about phenomena and suggests solutions to practical problems'. The model also gives direction for planning, research design, data collection and interpretation of findings (Polit & Beck 2010)

The Conceptual Framework of the present study is based on a **Revised Health Promotion Model proposed by Pender and Colleagues (2011)**. This model attempts to account for health – promoting behaviors that improve well-being and develop human potential. This frame work was selected for the present study as it provides a way of understanding and predicting how Yoga practice in a phased manner helps in managing menopausal symptoms thus promoting health of the postmenopausal women.

Health promotion is directed at increasing an individuals' level of well being. The Health Promotion Model describes the multi-dimensional nature of persons as they interact within their environment to pursue health.

The Model focusses on the following three areas :

- **Individual Characteristics and Experiences** ( Including prior related behavior and personal factors characterised as biological, psychological and socio – cultural)

- **Behavior – specific knowledge and affect** (Including benefits and barriers to action, perceived self efficacy, activity related affect, interpersonal influences, situational influences)
- **Behavioral outcomes** (Including the commitment to a plan of action and immediate competing demands such as family and work commitments).

Pender's model represents a multitude of factors affecting Health Promotion. Behaviour, which is the end point or outcome of the Health promotion Model.

The frame work was selected for the present study as it provides a way of understanding and predicting how Yoga practice in a phased manner helps in managing menopausal symptoms.

### **Personal Factors**

- Personal factors are categorised as biological, psychological and socio-cultural.
- These factors are predictive of a given behaviour and shaped by the nature of the target behaviour being considered.
- **Personal biological factors** – Here the personal biological factors of Menopausal women include variables such as age, marital status, body mass index, waist circumference , aerobic capacity.
- **Personal psychological factors** - include variables such as self esteem, self motivation, personal competence, perceived health status and definition of health.
- **Personal socio-cultural factors** - include variables such as race, ethnicity, education, occupation and socioeconomic status.



### **Perceived benefits of action**

- Anticipated positive outcomes were reduction in menopausal symptoms and improvement in quality of life that will occur from the healthy behaviour, the so called Yoga practice

### **Perceived barriers to action**

- Anticipated, imagined or real blocks and personal costs of understanding a given behaviour.

### **Perceived self efficacy**

- Judgment of personal capability of menopausal women themselves to organise and execute the health-promoting behaviour Yoga with the assistance of the researcher.
- Perceived self efficacy influences perceived barriers to action so higher efficacy result in lowered perceptions of barriers to the performance of the behaviour.

### **Activity related affect**

- Subjective positive or negative feeling that occurs before, during and following behaviour based on the stimulus properties of the behaviour itself.
- Activity-related affect influences perceived self-efficacy, which means the more positive the subjective feeling, the greater the feeling of efficacy. In turn, increased feelings of efficacy can generate further positive affect.

### **Interpersonal influences**

- Cognition concerning behaviours, beliefs, or attitudes of the others. Interpersonal influences include: norms (expectations of significant others), social support (instrumental and emotional encouragement) and modelling (vicarious learning through observing others engaged in a particular behaviour).

- Primary sources of interpersonal influences are families, peers, and healthcare providers.

### **Situational influences**

- Personal perceptions and cognitions of any given situation or context that can facilitate or impede behaviour.
- Situational influences may have direct or indirect influences on health behaviour.

### **Behavioural Outcome**

Expected outcome due to change in behaviour is menopausal symptom reduction

### **Commitment to plan of action**

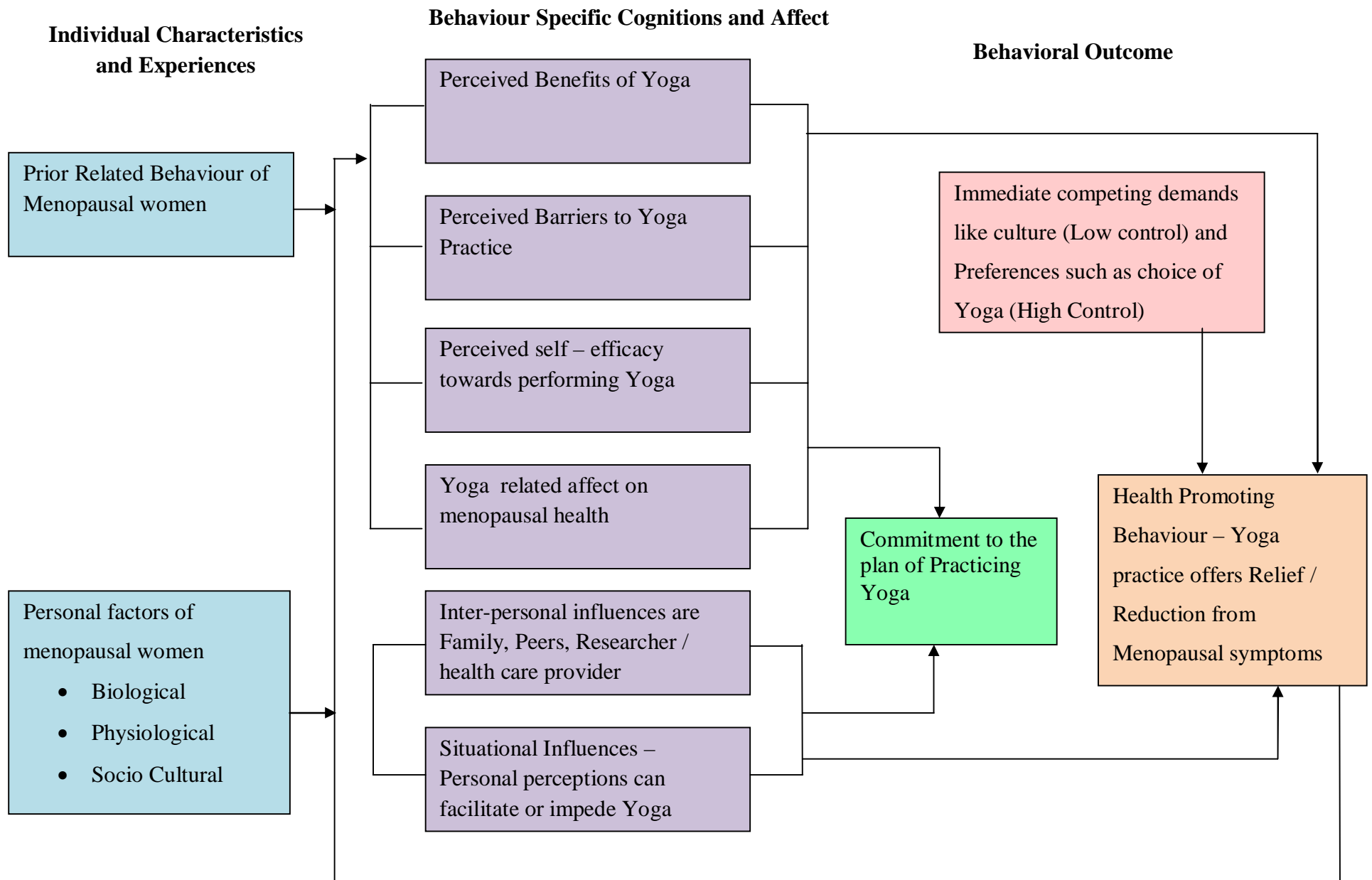
The concept of intention and identification of a planned strategy leads to implementation of healthy behaviour which is practicing Yoga.

### **Immediate competing demands and preferences**

- Competing demands are those alternative behaviour over which individuals have low control because there are environmental contingencies such as work or family care responsibilities.
- Competing preferences are alternative behaviour over which individuals exert relatively high control, such as choice of ice cream or apple for a snack. This could be very well compared to preference for Yoga Exercise, swimming aYoga

### **Health promoting behaviour**

- Endpoint or action outcome directed toward attaining positive health outcome such as optimal well-being, personal fulfilment, and productive living. Practising Yoga can provide reduction in menopausal symptoms, thereby getting a state of well-being, personal fulfilment and productive living.



**Fig .2 Conceptual Framework on Effect of Yoga upon menopausal symptoms based on Pender's revised Health promotion model**

## **Summary**

This chapter I has dealt with three parts. Introduction which includes background of the study, significance and need for the study. aims and objectives which included statement of the problem, objectives of the study, operational definitions, assumptions, null hypotheses, delimitations and conceptual framework which included Pender's revised health promotion model.

*Chapter 11*  
*Review of literature*

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## **CHAPTER II**

### **REVIEW OF LITERATURE**

A review of literature involves the systematic identification, location, scrutiny and summary of written materials that contain information on a research problem identified (Polit & Beck 2010). A review of literature is a critical analysis of earlier scholarly work on a chosen topic.

An extensive search of research and non research literature was performed in electronic search engines such as PubMed / Medline, EMBASE, PsychInfo and Cochrane Central Register of Controlled trials for trials / studies reported in English. Also direct searches of specific journals and backward searches through reference lists of related publications were done.

Review of literature for the present study aimed to synthesise existing evidence of studies on various study designs, with a special focus on randomised controlled trials on the use of pharmacologic and non – pharmacologic interventions to manage vasomotor, psychological and urogenital symptoms in perimenopausal and postmenopausal population. The review also focussed on Yoga as a mind body intervention in menopause and also in other conditions.

The review of literature for the present study is organised under the following headings: Literature reviewed related to the research work and Development of Nursing Evidence Based Practice Protocol.

The Nursing Evidence Based Practice Protocol include Nursing Evidence Based Practice question development, PRISMA Flow Diagram, Characteristics of

included papers (Study design and Intervention wise) in the present study and Individual Evidence Summary.

The literature reviewed related to research work is grouped further under the following headings :

- Menopause and menopausal symptoms
- Menopause Specific Quality of Life tool
- Pharmacologic modalities and its effect on menopausal symptoms
- Non – Pharmacologic modalities and its effect on menopausal symptoms
- Yoga and its effect on different conditions
- Yoga and its effect on menopausal symptoms

### **Literature related to Menopause and Menopausal Symptoms**

**Gold et al (2017)** carried out a longitudinal analysis of changes in weight and waist circumference in relation to incident vasomotor symptoms: the Study of Women's Health Across the Nation (SWAN). Data from 10 follow-up visits for 1,546 participants reported no VMS at baseline. They were modeled for time to first symptomatic visit in relation to concurrent BMI and waist circumference and change in weight and waist circumference during early and late menopause using discrete survival analyses, adjusting for covariates. Results showed that Greater concurrent BMI and waist circumference were significantly related to greater and frequent ( $\geq 6$  d in the last 2 wk) incident VMS in early menopause and lower VMS risk in late menopause. Hence it is concluded that Concurrent BMI and waist circumference were positively related to incident VMS in early menopause and negatively related in late menopause. Maintaining healthy weight in early menopause may help prevent VMS.

A **PAN India Survey** in 21 chapters of Indian Menopause Society covering east, west, north and southern regions on Age of menopause and determinants of menopausal age was conducted by **Ahuja et al (2016)**. A total of 2184 interviews were conducted, of which 2108 completely filled questionnaires were included in the study. Of the total 2108 entries, 1707 were postmenopausal while 401 entries belonged to peri-menopausal women. About 1415 women had natural menopause while 292 had surgical menopause post hysterectomy. The height, weight and waist circumference were noted for all the women and body mass index (BMI) was calculated. Natural menopause age of Indian women was determined as  $46.2 \pm 4.9$  years. A strong positive correlation ( $P < 0.001$ ) was observed between menopausal symptoms, marriage duration and menopausal age. The mean menopausal age of unmarried women was  $45 \pm 6.3$  years, it was  $46.1 \pm 4.9$  for married women and  $47.9 \pm 4.8$  for widowed. As the age of the woman increases, a trend of increasing waistline has been observed.

**Juliato, Baccaro, Pedro, Gabiatti, Lui-Filho and Costa-Paiva (2016)** conducted a cross-sectional population based household survey on 741 middle aged women to determine the prevalence of urinary incontinence and factors associated with it. The prevalence of UI was 23.6 %. Of these, 48 (6.4 %) had stress urinary incontinence, 59 (7.8 %) urinary urgency, and 70 (9.5 %) had mixed urinary incontinence. vaginal dryness (PR: 1.60; 95 % CI, 1.23-2.08; P=0.001), current or previous hormone therapy (PR: 1.38; 95 % CI, 1.06-1.81; P=0.019), pre / perimenopause (PR: 1.42; 95 % CI, 1.06-1.91; P=0.021), and previous hysterectomy (PR: 1.41; 95 % CI, 1.03-1.92; P=0.031) were associated with a greater prevalence



of UI. Current or previous use of soy products to treat menopausal symptoms was associated with a lower prevalence of UI (PR: 0.43; 95 % CI, 0.24-0.78; P = 0.006).

A descriptive correlational study was conducted by **Suramanjary (2016)** to associate the menopausal symptoms and quality of life among women in Dharapuram. The study sampled 50 women in the age group of 40-60 years by purposive sampling. The mean and standard deviation of menopausal symptoms (13.4, 6.8) and quality of life was 13.3, 7.69. Hence, it concluded that there was a highly significant positive correlation between menopausal symptoms and quality of life. ( $r = 0.8850$ ).

A cross sectional study by **Abou-Raya et al (2016)** was done to determine the frequency and determinants of severity of menopausal symptoms among Egyptian women using the Menopause Rating Scale as a screening tool for identification of menopausal symptoms. A total of 540 women (aged 40-65y) were recruited in this cross-sectional study. Demographic information was collected, and the Menopause Rating Scale questionnaire was administered. Most frequently reported symptoms were joint and muscular discomfort (501, 92.8%) followed by urogenital symptoms (460, 85.2%). A significant association was found between the number of menopausal symptoms and working status of participants ( $r=0.504$ ,  $P=0.005$ ), number of children ( $r=0.474$ ,  $P=0.042$ ), and body mass index ( $r=0.544$ ,  $P=0.006$ ).

A cross-sectional community based study was conducted among 100 post menopausal women in the age group of 40 – 65 years by **Kulkarni, Savitha Rani, Kumar and Manjunath (2016)**. Interview technique was followed to collect details regarding socio-demographic characteristics, postmenopausal symptoms, and factors associated with them in a pretested structured proforma. The results of the study

revealed that the mean age at menarche and menopause was  $13.45 \pm 1.72$  and  $46.7 \pm 5.2$  years, respectively. The most common postmenopausal symptom was joint pain (92%) followed by physical and mental exhaustion (84%), depression (76%), irritability (73%), hot flushes, and night sweats (65%). There was a noteworthy positive correlation between age of the women, duration of life after menopause, and postmenopausal symptoms.

**Mercier, Morin, Lemieux, Reichetzer, Khalife and Dumoulin (2016)** conducted a case study on a patient with stress urinary incontinence and Vulvo Vaginal Atrophy, who was referred to a randomised clinical trial on Pelvic Floor Muscle training. On pre treatment evaluation while on local ET, she showed VVA symptoms on the ICIQ Vaginal Symptoms questionnaire and the ICIQ-Female Sexual Matters associated with lower urinary tract Symptoms questionnaire, and also showed VVA signs during the physical and dynamometric evaluation of the PFM. She was treated with a 12-week PFM training programme. The patient reported a reduction in vaginal dryness and dyspareunia symptoms, as well as a better quality of sexual life after 12 weeks of PFM training. On post treatment physical evaluation, the PFMs' tone and elasticity were improved, although some other VVA signs remained unchanged.

**Gangadharan and Venkatesan (2016)** carried out a literature search on menopause and the role of hormones. The reason that hormone levels may swing in and out of the normal range in perimenopause is that they are determined by the condition of the particular follicle that matures each month i.e., if the woman happens to release a healthy egg, her circulating estrogen, progesterone, FSH, LH and inhibin levels will be normal; if instead she releases a worn-out egg, her hormone levels will

be in the perimenopausal range. Of all these, Inhibin is the most sensitive marker of follicular health. But as of yet, there is no known way to measure inhibin levels. Instead we measure circulating FSH levels because without adequate inhibin, FSH is released in greater than normal amounts. FSH levels more than 20 IU/L are diagnostic of ovarian failure in the perimenopausal age group with vasomotor symptoms. Estrogen is an umbrella term. Each of its 3 major types play a distinct role in the body – Estrone (E1), Estradiol (E2) and Estriol (E3). E1 is the main form of estrogen after menopause. It is produced in fat cells from the male hormone androstenidione. Obese women have high levels of estrone. E2 circulates in the body from menarche to menopause.

**Lampio, Saaresranta, Engblom, Polo and Polo-Kantola (2016)** conducted a follow – up study on predictors of sleep disturbance in menopausal transition. This follow up study was aimed to evaluate risk factors for menopausal sleep disturbances already identifiable before menopause. At baseline, all 81 women were premenopausal. At year-five follow-up, 27 of the women were premenopausal, 40 postmenopausal, and 14 postmenopausal and using hormone therapy. Basic Nordic Sleep Questionnaire was used to study sleep, additional questionnaires evaluated risk factors for sleep impairment. The findings revealed that baseline variables were associated with impaired sleep quality at follow-up: depressive symptoms increased the risk of nocturnal awakenings (OR 1.16 (95% CI 1.02-1.32), p=0.025), morning tiredness (OR 1.22 (95% CI 1.06-1.40), p=0.007), daytime tiredness (OR 1.24 (95% CI 1.06-1.44), p=0.007) and propensity to fall asleep during work or leisure time (OR 1.18 (95% CI 1.01-1.37), p=0.036).

A descriptive – correlational study by **Galeon (2016)** explored the health statuses of the faculty midlifers at University of San Jose – Recoletos, Phillipines. Data were collected through survey among 106 faculty midlifers and analysed using pearson- moment of correlation to determine the relationship between the sociodemographic profile of the research participants and their health statuses. The results revealed that majority (63.21%) of the midlifer’s of the university are females. The age of the participants ranged between 35 and 59 years old. Participants were clustered into three groups such as early bloomers (36-40), bloomers (41-50), and late bloomers (51-59). A little more than half (51.89%) of the faculty midlifers are midlife ‘bloomers’. The remaining parts of the population are almost equally shared by the ‘early bloomers’ (24.53%) and ‘late bloomers’ (23.58%). Furthermore, it was revealed that a good majority of the research participants (65.09%) are physically ‘fair’ while a number of them (30.19%) are found to be physically ‘good’. No one among them possesses a ‘very good’ physical condition. Finally, it was found that an overwhelming majority (91.51%) of the faculty midlifers in the study have ‘very positive’ attitude toward midlife.

A retrospective observational study of outpatient records from Dermatology clinic between 2005 and 2012 was done by **Aboo Backer et al (2015)** in the perimenopausal population. All female patients between 45-55 years of age from an outpatient register that outlines the final diagnosis made by a qualified dermatologist after investigations. A total of 8,156 female patients between the age of 45 – 55 years of age were selected. After analysis of the many variables, the most common dermatoses in the perimenopausal population were eczematous disorders (23.6%), followed by urticaria (12.4%) and papulosquamous disorders (10.7%). Of the eczematous disorders, allergic and photosensitive disorders were found to be more

frequent. The population studied in the current study might be of significance due to complete lack of treatment in the form of Hormone Replacement Therapy (HRT), while routine sun exposure and cultural practices predominate.

A cross-sectional web-based survey was conducted by **Sukha, Taniuchi, Igarashi, Yanagisawa and Ishizuka (2015)** among 1236 Japanese women aged 30-59 years. Of 1236 women surveyed, 1196 eligible participants who were not under treatment for menopausal symptoms were included. Participants were presented with a vignette describing a woman with menopausal symptoms and were then asked a series of questions to assess their recognition of menopausal symptoms, attitude, subjective norm, perceived behaviour control, availability, and intention to seek medical care if they themselves had the problems described in the vignette. The majority (87%) of participants correctly labelled the vignette as menopausal symptoms and 60% expressed an intention to seek medical care if they had the symptoms presented. Logistic regression showed that attitude, subjective norm, and perceived behaviour control were significant predictors of the intention to seek medical care.

A prospective case control study was undertaken on 120 women with or without symptoms of Pelvic Floor Disorders by **Navaneethan, Kekre, Jacob and Varghese (2015)**: Of the 120 postmenopausal women included, 51 had PFD on clinical examination. Of the 51 cases, 28 women had POP and 14 women had Stress Incontinence (SUI) while nine women had both POP and SUI. The study showed that vitamin D levels were significantly lower in women with PFD than those without PFD. Menopausal status of more than 5 years was also significantly associated with PFD. Thus, findings suggest the association of vitamin D deficiency and PFD in

postmenopausal women. In addition, postmenopausal women have a high prevalence of vitamin D deficiency indicating a need to evaluate vitamin D levels in these women.

A literature search was carried out by **Gayathri and Kamala (2015)** on management of menopause through multimodal approach. Hormonal therapy may cause serious effects like cancers hence least preferred. The components of multimodal intervention is explained by the authors as DEC: Diet therapy, Exercise and Counselling. Diet therapy includes phytoestrogens which acts as selective estrogen enzyme modulators. It contains isoflavones which helps in lowering vasomotor symptoms, osteoporosis and cardiovascular disease. Research shows that Asian women who consume soy phytoestrogens have lower incidence of menopausal symptoms and breast cancer. American council on exercise states that a regular exercise programme can help to manage many of the symptoms of menopause. Every woman with menopausal symptoms should be adequately explained about the physiological events and management of symptoms. Counselling will remove fear and reassurance will help to cope with the symptoms.

**Sharma & Mahajan (2015)** carried out a cross sectional study on Menopausal Symptoms and its effect on quality of life among women of urban and rural areas by interviews with the help of a pretested semi-structured standard questionnaire using menopause rating scale and WHO QOL-BREF. The results showed that there was a significant difference between the MRS total scores of the urban ( $14.67 \pm 6.64$ ) and rural ( $16.08 \pm 7.65$ ) group. The severity of symptoms was found more distressing for rural women. The quality of life in urban society was average and better than in rural women.

A Cross sectional study by **Taavoni, Ekbatani and Haghani et al (2015)** was conducted on Postmenopausal women's Quality of sleep and its related factors which included 700 healthy 50-60 old women. The mean sleep scale score was  $7.84 \pm 4.4$ . Significant correlations had seen between sleep disturbance and characteristics of occupational status, educational status, husband's occupational status, economical status ( $P= 0.002$ ). There were no significant correlations between sleep disturbance and other personal characteristics such as age, partner's age, number of children, family size, consumption of tea, coffee or cola. The authors suggested that suitable interventions should be taken to improve sleep quality, which is very important for maintaining the quality of life.

**Sharma, Tandon, Mahajan, Mahajan and Mahajan (2014)** studied by review the link of obesity and osteoporosis and both were associated with significant morbidity and mortality. Both the diseases have common linkage as bone marrow mesenchymal stromal cells are the common precursors for both osteoblasts and adipocytes. Aging may shift composition of bone marrow by increasing adipocytes, osteoclast activity and increasing osteoblast activity resulting into osteoporosis. Adipocytes secrete leptin, adiponectin, adipisin, as well as proinflammatory cytokines, that contributes pathogenesis of osteoporosis. This new concept supports the hypothesis, that the positive correlation of weight and body mass index (BMI) with bone mineral density (BMD) is not confirmed by large population based studies. Thus the previous concept, that obesity is protective for osteoporosis may not stand same as bone marrow fat deposition (adipogenesis) seen in obesity, is detrimental for bone health.

A systematic review was conducted by **Dijk et al (2014)** on the association between vasomotor symptoms and metabolic health in peri – and postmenopausal women. A systematic search of studies was performed in EMBASE, MEDLINE, Web-of-science, Scopus, PubMed publisher, Cochrane Library, Google scholar. Methodological quality was assessed using a modified NewCastle Ottawa Assessment Scale. After screening 2660 titles and abstracts, four studies, of which two cohort studies met the criteria of high methodological quality, were included in the review. However, both high-quality cohort studies, with large study populations and adjustment for multiple confounding variables showed positive associations between vasomotor symptoms and insulin resistance and type 2 diabetes mellitus. These findings suggest that there is an association between vasomotor symptoms and metabolic health outcomes.

A literature search on Age at Natural Menopause (ANM) by **Sapre and Thakur (2014)** was done using PubMed. The age at menopause depends on various factors like genetic, environmental, socioeconomic, reproductive, dietary, and lifestyle of which some lie nulliparity, vegetarian diet, smoking, high fat intake, cholesterol, and caffeine accelerates; while others like parity, prior use of contraceptive pills, and Japanese ethnicity delays the age at natural menopause. Age at natural menopause is an important risk factor for long term morbidity and mortality; and hence, the need to identify the modifiable risk factors like diet and lifestyle changes. Delayed menopause is associated with increased risk of endometrial and breast cancer, while early ANM enhances the risk for cardiovascular diseases and osteoporosis. The correlation between diet and ANM has not been extensively studied; however, whatever studies have been done till now point towards role of high intake of total calories, fruits and proteins in delaying the ANM, while high



polyunsaturated fat intake accelerates it. The role of dietary soy, total fat, saturated fat, red meat, and dietary fibre in determining the ANM has been controversial and needs further studies to substantiate it. The lifestyle factors like smoking and vigorous exercise have been significantly associated with early menopause, while moderate alcohol consumption delays the ANM.

**Panda et al (2013)** conducted a cross-sectional descriptive study in 173 women aged 31- 60 years with menopausal symptoms to correlate the serum follicle stimulating hormone (FSH) level with vaginal pH estimation. Vaginal pH was measured using pH micro-meter strips and serum FSH levels were measured using immuno assay methods. Results showed that mean FSH level was 46.5 IU/L and mean vaginal pH was 5.3. If the menopausal hallmark is considered to be vaginal pH >4.5 and serum FSH > 40IU/L, the sensitivity of vaginal pH for menopausal diagnosis is 84.9% and of serum FSH is 77.4%.

A descriptive study on menopausal depression was conducted by **Liji, Mathias (2011)**, which showed that out of 100 samples 9% of them had mild depression, 2% of them had moderate depression, 25.50 % reported climactic physiological factors, 20.29 % reported psychological factors and 14.20 % reported social factors.

A pre test – post test design was used to identify the knowledge of menopausal problems and their management of women aged 40-59 years in selected school teachers in Mangalore, the post-test knowledge score 25.13% was higher than mean pre test score (13.83%) the results showed that structured teaching programme has helped the teachers improve the knowledge by **Pinto (2011)**.

**Lim et al (2008)** studied on Vitamin D inadequacy in postmenopausal women in Eastern Asia. The objective of the study was to review data on the prevalence of vitamin D inadequacy and its causes in postmenopausal women. Data were obtained from the published biomedical literature as well as abstracts and posters presented at scientific meetings. Using MEDLINE, EMBASE and BIOSIS databases, epidemiological studies were identified. The prevalence of vitamin D inadequacy in studies of postmenopausal women (ambulatory or with osteoporosis or related musculoskeletal disorders) in Eastern Asia ranged from 0 to 92%, depending on the cut-off level of serum 25-hydroxycholecalciferol [25(OH)D] that was applied (range < or =6-35 ng/mL [ $< \text{ or } = 15\text{-}87 \text{ nmol/L}$ ]). Dietary deficiency and inadequate exposure or reactivity to sunlight (due to lifestyle choices, cultural customs and/or aging) were identified as important risk factors for vitamin D inadequacy.

### **Literature related to Menopause-Specific Quality Of Life Tool**

**Sydora et al (2016)** conducted a comprehensive scoping review to validate the tool such as Menopause-Specific Quality of Life (MENQOL) to measure condition-specific QOL in early postmenopausal women. The review was performed using 220 papers of various study designs conducted in 39 countries and using MENQOL translated into more than 25 languages. A variety of modifications were documented with omission or addition of items and alterations in MENQOL. However, this study found an extensive and steadily increasing use of MENQOL in clinical and epidemiological research. The study emphasised the importance of proper reporting and validation in translations and variations were required to ensure outcome comparison and precision of MENQOL's use.

## **Literature related to Pharmacological modalities for Menopausal Symptoms**

**Miller et al (2016)** carried out a study to assess the effect of abaloparatide vs placebo on new vertebral fractures in postmenopausal women with osteoporosis: a randomised clinical trial. The Abaloparatide Comparator Trial In Vertebral Endpoints (ACTIVE) was a phase 3, double-blind, RCT (March 2011-October 2014) at 28 sites in 10 countries. Postmenopausal women with bone mineral density (BMD) T score  $\leq -2.5$  and  $> -5.0$  at the lumbar spine or femoral neck and radiological evidence  $\geq 2$  mild or  $\geq 1$  moderate lumbar or thoracic vertebral fracture or history of low-trauma nonvertebral fracture within the past 5 years were eligible. Postmenopausal women ( $>65$  y) with fracture criteria and a T score  $\leq -2.0$  and  $> -5.0$  or without fracture criteria and a T score  $\leq -3.0$  and  $> -5.0$  could enroll. The results revealed that Kaplan-Meier estimated event rate for nonvertebral fracture was lower with abaloparatide vs placebo. BMD increases were greater with abaloparatide than placebo (all  $P < .001$ ). Among postmenopausal women with osteoporosis, the use of subcutaneous abaloparatide, compared with placebo, reduced the risk of new vertebral and nonvertebral fractures over 18 months.

**Moss et al (2016)** in their study explains that there are many issues surrounding an iatrogenic menopause in cervical cancer, a variety of potential management options and barriers to treatment. Women who have become menopausal under the age of 45 years as a result of cervical cancer are significantly less likely to start hormone replacement therapy (HRT) or continue it long term as compared with those who have undergone a surgical menopause for a benign reason. High profile media reports raising concerns about the safety of HRT use have left many women reluctant to consider HRT as a therapeutic option

for menopausal symptoms and many are seeking to use complementary/alternative medicine, including non-pharmacological interventions, to alleviate symptoms. The benefits of HRT in this population have been shown to reduce these effects, although adherence to treatment regimens is a challenge due to poor compliance, which is in part due to the fear of a second malignancy. The development of non-HRT-based interventions to ameliorate menopausal symptoms and reduce the long-term health consequences are needed for women who choose not to take HRT.

Systematic review evaluating the comparative effectiveness of treatments for menopausal symptoms, along with potential long-term benefits and harms of those treatments were done by **Grant et al (2015)**. The following electronic databases were searched through January 2014: MEDLINE, Embase, Cochrane Controlled Trials Register, and AMED Allied and Complementary Medicine. Gray literature searches included clinicaltrials.gov, the Food and Drug Administration Web site, and relevant conference abstracts. Menopausal symptom outcomes like vasomotor, quality of life, psychological, sexual function, urogenital, and sleep disturbances were reviewed. Systematic reviews, cohort studies, and case-control studies provided evidence for the following long-term benefits and harms: breast, colon, endometrial, and ovarian cancer; coronary heart disease and venous thromboembolic events; gallbladder disease; and osteoporotic fractures. Evidence from 283 trials provided results for vasomotor symptoms (211 trials), quality of life (125 trials), psychological symptoms (108 trials), sexual function (94 trials), urogenital atrophy (71 trials), and sleep disturbance (56 trials).

Nearly 32 percent of U.S. women aged 65 to 69 years have no teeth. Because some tooth loss may reflect systemic osteoporosis, and because estrogen therapy

seems to protect against osteoporosis, **Grodstein et al (2015)** examined the risk of tooth loss in relation to hormone use in a prospective study of 42,171 postmenopausal women. The risk of tooth loss was lower in women who currently used hormones. Although few studies have examined this issue, this research suggests that estrogen may reduce tooth loss.

A pilot study was conducted by **Agarwal, Singh, Kriplani, Bhatia and Singh (2015)** on safety and efficacy of gabapentin in management of psychosomatic and sexual symptoms in postmenopausal women. Fifty symptomatic postmenopausal females were randomly allocated into two groups; group I received gabapentin 900 mg/day along with calcium 500mg and Group II was given only calcium for 6 months and followed-up at 1,3, and 6 months. Data were analysed in terms of percentage reduction of psychosomatic and sexual symptoms. Change in lipid profile and other blood parameters by the end of study were measured. The results showed that there was maximum improvement in insomnia (90-98%) in gabapentin group. No significant improvement in vaginal dryness and dyspareunia were noted at all follow-ups in either group. Somatic symptoms reduced by 33, 36.8, and 40% at 1, 3 and 6 months, respectively, in group I compared to 18% improvement at all follow up in group II. Low density Lipo protein (LDL) was raised in group I significantly more than Group II. It was concluded that gabapentin could lead to improvement in postmenopausal psychosomatic symptoms, while sexual symptoms showed no improvement. Gabapentin can lead to increase in serum LDL, hence precaution should be taken in patients with deranged lipid profile.

A recent meta-analysis of epidemiological studies by **Baber (2015)** of the relationship between menopausal hormone therapy (MHT) and the risk of ovarian

cancer published in Lancet Oncology has reported an increased risk of epithelial ovarian cancer among the users of MHT compared with controls. Individual data sets from 52 epidemiological studies were identified and analysed centrally. Prospective and retrospective studies were examined separately. Considerations such as quality of life, protection against osteoporosis and cardiovascular disease, and risk of breast cancer far outweigh any risk of ovarian cancer and each individual woman should evaluate her own individual risk: benefit profile in consultation with her personal physician before deciding whether starting or continuing MHT, is the right choice for her.

A prospective observational randomised comparative study was undertaken by **Tandon, Sharma, Mahajan, Khajuria and Gillen (2014)** to evaluate the adherence / compliance rates of most commonly prescribed daily alendronate (ALN), weekly risedronate (RIS) and monthly ibandronate (IBN) BP regimens. Nearly 40% was the 1 year adherence rate with BP therapy and 41.33% of non – compliance. Whereas 8.66% was interrupted compliance rate and 6% switched over to other anti-osteoporotic treatment. The three treatment arm did not vary significantly. However, numerically maximum adherence rate of 56% was recorded in monthly BP regimen followed by weekly (36%) and daily regimen (32%). Medication possession rate confirmed on a follow up visit was maximum with monthly regimen as 84.61% followed by daily (62.5%) and weekly (61.11%) respectively. Average time in days for non-adherence was 48, 56 and 92 day with daily ALN, weekly RIS and monthly IBN regimen respectively. Age, mean age at menopause, demographical profile failed to influence the adherence. Concomitant treatment for co-morbid condition (57.14%), unawareness about osteoporosis (OP) (50%), cost of treatment (45.33%), belief that drugs are for their general disability ( 39.28%), physician's failure to stress the need

and necessary calcium + vitamin D daily requirement (23.80%) each were the most prevalent factors responsible for non-adherence. Intolerance and adverse drug reaction were responsible for only 13.09% and 11.90% of non-adherence.

**Farquhar et al (2012)** conducted a study to assess the effect of long-term Hormone Therapy on mortality, cardiovascular outcomes, cancer, gallbladder disease, cognition, fractures and quality of life for perimenopausal and postmenopausal women. Nineteen trials involving 41,904 women were included. In relatively healthy women, combined continuous HT significantly increased the risk of venous thrombo-embolism or coronary event (after one year's use), stroke (after three years), breast cancer and gallbladder disease. Long-term oestrogen-only HT significantly increased the risk of venous thrombo-embolism, stroke and gallbladder disease (after one to two years, three years and seven years' use respectively), but did not significantly increase the risk of breast cancer. The only statistically significant benefits of HT were a decreased incidence of fractures and (for combined HT) colon cancer, with long-term use. The only significantly increased risk reported was for venous thrombo-embolism in women taking combined continuous HT: their absolute risk remained low, at less than 1/500. However, this study was not powered to detect differences between groups of younger women.

### **Literature related to Non – Pharmacological modalities for Menopausal Symptoms**

**Franco et al (2016)** conducted a systematic review and meta-analysis to determine the association of plant-based therapies with menopausal symptoms. In total, 62 studies were identified, including 6653 individual women. Use of phytoestrogens was associated with a decrease in the number of daily hot flashes

(pooled mean difference of changes, -1.31 [95% CI, -2.02 to -0.61] and vaginal dryness score (pooled mean difference of changes, -0.31 [95% CI, -0.52 to -0.10] between the treatment groups but not in the number of night sweats (pooled mean difference of changes, -2.14 [95% CI, -5.57 to 1.29]). Individual phytoestrogen interventions such as dietary and supplemental soy isoflavones were associated with improvement in daily hot flashes (pooled mean difference of changes, -0.79 [-1.35 to -0.23]) and vaginal dryness score (pooled mean difference of changes, -0.26 [-0.48 to -0.04]). Several herbal remedies, were associated with an overall decrease in the frequency of vasomotor symptoms. There was substantial heterogeneity in quality across the available studies, and 46 (74%) of the included randomised clinical trials demonstrated a high risk of bias within 3 or more areas of study quality.

**Asghari, Mirghafourvand, Mohammad-Alizadeh-Charandabi, Malakouti and Nedjat (2016)** assessed the effect of exercise and nutrition education on quality of life and early menopausal symptoms. This trial was conducted in east Azerbaijan Province, Iran, during the period from 2013 to 2014 with 108 women allocated into one of four groups (n = 27 in each group) by block randomisation. The interventions received by the three intervention groups were: nutrition education, aerobic exercise, or exercise plus nutrition education. The control group did not receive any intervention. The Greene and MENQOL menopause symptom scales were completed before and at 8 and 12 weeks after the intervention. The mean Greene score was significantly lower than the control group in the exercise (adjusted mean difference: -5.1) and exercise plus nutrition groups (-8.0) at the end of week 8 and in the nutrition (-4.8), exercise (-8.7), and exercise plus nutrition (-13.2) groups at the end of week 12. Also, the mean MENQOL score was significantly lower than the



control group in the exercise (-8.3) and exercise plus nutrition groups (-13.8) at the end of week 8 and in the nutrition (-6.6), exercise (-13.5), and exercise plus nutrition (-22.1) groups at the end of week 12. Nutrition education with aerobic exercise can improve quality of life.

A multicentre randomised controlled trial by **Hunter, Hardy, Norton and Griffiths (2016)** was carried out on working women with menopausal symptoms. One hundred menopausal working women experiencing bothersome HFNS (Hot Flashes & Night Sweats) for two months were recruited from several organisations into this trial. These women were randomly assigned to either treatment (a self – help CBT intervention lasting 4 weeks) or to a no treatment-wait control condition (NTWC), following a screening interview, consent, and completion of a baseline questionnaire. The primary outcome is the rating of HFNS; secondary measures include HFNS frequency, mood, quality of life, attitudes to menopause, HFNS beliefs and behaviours, work absence and presenteeism, job satisfaction, job stress, job performance, disclosure to managers and turnover intention. Adherence, acceptability and feasibility were assessed at 20 weeks post-randomisation in questionnaires and qualitative interviews. Upon trial completion, the control group was offered the intervention.

A systematic review was undertaken by **Stefanopoulou and Grunfeld (2016)** on mind – body interventions for vasomotor symptoms in healthy menopausal women and breast cancer survivors. Mind-body therapies are commonly recommended to treat vasomotor symptoms, such as Hot Flashes and Night Sweats (HFNS). Outcome measures included HFNS frequency and/or severity or self-reported problem rating at post-treatment. The methodological quality of all studies was systematically assessed

using predefined criteria. Twenty-six RCTs met the inclusion criteria. Interventions included Yoga (n = 5), hypnosis (n = 3), mindfulness (n = 2), relaxation (n = 7), paced breathing (n = 4), reflexology (n = 1) and cognitive behavioural therapy (CBT) (n = 4). Findings were consistent for the effectiveness of CBT and relaxation therapies for alleviating troublesome vasomotor symptoms. Findings suggest that interventions that include breathing and relaxation techniques, as well as CBT, can be beneficial for alleviating vasomotor symptoms.

A systematic review was conducted by **Zheng, Lee & Chun in 2016** to measure osteoporotic bone loss in relation to Soy Isoflavones (SI) intake from diet or supplements. They reported that epidemiologic studies hold up the dietary SI intake decreases bone resorption and stimulates bone formation, in turn, reduces menopause-induced osteoporotic bone loss. But the other studies showed that bone site-specific trophic and synergistic effects combined with exercise intervention improves the bioavailability of SI or strengthen the bone-specific effects.

Systematic reviews were conducted by **Posadzki, AlBedah, Khalil and AlQaed (2016)** of complementary and alternative medicine for lowering blood lipid levels. Eight electronic databases were searched until March 2016. Additionally, all the retrieved references were inspected manually for further relevant papers. Twenty seven systematic reviews were included in the analyses. The majority of the SRs were of high methodological quality (mean Oxman score=4.81, SD=4.88; and the mean AMSTAR score=7.22, SD=3.38). The majority of SRs (56%) arrived at equivocal conclusions (of these 8 were of high quality); 7 SRs (37%) arrived at positive conclusions (of these 6 were of high quality), and 2 (7%) arrived at negative

conclusions (both were of high quality). There was conflicting evidence regarding the effectiveness of garlic; and promising evidence for Yoga.

**Vakili, Abedi, Afshari and Kaboli (2015)** studied the effect of mobile phone short messaging system on healthy food choices among Iranian postmenopausal women. This was a randomised controlled trial in which 100 postmenopausal women aged 40-60 years were recruited and assigned to two groups (50 each in the intervention and control groups). Food frequency consumption was measured using a questionnaire. A total of 16 text messages including information about modification of food selection (healthy choices, benefits, methods, etc.,) were sent to participants in the intervention group during 4 months follow-up (1/week). The Chi-square and independent *t*-test used for data analysis. Ninety-two women completed the study. The consumption of Vitamin A rich fruits and vegetables significantly increased in the intervention group compared to the control group ( $P < 0.001$ ). More women in the intervention group consumed fish after intervention ( $P = 0.02$ ). The consumption of green leafy vegetables showed a nonsignificant increase in the intervention group. It is concluded that using mobile phone short messaging system can improve the healthy food choices regarding Vitamin A rich fruits and vegetables and fish among postmenopausal women.

**(2014) Tandon, Sharma, Mahajan & Mahajan** conducted a randomised controlled 24 weeks study to evaluate the effect of life-style modification on postmenopausal overweight and obese Indian women in Government Medical College, Jammu, Jammu and Kashmir, India. Two groups were formed, Group I (n=30) was designated as Intervention (dietary and exercise group) and Group II(n=24) served as Control. Comparison of weight, waist circumference (WC) and body mass index

(BMI) were made among two groups at 4, 8, 16 and 24 weeks. At 8 weeks Group I caused a significant decrease in weight when compared with the control arm which continued throughout the study period ( $P < 0.05$ ) at both 16 and 24 weeks. Group I produced a significant reduction in waist circumference from 8 weeks onwards upto 24 weeks. BMI was statistically significant in Group I and the effect started at 4<sup>th</sup> week and the differences in BMI reduction were highly significant in 16<sup>th</sup> and 24<sup>th</sup> weeks. The results of this study strongly recommend the life-style management to be incorporated in daily routine of postmenopausal women under controlled supervision and motivation / adherence to lifestyle management shall go a long way to avoid dual menace of obesity and its related complications.

**Posadzki et al (2014)** conducted a systematic review of surveys on prevalence of Complementary and Alternative Medicine (CAM) use by menopausal women. The bibliographies of retrieved articles and relevant book chapters were also hand searched. 26 surveys were identified which included 32,465 menopausal women. Based on 6 surveys, 32.9% of women stated they were current/regular CAM users. Based on 9 surveys, 50.5% of women reported that they used CAM specifically for their menopausal symptoms. The most popular CAM modality was herbal medicine, followed by Yoga, soy/ phytoestrogens, evening primrose oil and relaxation. The available evidence suggests that the prevalence of CAM use is high.

A study was conducted by **Woods et al (2014)** on the effects of mind – body therapies on symptom clusters during the menopause transition. The aim was to review controlled clinical trials of mind-body therapies for hot flushes and at least one other co-occurring symptom from these groups: sleep, cognitive function, mood, and pain. 1193 abstracts were identified through extensive search of PubMed / Medline,

CINAHL Plus, PsycInfo, Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials, Web of Science, EMBASE, AMED, and Alt-Health Watch for randomised controlled trials. Results of the study revealed eight trials examining relaxation, Yoga, or exercise. Physical activity/exercise trials (six) yielded mixed results; only one significantly reduced hot flushes and mood symptoms. Of two relaxation therapy trials, only mindfulness-based stress reduction training reduced sleep and mood symptoms and had within-group treatment effects on hot flushes. Yoga (one trial) significantly reduced hot flushes and improved cognitive symptoms more than exercise, and also had within-group effects on sleep and pain symptoms.

**Peng et al (2014)** conducted a critical review of complementary and alternative medicine use in menopause focussing on prevalence, motivation, decision-making, and communication. A comprehensive search of 2002-2012 international literature in the Medline, CINAHL, AMED, and SCOPUS databases was conducted. The search was confined to peer-reviewed articles published in English with abstracts and reporting new empirical research findings regarding CAM use and menopause. The findings of this critical review provide insights for those practicing and managing health care in this area of women's health. Healthcare providers should prepare to inform menopausal women about all treatment options, including CAM, and should be aware of the possible adverse effects of CAM and potential interactions between CAM and conventional medicine among women in menopause who are under their care.

A quasi experimental study to evaluate the effectiveness of soya beans on somatic and vasomotor symptoms among menopausal women was carried out by

**Rukmani (2014).** Thirty samples were selected using snow ball sampling technique. 50 grams of baked soy beans were given to the menopausal women once a day for 30 days. Observation was made after 30 days of intervention by using Modified Greene Climacteric Menopausal Symptom Assessment tool. The pre-test and post-test scores depict that, in pre-test, majority (60%) of women had moderate symptoms, (40%) of women had severe symptoms whereas in post test all ( 100%) women had moderate symptoms and none had severe symptoms. Hence it seems that soya bean was effective in reducing the menopausal symptoms in post menopausal women.

**Nikpour and Haghani (2014)** studied the effect of exercise on quality of life in postmenopausal women referred to the bone densitometry centres of Iran University of medical sciences. This study was designed by a randomised – controlled trial. 80 volunteer postmenopausal women who experienced the menopause period naturally and have been taking hormone replacement treatment (HRT) were divided into two groups randomly (exercise group n = 40, control group n = 40). The Nottingham Health Profile (NHP) was used to assess quality of life in both groups before and after 8 weeks. The exercise group participated in an exercise programme which was composed of sub-maximal aerobic exercises for an 8-week period 5 times a week. Quality of life in two groups was compared at the end of 8 weeks. The results showed that there was a statistically significant difference in the exercise group for the NHP indicating an improvement in the quality of life ( $p < 0.05$ ). Thus, implementing appropriate educational programmes to promote the quality of life in postmenopausal women is recommended.

**Bemi, Venkatesan & Shobana (2013)** carried out a community based experimental study among 60 samples to assess the effectiveness of soya milk upon

menopausal symptoms among menopausal women in a selected suburb of Thiruverkadu Township. Survey method was used to assess the prevalence of menopause and following this the menopausal symptoms were assessed in control and experimental group using rating scale. The difference in mean and SD of physiological symptoms (M = 18.7, 14.4, S.D = 3.54, 4.66) and psychological symptoms ( M= 20.16, 13.56, S.D = 2.40, 4.81). The results revealed that there was a significant reduction in physiological and psychological symptoms in experimental group after four weeks of 100 ml of soya milk administration every day.

### **Literature related to Yoga and its effect on different conditions**

#### ***Literature related to Yoga and its effect on Low Back Pain***

**Saper et al in 2016** conducted a parallel randomised controlled trial to compare the effect of Yoga versus education in Veterans with chronic low back pain. The participants were randomised equally into a standardised weekly group Yoga class with home practice and education group provided a book with recommendations for 12 weeks. Low back pain intensity was measured by the Defense and Veterans Pain Rating Scale and back-related function using Roland Morris Disability Questionnaire. In the subsequent 12-weeks, Yoga participants were encouraged to continue home Yoga practice and education participants were continued to follow recommendations from the book. Qualitative interviews were conducted in Veterans in the Yoga group and their partners to explore the impact of chronic low back pain and Yoga on family relationships. It concluded that Yoga was an effective management for Veterans with chronic low back pain.

### *Literature related to Yoga and its effect on Stress and Concentration*

A pre-experimental study was conducted by **Gangadharan and Venkatesan (2016)** on the effect of Tratak Guided Meditation Technique upon stress and concentration level among late adolescent girls. The study employed one group pre and post test design. Non – probability purposive sampling technique was adopted. TGMT was performed everyday for 3 weeks. Findings of the study showed that majority of late adolescent girls (87%) experienced moderate stress and few of them experienced mild stress (13%). The level of stress in late adolescents was high before TGMT (M=12.4, SD=0.806) and after the TGMT it was found to be less (M=9.5, SD=0.695). The difference was statistically proven to be significant at  $p < 0.001$ . It can be interpreted that Tratak Guided Meditation Technique administered for 3 weeks showed markedly increased concentration levels and decreased stress levels. It was found that the participants were relaxed to plan their schedules clearly and prepare for examinations.

**Rani, Kumar and Sharma (2013)** carried out a pre experimental study on the effect of Yoga Nidra on stress level among first year B.Sc Nursing students. The objective was to assess and compare the stress level before and after administration of Yoga Nidra. The findings of the study revealed that mean stress score after Yoga Nidra (17.8) was lesser than the mean stress score before Yoga Nidra (28.82) as per t test ( $p < .05$ ). The students also reported that Yoga Nidra was useful, and they felt relaxed, peaceful and calm.

To examine the empirical evidence regarding the mechanisms through which Yoga reduces stress, **Riley and Park (2015)** conducted a systematic review of the literature, including any Yoga intervention that measured stress as a primary



dependent variable and tested a mechanism of the relationship with mediation. Their electronic database search yielded 926 abstracts, of which 71 were chosen for further inspection and 5 were selected for the final systematic review. These five studies examined three psychological mechanisms (positive affect, mindfulness and self-compassion) and four biological mechanisms (posterior hypothalamus, interleukin-6, C-reactive protein and cortisol). Positive affect, self-compassion, inhibition of the posterior hypothalamus and salivary cortisol were all shown to mediate the relationship between Yoga and stress.

### ***Literature related to Laughter Yoga for Hemodialysis patients***

A Pre – Post intervention feasibility study on Intra-dialytic Laughter Yoga therapy for haemodialysis patients was done by **Bennett et al (2015)**. It consists of physical exercise, relaxation techniques and simulated vigorous laughter. Eighteen participants were recruited into the study and Laughter Yoga therapists provided a four week intradialytic programme (30-min intervention three times per week). The results of the study showed that there were non-significant increases in happiness, mood, and optimism and a decrease in stress. Episodes of intradialytic hypotension decreased from 19 pre and 19 during Laughter Yoga to 4 post Laughter Yoga. There was no change in lung function or blood pressure. All nurses strongly agreed that Laughter Yoga had a positive impact on patients' mood. It was a feasible intervention and they would recommend Laughter Yoga to their patients. Hence it was concluded that Laughter Yoga is a safe, low-intensity form of intradialytic physical activity that can be successfully implemented for patients in dialysis settings.

### *Literature related to Yoga and its effect on Schizophrenia*

**Babu et al (2015)** conducted a study to determine the effectiveness of Yoga therapy for managing chronic schizophrenia patients in psychopathological aspects. By randomisation, 15 patients on each group were assigned as experimental group and control group. The interventional group received Yoga and pharmacotherapy whereas the control group received only pharmacotherapy. The study inferred that patients who underwent yogic intervention had better scores on Positive and Negative Syndrome Scale (PANSS).

### *Literature related to Yoga and its effect on Prenatal women*

**Kawanishi et al (2015)** systematically reviewed the literature to clarify the effects of prenatal Yoga in RCT focussing on the contents of the intervention, the intervention means, and the frequency of practice. The literature search was performed using the electronic database, PubMed. The inclusion criteria were RCT, pregnant women, and Yoga intervention. The study results showed that there were 54 citations; of these, eight studies (10 reports) were included in the final analysis. Regarding the contents of the intervention, while the two studies for depressed pregnant women only included physical postures, the remaining six studies also included breathing technique and meditation. Interventions were performed using lectures by instructors alone or together with self-teaching. The frequency of the intervention varied within each study. The findings suggest that prenatal Yoga may help reduce pelvic pain. It may also improve mental condition (stress, depression, anxiety, etc.), physical condition (pain and pleasure at the delivery, etc.), and perinatal outcomes (obstetrical complications, delivery time, etc.).

### *Literature related to Yoga and its effect on depression and anxiety in Post stroke disabled*

**Chan, Immink & Hillier (2012)** conducted a randomised, controlled pilot trial on Yoga and exercise for symptoms of depression and anxiety in people with post stroke disability at Royal Adelaide Hospital in South Australia. The participants were 14 individuals with chronic post stroke hemiparesis in which eight in the interventional group had 6-week standardised programme of Yoga-and-exercise and six in the control group received exercise-only for 6 weeks. The outcome was assessed by using self-reported symptoms of depression using the Geriatric Depression Scale (GDS15) and symptoms of anxiety and negative affect using the State Trait Anxiety Inventory (STAI). They reported that the interventional group had greater improvements without any adverse effects. In addition to that there was high compliance in the Yoga programme.

### **Literature related to Yoga and its effect on Menopausal Symptoms**

A randomised controlled trial conducted by **Jorge et al in 2016** to assess the effectiveness of Hatha Yoga practice on menopause symptoms and quality of life in post-menopausal women. Participants were randomly assigned to one of three groups such as control, exercise, and Yoga for a 12 week trial. The data were collected using Menopause Rating Scale, Lipp Stress Symptom Inventory, Bref World Health Organization Quality of Life, Beck Depression Inventory and State/Trait Anxiety Inventories and hormone levels. The results inferred lower scores for menopausal symptoms, stress levels and depression symptoms as well as significantly higher scores in quality of life in Hatha Yoga group when compared with the other two groups. The Yoga and exercise groups showed decreased levels of FSH and LH

whereas control group had increased cortisol level. Hence, it supported the evidence that Yoga practices could be considered as complementary therapy for improving psychological and physiological well being in post-menopausal women.

**Buchanan et al (2016)** studied the effects of Yoga and aerobic exercise on actigraphic sleep parameters in menopausal women with hot flashes. Finding Lasting Answers for Symptoms and Health (MsFLASH) network conducted the study among 186 late transition and postmenopausal women aged 40-62 years with hot flashes. Women were randomised to Yoga, supervised aerobic exercise, or usual activity. Changes in the actigraphic sleep outcomes from baseline to weeks 11-12 were small, and none differed between groups. In an exploratory analysis, women with baseline Pittsburgh Sleep Quality Index higher than 8 had significantly reduced TST-CV following Yoga compared with usual activity.

**Ruchi and Dangi (2015)** studied the effect of Yoga on menopausal symptoms in females in the post menopausal phase. Total Menopause Rating Scale (MRS) score with three subscale scores (somato-vegetative, psychological and urogenital) of MRS and Menopause Specific Quality of Life Questionnaire (MENQOL) score was measured on day 1 and day 30 in the study group which performed Yoga (Pranayama, Surya Namaskar and Savasana) under supervision for 4 weeks on every alternate day. The scores were compared with the control group that did not perform Yoga. Results showed that on day 1 the scores in both the groups were comparable. On day 30, the Yoga group showed a statistically significant reduction in the total MRS score, scores on all the 3 subscales of MRS as well as MENQOL score.

**Tikhe, Pailoor, Metri, Ganpat and Ramarao (2015)** assessed the effect of intensive Integrated Approach of Yoga Therapy (IAYT) on body fat and Body Mass

Index (BMI) and resting metabolism in mid-life overweight patients with T2DM (BMI, Mean  $\pm$  SD, 27.05  $\pm$  4.51). Twenty-four mid-life patients (6 females) with T2DM (Age, Mean  $\pm$  SD, 55.38  $\pm$  7.96 years) participated in the study and practiced IAYT for 7 days. The IAYT works at five layers of human existence (physical, vital, mental, intellectual and bliss) to bring positive health. The body fat and BMI and resting metabolism were recorded before and after IAYT using Karada Scan body composition monitor HBF-375 from Omron Healthcare Singapore PTE LTD. SPSS-16 was used to analyze the data. Shapiro-Wilk test showed that the data were not normally distributed. Further, the Wilcoxon signed-ranks test was used to analyse the change in means of pre- and post-measurements. Results showed that there was a significant decrease in body fat and BMI and resting metabolism ( $P < 0.001$ ). Hence the present study suggests that 7 days practice of IAYT has a great promise for the management of overweight in mid-life patients with T2DM.

**Jones et al (2015)** recruited women ( $n = 282$ ) from three American states for a clinical trial of Yoga, exercise, and omega-3 fatty acid supplements for VMS. To be eligible, women had to report at least 14 VMS per week, with some being moderate to severe. Sitting electrocardiograms were recorded for 15 min using Holter monitors at both baseline and 12-week follow-up. Time and frequency domain HRV measures were calculated. Women completed daily diary measures of VMS frequency and intensity for 2 weeks at baseline and for 1 week at the follow-up assessment 12 weeks later. Multivariable linear regression was used to assess the relationship between VMS and baseline HRV measures and to compare change in HRV with change in VMS over the 12 weeks. Results showed that HRV was not associated with either VMS frequency or intensity at baseline in perimenopausal and postmenopausal women experiencing high levels of VMS.

A prospective non-randomised control study was conducted by **Nayak, Kamath, Kumar and Rao (2014)** to assess the effect of Yoga therapy on physical and psychological quality of life of 216 perimenopausal women with 12 weeks of intervention. The subjects were divided into 2 groups with either Yoga therapy (n = 111) or exercise (n = 105) as the interventional tool. The symptoms control and QOL before and after intervention in both the groups were assessed by using the menopausal QOL questionnaire. The perimenopausal symptoms in all the four domains were improved by Yoga therapy, thus significantly improving the overall QOL compared to the control group. The study concluded that Yoga therapy is effective in managing the distressing perimenopausal symptoms. It is easy, safe, non – expensive alternative therapy helping the well-being of perimenopausal women and must be encouraged in the regular management of perimenopausal symptoms.

A pilot study of the effects of 10 weeks of Yoga practice on 11 midwife women's menopausal symptoms was conducted by **Taylor (2014)**. Qualitative analysis of participants' exit interviews provided information not captured in quantitative measures, including perceptions of the Yoga intervention and suggestions for improving the study protocol. The women reported feeling relaxed and physically better after Yoga class. Many viewed Yoga as a skill they could incorporate into daily life to reduce stress and manage menopausal symptoms.

**Reed et al (2013)** conducted a 12-week 3 × 2 randomised, controlled, factorial design trial of Yoga, Peri- and postmenopausal women, 40-62 years old, were assigned randomly to Yoga (n = 107), exercise (n = 106), or usual activity (n = 142) and also assigned randomly to a double-blind comparison of omega-3 (n = 177) or placebo (n = 178) capsules. The results of the study showed that for Yoga

compared to usual activity, baseline to 12-week improvements were seen for MENQOL total -0.3 (95% confidence interval, -0.6 to 0;  $P = .02$ ), vasomotor symptom domain ( $P = .02$ ), and sexuality domain ( $P = .03$ ) scores. For women who underwent exercise and omega-3 therapy compared with control subjects, improvements in baseline to 12-week total MENQOL scores were not observed. Exercise showed benefit in the MENQOL physical domain score at 12 weeks ( $P = .02$ ).

**Telang and Chakravarthy (2012)** conducted a study at the fertility research centre and Max Healthcare centre to evaluate the effect of Yoga on post menopausal women who practised regularly. There were 50 patients in each of 3 groups, (A,B,C – HRT, Calcium and Yoga) with a total of 150 patients. It was found that the bone mineral density was significantly higher in women in group C (Yoga) as compared to group A with a confidence interval of 99% and p value of 0.0023 and higher than group B with a confidential value of 99% and p value of 0.0009. Other symptoms also were significantly lesser in women who practice Yoga regularly. It was concluded by this study that Yoga scores over plain calcium supplements and HRT managing menopausal symptoms and preventing osteoporosis.

**Cramer, Lauche, Langhorst, Dobos (2012)** systematically reviewed and meta-analysed the effectiveness of Yoga for menopausal symptoms. Randomised controlled trials (RCTs) were included which assessed the effect of Yoga on major menopausal symptoms, namely, psychological symptoms, somatic symptoms, vasomotor symptoms, and urogenital symptoms. For each outcome, standardised mean differences (SMDs) and 95% confidence intervals (CIs) were calculated. Two authors independently assessed risk of bias using the risk of bias tool recommended

by the Cochrane Back Review Group. Five RCTs with 582 participants were included in the qualitative review, and 4 RCTs with 545 participants were included in the meta-analysis. There was moderate evidence for short-term effects on psychological symptoms (SMD = -0.37; 95% CI -0.67 to -0.07; P = 0.02). No evidence was found for total menopausal symptoms, somatic symptoms, vasomotor symptoms, or urogenital symptoms. Yoga was not associated with serious adverse events. It is concluded that this systematic review found moderate evidence for short-term effectiveness of Yoga for psychological symptoms in menopausal women.

The effect of Yoga on menopausal symptoms was studied by **Joshi et al (2011)** using a prospective, randomised, controlled and interventional study. Total Menopause Rating Scale (MRS) score and three subscale scores (somatovegetative, psychological and urogenital) were measured on day 1 and day 90 in the study group which performed Yoga (asana, pranayama and meditation) under supervision for three months, and were compared with the control group that did not perform Yoga. MRS has been designed to measure health-related quality of life of ageing women. It consists of 11 symptoms and three subscales. It was observed in the results that on day 1 the scores in both the groups were comparable. On day 90, the scores in the Yoga group showed a reduction in score on all the subscales, which was statistically significant. No significant difference was noted in the control group. Thus it is concluded that Yoga is effective in reducing menopausal symptoms and should be considered as alternative therapy for the management of menopausal symptoms.

**Cohen, Kanaya, Macer, Shen, Chang and Grady (2007)** studied the feasibility and acceptability of restorative Yoga for treatment of hot flushes. A pilot trial in 14 postmenopausal women experiencing 4 moderate to severe hot flushes per



day or 30 moderate to severe hot flushes per week. The intervention consisted of eight restorative Yoga poses. Efficacy measures included change in frequency and severity of hot flushes as recorded on a 7-day diary. Of those who completed the trial, 92% attended seven or more of the eight Yoga sessions. The majority of the subjects were satisfied with the study and 75% continued to practise Yoga 3 months after the study. Mean number of hot flushes per week decreased by 30.8% (95% CI 15.6-45.9%) and mean hot flush score decreased 34.2% (95% CI 16.0-52.5%) from baseline to week 8. No adverse events were observed. This pilot trial demonstrates that it is feasible to teach restorative Yoga to middle-aged women without prior Yoga experience. The high rates of subject retention and satisfaction suggest that Yoga is an acceptable intervention in this population.

### **Development of Nursing Evidence-Based Practice Protocol**

For the development of evidence based practice guideline, an extensive systematic review was carried out by the researcher. The electronic data bases and various hand search strategies were adopted for the systematic review. The search engines included were Pubmed Central, Google Scholar, Science Direct, Cochrane Library and Proquest. All the studies identified through this search were subjected to quality check by using Johns Hopkins evidence Practice Model. The researcher obtained permission from Johns Hopkins University (<https://www.ijhn-education.org>) to use the Johns Hopkins Nursing Evidence Based Practice (JHN EBP) model and tools. (Annexure K)

The Protocol includes the following aspects in this study :

1. Nursing Evidence Based Practice Question Development
2. PRISMA Flow Diagram

3. Characteristics of included papers (Study design wise and Intervention wise)
4. Individual Evidence Summary

## **1. Nursing Evidence Based Practice Question Development**

### **What is the problem and why is it important?**

This research focuses on somato-vegetative, psychological and urogenital symptoms experienced by the menopausal women. This research work was undertaken by the investigator to seek evidence as every menopausal woman subjectively have been facing one or the other menopausal symptoms

### **What is the current practice?**

At present, developed countries widely use hormone replacement therapies to manage the menopausal symptoms. The traditional practice in India among menopausal women is to accept the hormonal changes and symptoms in menopause as a part of ageing. Like developed countries the women in India too undergo stress, modification in lifestyle, family and work pressure. This makes them slowly move from conventional practices to modern medicine for speedy relief. It is seen that more and more women experience menopausal symptoms in varying degrees and seek the help of gynecologists / menopause practitioners.

### **What is the focus of the problem?**

The focus of the problem is both of clinical and educational concern. Menopausal symptoms are subjective and it differs from individuals. Those not able to manage visits the consultant, they are compared to above the water line of the

Iceberg. Not all of them with menopausal symptoms consult the physician or express their difficulty. Hence it is assumed that majority of them stay unidentified in the community i.e., below the waterline of the Iceberg. This majority ought to focus through educational / non pharmacological interventions.

### **How was the problem identified?**

The problem was identified by the researcher when midlife women constantly reported of ill health suggestive of menopausal and post menopausal symptoms.

### **What is the scope of the problem?**

In this research work the problem initially looks at the individual menopausal woman later shifting the scope on to the whole mass of post menopausal women with menopausal symptoms to generalise the evidence

### **What are the PICO Components?**

- **P** - Population / Patient. Here it is the women experiencing menopausal symptoms.
- **I** – Intervention. Here Yoga is the intervention planned.
- **C** – Comparison A comparison group is also identified who follows regular practices / routines without the given intervention.
- **O** – Outcome – The expected outcome is menopausal symptom reduction/ relief and is based on Yoga as an intervention measured using Menopause Rating Scale and Menopause Specific Quality of Life questionnaire thus increasing level of satisfaction on the Intervention and enhancing Quality of Life.

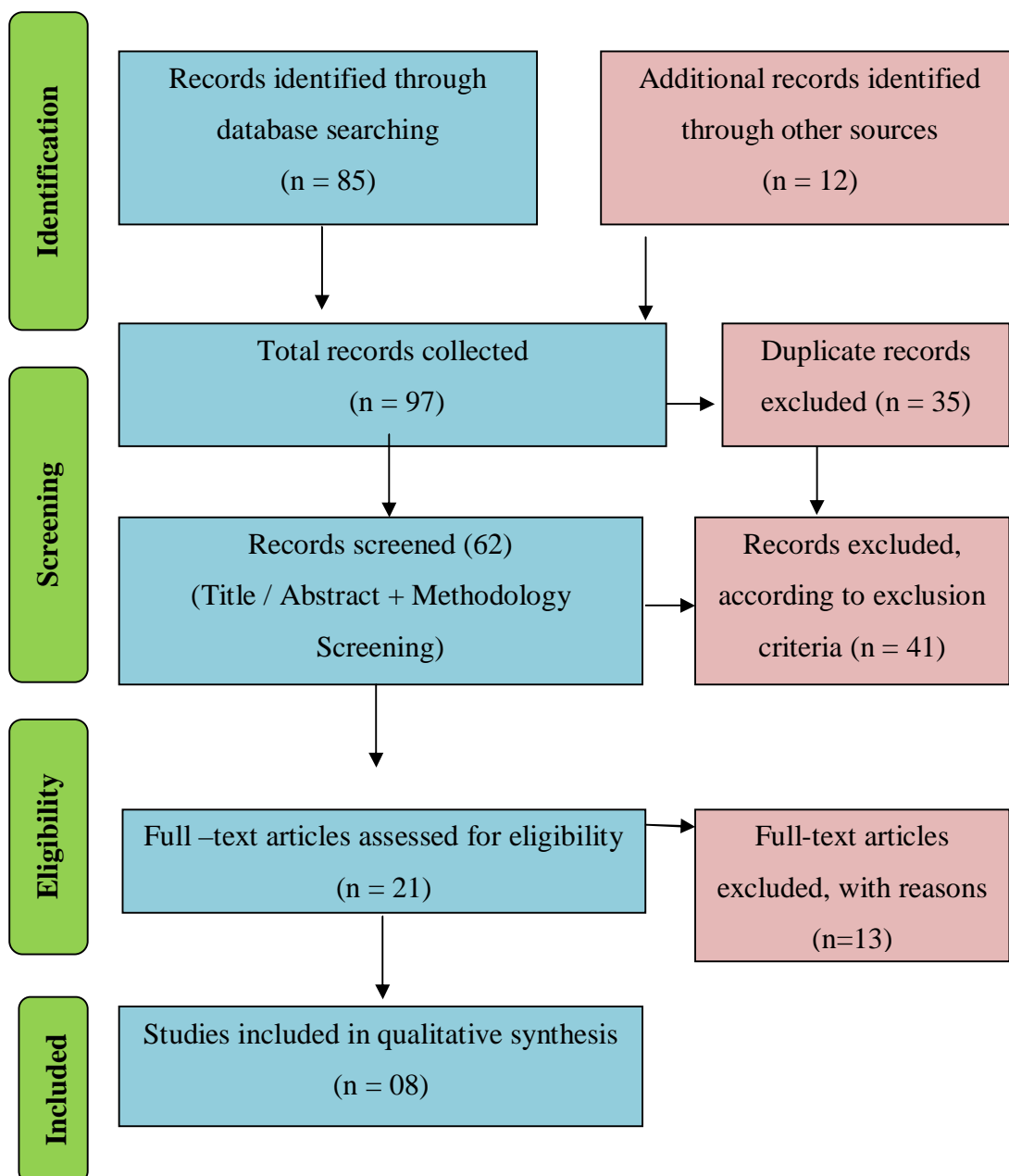
## 2. PRISMA Flow Diagram

**PRISMA (Preferred Reporting Items for Systematic Reviews and Meta – Analyses)** is an evidence based minimum set of items aimed at helping authors to report a wide array of systematic reviews and meta-analyses that assess the benefits and harms of a health care intervention. PRISMA focuses on ways in which authors can ensure a transparent and complete reporting of this type of research.

The two important components of PRISMA are The PRISMA checklist and The PRISMA flow diagram. In this research work, the researcher used the PRISMA flow diagram to depict the flow of information through the different phases of systematic review.

In this research work, PRISMA helped the author mainly focus and improve the reporting of systematic review of randomised controlled trials. It is further used as a basis for reporting reviews of other types of researches like cross sectional, cohort, case – control studies. Total records collected for the systematic review include 97 , out of which 85 were identified through database search and 12 were identified through other searches. Duplicate records were excluded at this stage were 35. The remaining records after undergoing screening for abstract and methodology were 62. Among these 62 , 41 were excluded based on the exclusion criteria. The remaining 21 full text articles were assessed for eligibility, out of which 13 full text articles were excluded with reasons. Hence there were 8 studies included for qualitative synthesis / metasynthesis.

### 3. PRISMA Flow Diagram depicting the different phases of Systematic Review



**Fig.3 PRISMA Flow Diagram**

#### 4. Characteristics of Included Papers in the Literature Review

**Table.1 Characteristics of Included Papers**

<b>I</b>	<b>Study design</b>	<b>Number of Articles, n= 62</b>	<b>%</b>
	Systematic Reviews	12	19.35
	Meta Analysis	1	1.61
	Critical Review	1	1.61
	Randomised controlled Trials	20	32.25
	Pilot Randomised Controlled Trials	3	4.83
	Non-randomised/pretest-post test/ Evaluative studies	3	4.83
		2	3.22
	Evaluation of Cohort Studies	2	3.22
	Cohort study (Prospective)	2	3.22
	Cohort Study (Retrospective)	1	1.61
	Prospective Case-control Study	1	1.61
	Longitudinal Analysis	2	3.22
	Descriptive / Descriptive correlational Studies	7	11.29
	Cross sectional Community based studies	1	1.61
	Case study	1	1.61
	Comprehensive Scoping Review	3	4.83
	Literature Search		
<b>II</b>	<b>Interventions</b>	<b>Number of Articles, n= 37</b>	<b>%</b>
	Yoga	18	48.64
	CAM	3	8.10
	Hormones	8	21.62
	Non-Hormonal drugs	1	2.70
	Soya supplements	3	8.10
	Cognitive Behavioural Therapy	2	5.40
	Nutrition education	2	5.40
	Exercise	2	5.40
	Relaxation	1	2.70
	Lifestyle modification	1	2.70

The included papers were classified based on the study design and based on the interventions. Based on the study design, there were totally 62 papers. Among these, there were 12 (19.35%) systematic reviews, 20 (32.25%) randomised controlled trials, 7 (11.29%) were cross sectional community based studies The remaining were meta- analysis, critical reviews, non randomised/ pretest post test / evaluation studies, cohort studies, case control study, case study, comprehensive scoping review and literature search.

Based on the interventions, there were totally 37 articles for menopausal symptoms. Among them 18 (48.64%) were Yoga as intervention, 8 (21.62%) were hormonal replacement therapy as intervention, 3 (8.10%) were CAM as intervention, 3 (8.10%) soya supplements. The other interventions were Cognitive Behavioural Therapy, relaxation, exercise, life style modification, nutrition education and non hormonal drugs.

**EBP Question: Is Yoga as an Intervention effective in treating menopausal symptoms**

**Table.2 Individual Evidence Summary of RCT's based on effectiveness of Yoga upon Menopausal Symptoms**

<b>Article No</b>	<b>Author &amp; Date</b>	<b>Title / Objective</b>	<b>Evidence Type</b>	<b>Sample, Sample Size, Setting and tool used</b>	<b>Study findings that help answer the EBP question</b>	<b>Evidence Level &amp; Quality</b>
1.	Jorge et al 2016	<b>Title</b> - Hatha Yoga practice decreases menopause symptoms and improves quality of life :A Randomised Controlled Trial <b>Objective</b> - to investigate the psychophysiological effects of Hatha Yoga regular practice in post-menopausal women.	Randomised Controlled Trial (RCT)	Sample - postmenopausal women Sample Size- 88 Tool used (Menopause Rating Scale), stress (Lipp Stress Symptom Inventory), quality of life (Brief World Health Organization Quality of Life), depression (Beck Depression Inventory) and anxiety (State/Trait	The results showed statistically lower scores for menopausal symptoms, stress levels and depression symptoms, as well as significantly higher scores in quality of life when compared to control and exercise groups. The Yoga and exercise groups showed decreased levels of FSH and LH whereas control group had increased cortisol levels. These results suggest that Yoga promotes positive psychophysiological changes in post-menopausal women and may be applied as a complementary therapy towards this population.	Level I



Article No	Author & Date	Title / Objective	Evidence Type	Sample, Sample Size, Setting and tool used	Study findings that help answer the EBP question	Evidence Level & Quality
				Anxiety Inventories). Physiological changes were evaluated through hormone levels (cortisol, FSH, LH, progesterone and estradiol).		
2.	Jones et al 2016	A Yoga & exercise randomized controlled trial for vasomotor symptoms : Effects on Heart Rate Variability	RCT	Perimenopausal and postmenopausal women, Sample size-335, 3 American states and Holter	Results showed that Heart Rate Variability was not associated with either vasomotor symptoms (VMS) frequency or intensity at baseline in perimenopausal and postmenopausal women experiencing high levels of VasoMotor Symptoms. Women had a median of 7.6 vasomotor symptoms per 24h. Time and frequency domain HRV measures did not change significantly in either of the intervention groups compared to the change in the usual activity group. HRV results did not differ when the analyses were	Level I

Article No	Author & Date	Title / Objective	Evidence Type	Sample, Sample Size, Setting and tool used	Study findings that help answer the EBP question	Evidence Level & Quality
					<p>restricted to post-menopausal women.</p> <p>Although Yoga and exercise have been shown to increase parasympathetic-mediated HRV in other populations, neither intervention increased HRV in middle-aged women with vasomotor symptoms. Mixed results in previous research may be due to sample differences. Yoga and exercise likely improve short-term health in middle-aged women through mechanisms other than HRV.</p>	
3.	Buchanan et al 2016	<p>Title- Effect of Yoga and aerobic exercise on actigraphic sleep parameters in menopausal women with hotflashes.</p> <p>Objectives - To determine effects of Yoga and aerobic exercise compared with usual activity on objective assessments</p>	RCT	<p>Late transition and post menopausal women, Sample size-186, Pittsburgh sleep quality Index</p>	<p>Baseline values of the primary sleep measures for the entire sample were mean total sleep time (TST) = 407.5 ± 56.7 min; mean wake after sleep onset (WASO) = 54.6 ± 21.8 min; mean CV for WASO = 37.7 ± 18.7 and mean CV for number of long awakenings &gt; 5 min = 81.5 ± 46.9. Changes in the actigraphic sleep outcomes from baseline to weeks 11-12 were small, and none differed between groups. In an exploratory analysis, women with baseline Pittsburgh Sleep Quality Index were higher than 8 had</p>	Level I

Article No	Author & Date	Title / Objective	Evidence Type	Sample, Sample Size, Setting and tool used	Study findings that help answer the EBP question	Evidence Level & Quality
		of sleep in midlife women.			significantly reduced TST-CV following Yoga compared with usual activity.	
4.	Chaturvedi, Nayak, Nayak & Rao 2016	<p><b>Title</b> - Comparative assessment of the effects of Hatha Yoga and Physical exercise on biochemical functions in perimenopausal women</p> <p><b>Objective</b> – to study the effect of Hatha Yoga therapy and regular physical exercise on FBS,GHB,TSH, serum cortisol &amp; total plasma thiol levels in perimenopausal women</p>	RCT	Post menopausal women. 216, FBS,GHB,TSH, serum cortisol & total plasma thiol levels	<p>FBS and GHB (<math>p \leq 0.05</math>) showed a significant decrease after Yoga therapy. Cortisol levels significantly (<math>p \leq 0.05</math>) increased in the post intervention period in the control group. However, it is maintained in the test group between the two time periods. The total plasma thiols level showed a rise in the post intervention period, significant rise (<math>p \leq 0.001</math>) in control group but not significant in the test group. The TSH levels were not altered in any group. It is concluded that exercise helps in maintaining the sugar levels but calming effects of Yoga practice is important in relieving stress and enhancing health in perimenopausal women</p>	Level I

Article No	Author & Date	Title / Objective	Evidence Type	Sample, Sample Size, Setting and tool used	Study findings that help answer the EBP question	Evidence Level & Quality
5.	Ruchi and Dangi 2015	Effect of Yoga on menopausal symptoms in females in the post menopausal phase	RCT	Menopause Rating Scale, Menopause Specific Quality of Life Questionnaire	Results showed that on day 1 the scores in both the groups were comparable. On day 30, the Yoga group showed a statistically significant reduction in the total MRS score, scores on all the 3 subscales of MRS as well as MENQOL score. No significant difference was noted in the control group. Yoga is effective in reducing menopausal symptoms and should be considered as alternative therapy for the management of menopausal symptoms.	Level I
6.	Afonso et al 2012	<b>Title-</b> Yoga decreases insomnia in postmenopausal women: a randomised clinical trial. <b>Objective</b> - to evaluate the effect of Yoga practice on the physical and mental health and climacteric symptoms of	RCT	Post menopausal women -50 – 65 years old, Sample size -44 Questionnaires on anxiety and depression scales, quality of life and climacteric symptoms	When compared with the control group, the Yoga group had significantly lower post treatment scores for climacteric symptoms and insomnia severity and higher scores for quality of life and resistance phase of stress. The reduction in insomnia severity in the Yoga group was significantly higher than that in the control and passive-stretching groups.  This study showed that a specific sequence of Yoga might be effective in	Level I

Article No	Author & Date	Title / Objective	Evidence Type	Sample, Sample Size, Setting and tool used	Study findings that help answer the EBP question	Evidence Level & Quality
		postmenopausal women with a diagnosis of insomnia.			reducing insomnia and menopausal symptoms as well as improving quality of life in post menopausal women with insomnia.	
7.	Telang and Chakravart hy 2012	To evaluate the effect of Yoga on post menopausal women who practiced regularly	RCT	Post menopausal women, 150 patients – 50 patients in each of three groups. Questionnaire on menstrual history, medical history, investigations like CBC, blood sugar, lipid profile, pap smear, pelvic exam, mammography & bone densitometry	<p>It was found that the bone mineral density was significantly higher in women in group C (Yoga) as compared to group A with a confidence interval of 99% and p value of 0.0023 and higher than group B with a confidential value of 99% and p value of 0.0009.</p> <p>The average BMD in the Yoga performing group was 1.0602 as compared to 0.9608 and 1.0503 in the non treatment and HRT groups. Other symptoms also were significantly lesser in women who practise Yoga regularly. It was concluded by this study that Yoga scores over plain calcium supplements and HRT in managing menopausal symptoms and preventing osteoporosis.</p>	Level I

Article No	Author & Date	Title / Objective	Evidence Type	Sample, Sample Size, Setting and tool used	Study findings that help answer the EBP question	Evidence Level & Quality
8.	Joshi et al 2011	Effect of Yoga on menopausal symptoms	Prospective Ransdomised Controlled & Interventional study	200 – study group -100 control group – 100 Tool used – Menopause rating Scale	<p>Total Menopause Rating Scale (MRS) score and three subscale scores (somatovegetative, psychological and urogenital) were measured on day 1 and day 90 in the study group which performed Yoga (asana, pranayam and meditation) under supervision for three months, and were compared with the control group that did not perform Yoga.</p> <p>It was observed in the results that on day 1 the scores in both the groups were comparable. On day 90, the scores in the Yoga group showed a reduction in score on all the subscales, which was statistically significant. No significant difference was noted in the control group. Thus it is concluded that Yoga is effective in reducing menopausal symptoms and should be considered as alternative therapy for the management of menopausal symptoms.</p>	Level I

## **Synthesis of Evidence**

There were eight evidences on the topic, found appropriate for Individual Evidence Summary and they were tabulated. All of the Evidences belonged to Level 1 which is coming under Evidence type, Randomised Controlled Trial.

## **Recommendations**

The Strength of overall Evidence suggests that Yoga is proven to be effective for managing menopausal symptoms in total and also domainwise. Yoga also scored better in the study by Telang and Chakravarthy 2012, when compared to calcium supplements and Hormone Replacement Therapy. A study by Afonso et al 2012 showed that a specific sequence of Yoga might be effective in reducing insomnia and menopausal symptoms as well as improving quality of life in post menopausal women with insomnia. (Joshi et al 2011) in their study stated that Yoga is effective in reducing menopausal symptoms and should be considered as alternative therapy for the management of menopausal symptoms. Jorge et al 2016 conducted a randomised control trial to investigate the psychophysiological effects of Hatha Yoga regular practice in post-menopausal women, the results suggest that Yoga promotes positive psychophysiological changes in post-menopausal women and may be applied as a complementary therapy towards this population.

Hence Yoga an alternative therapy is safe, free from untoward effects, could definitely be a choice for reducing menopausal symptoms and promoting quality of life. The consistent practice of it is suggestive of having an impact even on psychosocial domain of menopausal symptoms thus enhancing quality of life and well being. The types of evidences, their level and their findings selected in this study helped the researcher to proceed in the completion of the work.

## **Summary**

This chapter has dealt with the review of published research literature related to the problem stated. It has helped the researcher understand the impact of the problem under study. It has also enabled the investigator to design the study, develop the tool, plan for data collection procedure and analyse the collected data. This chapter has also dealt with Nursing evidence Based Practice Protocol which include NEBP question development, PRISMA flow diagram, the characteristics of included papers with regard to study design and interventions and Individual Evidence Summary of qualitative synthesis.



*Chapter III*  
*Research Methodology*

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## **CHAPTER – III**

### **RESEARCH METHODOLOGY**

The present study aimed at determining the effectiveness of Yoga upon menopausal symptoms in menopausal women and to find out how well Yoga as an intervention works. This chapter describes the aspects like research approach, research design, research setting, population, samples and sampling technique, sampling criteria, variables, selection and development of study instruments, psychometric properties of the instruments, data collection procedure, pilot study and data analysis.

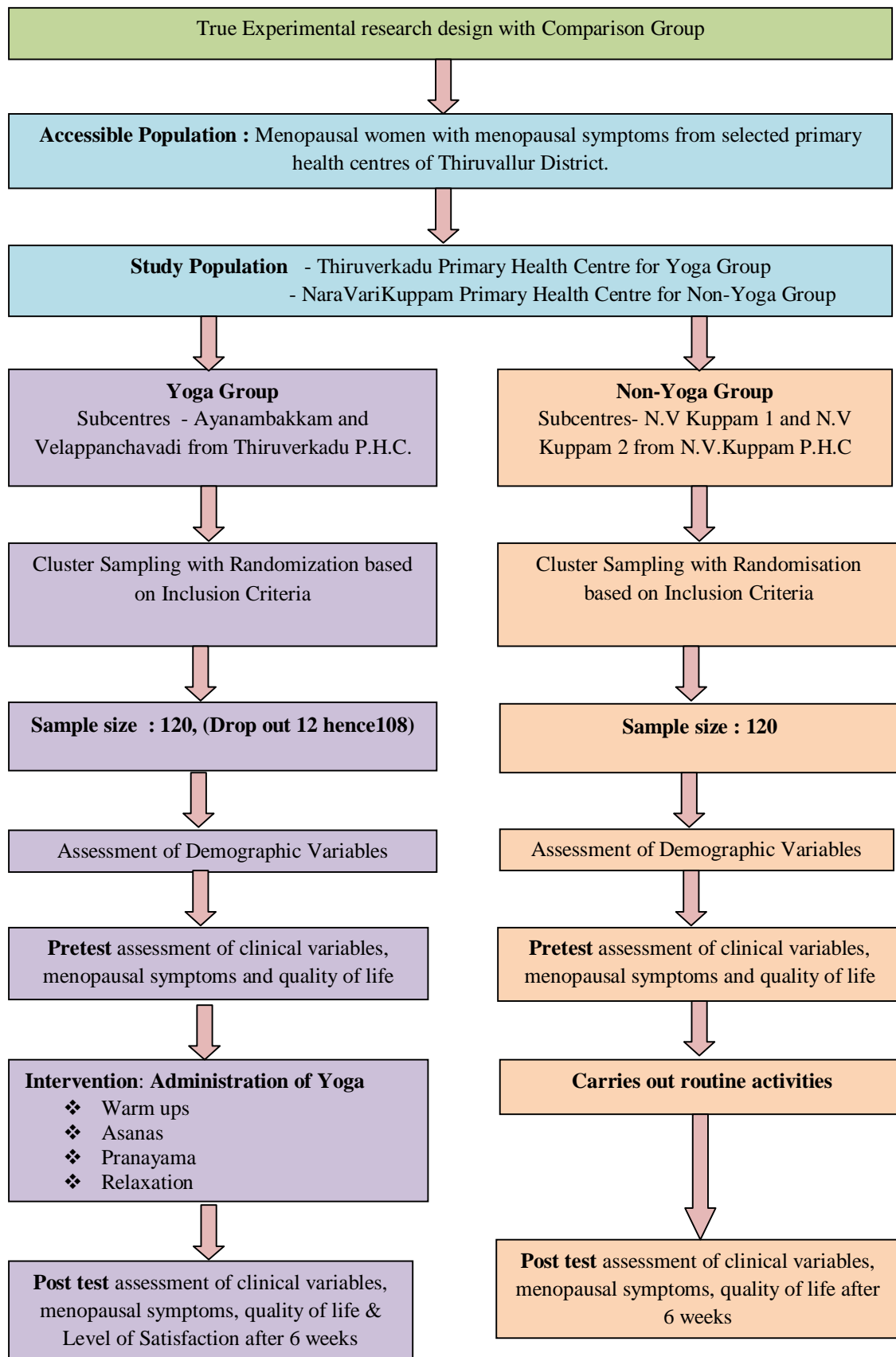
#### **Research Approach**

To accomplish the objective of this study, Quantitative experimental approach was considered most appropriate. The experimental research approach was selected for the present study as the study involved Yoga as intervention for menopausal women.

#### **Research Design**

According to Polit and Beck (2010) a research design is the overall plan for addressing a research question, including specification for enhancing the study integrity.

The controlled experiment is considered to be the gold standard for yielding reliable evidence about the cause and effect. Hence the Randomised Controlled Trial (RCT) a full experimental design to test a treatment involving random assignment to treatment group and control group was selected for the present study to determine the effect of Yoga upon menopausal symptoms in menopausal women.



**Fig.4 Schematic Representation of the Research Design**

A true experimental research design with comparison group is portrayed diagrammatically as follows:

<b>Yoga Group</b>	<b>R</b>	<b>O<sub>1</sub></b>	<b>X</b>	<b>O<sub>2</sub></b>
<b>Non-Yoga Group</b>	<b>R</b>	<b>O<sub>1</sub></b>	-	<b>O<sub>2</sub></b>

**R** - Random Assignment of the Postmenopausal women to both the groups.

**X** - Administration of Yoga as an Intervention.

**O<sub>1</sub>** - Pre-test assessment of clinical variables, menopausal symptoms using Menopause Rating Scale (MRS) & Menopause Specific Quality of Life Questionnaire (MENQOL).

**O<sub>2</sub>** - Post test assessment of clinical variables, menopausal symptoms using Menopause Rating Scale (MRS) & Menopause Specific Quality of Life Questionnaire (MENQOL) ) and Level of Satisfaction (only in Yoga group)

### **Variables**

#### **Independent Variable**

The independent variable of the present study is Administration of Yoga to the Postmenopausal women with menopausal symptoms. In this research Yoga is the variable that the researcher will manipulate to see if it makes the dependent variables change.

## **Dependent Variables**

Symptoms associated with menopause as measured by the Menopause Rating Scale, Quality of Life of postmenopausal women as measured by the Menopause Specific Quality of Life Questionnaire. Hence here the researcher has tried to measure the changes in the menopausal symptoms and quality of life.

## **Attribute Variables**

A variable that is a characteristic or trait of a subject which, therefore, researchers cannot manipulate but can only measure. The present study includes the demographic and the clinical variables as attribute variables which were measured by the researcher influence on menopausal symptoms of the postmenopausal women.

## **Research Setting**

The study was conducted in selected Sub Centres coming under two Primary Health Centres of Thiruvallur District namely Thiruverkadu PHC and Naravarikuppam PHC. The health care services to the population of this part of Thiruvallur District are provided by the Ministry of Health and Family Welfare through the sub centres and primary health centres. Hence Formal written permission was obtained from Directorate of Public Health and Deputy Director of Health Services, Thiruvallur District to conduct the study.

The total population in Thiruvallur District is 3,725,697 of which 34.70% (1,292,679) belongs to rural Thiruvallur and 65.30% (2433018) belong to urban Thiruvallur. The male population in the rural Thiruvallur is 647,183 to that of female population are 645,496. This study includes all the menopausal women belonging to 2 selected primary health centres in the rural Thiruvallur district. The Primary Health

Centres namely Naravarikuppam PHC for Non–Yoga group and Thiruverkadu PHC for Yoga group are selected conveniently.

Women in menopausal age are provided services from the Directorate of Public Health through Primary Health Centres and Sub centres. The services offered include screening for diabetes, hypertension, breast cancer and cervical cancer (VIA / VILI – visual inspection of cervix using acetic acid and lugol’s iodine). All these services were carried out earlier under Tamil Nadu Health Systems Project for the past six years. At present they are carried out under National Rural Health Mission in the NCD (Non-Communicable Disease) Clinics of the respective Primary Health Centres. The primary health centres also identify obese people by BMI calculation and manages through lifestyle modification. Additional services present now for midlifers are detection of changes in ECG, if changes prevail they will be referred to tertiary care facility. The NCD clinic is manned by registered nurses across state. It was observed that no specific interventions for menopausal women are implemented in the PHC.

### **Population**

**The target population** is the group of population that the researcher aims to study and to whom the study finding will be generalised. In this study, the target population will be all menopausal women to whom the study findings can be generalised to reduce the menopausal symptoms and improve their quality of life.

**Accessible population** is the list of population that the researcher finds in the study area. Thiruverkadu PHC comprises 4 subcentres namely Ayapakkam, Ayanambakkam, Veeraragavapuram and Velappanchavadi. Naravarikuppam PHC comprises 7 subcentres namely N.V.kuppam 1, N.V.Kuppam 2, N.V.Kuppam 3,

Puzhal 1, Puzhal 2, Puzhal 3 and Surapet. Thus from each PHC 2 subcentres were selected conveniently. Subcentres Ayanambakkam and Velappanchavadi from Thiruverkadu PHC for Yoga group and Subcentres N.V.Kuppam 1 and N.V.Kuppam 2 from Naravarikuppam PHC for Non Yoga group. In Yoga group, the female population of Ayanambakkam Sub centre is 6759 and Velappanchavadi Sub centre is 6843 and in Non-Yoga group, the female population of N.V Kuppam 1 sub centre is 3578 and N.V.Kuppam 2 sub centre is 6820. The researcher decided to recruit the post menopausal women with menopausal symptoms in this study. 23.4% of the female population in Tamil Nadu are between the age group 40 – 59 (National Family Health Survey).

### **Sample**

Sample consists of menopausal women with menopausal symptoms, who fulfil the inclusion criteria and are permanent residents of selected sub centres of Thiruverkadu PHC and N.V.Kuppam PHC in Thiruvallur District. The samples were selected through sampling process.

### **Sample Size**

Total sample size estimated was 240, out of which 120 samples were assigned to Yoga group and 120 samples to Non – Yoga group from selected sub centres of two selected Primary health centres. The sample size was estimated with the help of the On line Calculator based on the two scales namely Menopause Rating Scale (MRS) and Menopause Specific Quality of Life Questionnaire (MENQOL).

The sample size was estimated as follows: The following statistics were fed for the scales MRS and MENQOL. Since the two scales are used to ascertain the effect of Yoga. The MRS scale before and after Yoga intervention with a Standard

Deviation of 2.8 at  $\alpha = 0.05$  level of significance and  $\beta$  error = 0.20, the required samples are 62. The power of the study will be 80% ( $1 - 0.20 = 0.80$ ). The MENQOL scale of pre to post test after undergoing Yoga with a standard deviation of 4.8 at  $\alpha = 0.05$  level of significance and  $\beta$  error = 0.20, the required sample size is 181. The power of the study will be 80% ( $1 - 0.20 = 0.80$ ). By taking the average of the two samples, the size of the sample will be 122 and hence the recommended sample size was rounded off to 120 in Yoga and Non -Yoga group.

There were 12 drop outs in the Yoga group and hence the final sample size was 108 in Yoga group and the Non – Yoga group sample size remained the same as 120.

### **Sampling technique and Method of Sample Selection**

Sampling is the process of selecting a portion of the population to represent the entire population (Polit and Beck 2010). The study adopted cluster sampling technique with randomisation.

#### **Inclusion criteria**

The study includes only postmenopausal women

- Who had natural menopause
- With menopausal symptoms
- Above 40 years of age
- Who are willing to participate
- Who can understand Tamil and English

#### **Exclusion criteria**

The study excludes postmenopausal women

- With orthopaedic ailments
- With Cardiac problems



- With a history of using oral contraceptive pills & hormone replacement therapy
- Who are on antidepressants
- Who have weak abdominal musculature or hernia
- Who have attained premature or surgical menopause

### **Method of Sample Selection**

Two Sub centres were selected from the selected PHCs for Yoga and Non-Yoga group. Thiruverkadu PHC was selected conveniently for the Yoga group and the subcentres selected conveniently were Ayanambakkam and Velappanchavadi. Naravarikuppam PHC was selected conveniently for Non –Yoga group and the subcentres selected were N.V.Kuppam 1 and N.V.Kuppam 2 with 4 clusters in Yoga group and Non Yoga group respectively.

To achieve the required sample size of 120 in each PHC, Door to Door surveillance was done to recruit 60 menopausal women. 60 menopausal women with menopausal symptoms, who fulfilled the inclusion criteria were recruited from each cluster making a total of 240 in each PHC respectively. They were randomized using a random number table to achieve 30 samples in each cluster. Even numbers were included and odd numbers were excluded from the study. A sample size of 120 was achieved in both Yoga and Non-Yoga groups respectively. However in the Yoga group there were 12 drop outs and hence there were 108 menopausal women in the Yoga group and 120 menopausal women in the non-Yoga group.

## **Selection and Development of Study Instruments**

- Treece & Treece (1996) states that the instruments selected in a research should be the best to obtain data for drawing conclusions pertinent to the study. The instruments selected for use in the present study were:
- Demographic variable proforma
- Clinical variable proforma
- Standardised Menopause Rating Scale to assess the menopausal symptoms
- Standardised Menopause specific quality of life questionnaire
- Rating scale on level of satisfaction regarding Yoga.

### **Demographic Variable Proforma**

It was developed by the researcher to assess the following demographic characteristics: Age at Menopause, Age in Years, Duration of Menopause, Marital Status, Educational Status, Occupation, Nature of Work, Family monthly Income, Food Habits, Type of Family and Religion.

### **Clinical Variable Proforma**

Includes Height, Weight, Body Mass Index, pulse rate, Respiration, Systolic blood pressure, Diastolic Blood Pressure, Waist Circumference, Natural of Menstrual Cycle before Menopause, Breast Examination findings, Dietary history, Intake of Water in litres / day.

### **Standardised Menopause Rating Scale (MRS)**

The MRS scale is developed by Lother A.J. Heinnemann, Berlin Center for Epidemiology and Health Research. There are three domains / subscales included in

this scale. This standardised rating scale is a Likert scale with 11 Items and 5 Rating points meeting psychometric norms. They are Somato-vegetative domain - 4 items (1-3,11), Psychological domain - 4 items (4-7), and Urogenital domain – 3 items (8-10). Scoring is done according to the presence of Symptoms.

The author has made it free for those who are interested, in using the scale in their research to download and use it without any formal permission from their website. It is made free for non funded academic users. (Annexure – M)

**Scoring key - None** – 0, Mild – 1, Moderate – 2, Severe – 3, Very Severe – 4

### **Standardised Menopause Specific Quality of Life Questionnaire (MENQOL)**

The menopause specific quality of life (MENQOL) questionnaire developed by Hilditch et al., a standardised and specific tool to measure the health related quality of life in menopausal women. It has been translated into about 15 languages including and is used widely. The author has made the tool free to access for non funded academic researches with no royalty / distribution fees. (Annexure – L)

The domains are: Vasomotor - 3 items (1-3), Psychosocial -7 items (4-10), Physical -15 (11-25) and sexual -2 items (26 and 27). According to the presence of symptoms scoring will be done. For completing the questionnaire, if the woman has not the symptom, she ticks “no “and if she has the symptom she indicates how bothered she is from the symptom in scoring 0-6. For analyses, the item scores were converted to the score ranging from 1 to 8 in the following manner:

The questionnaire score becomes “1” for “no,” “2” for “yes,” “not bothered” through to “8” for “yes,” “extremely bothered.”

### **Scoring Key**

No Symptoms – 1, Having symptoms (not at all bothered) (0 -4) – 2-6, Having Symptoms (Extremely bothered) (5,6) – 7,8

**Rating Scale on level of Satisfaction** - This rating scale was designed by the researcher to assess the level of satisfaction of menopausal women with menopausal symptoms regarding Yoga and this was assessed by the researcher after Yoga intervention.

### **Score**

Highly satisfied - 4, Satisfied -3, Dissatisfied -2, highly dissatisfied -1

### **Psychometric properties of the instruments**

#### **Validity**

Tools were constructed by the researcher to assess the demographic variables, clinical variables and level of satisfaction of the menopausal women. Standardised tools like Menopause Rating Scale and Menopause Specific Quality of Life Questionnaire were also used in this study. The constructed tools were given to experts for content validity. Opinions and suggestions were obtained from the experts in the field of community medicine, community health nursing, gynecology, obstetrics and gynaecological nursing, Yoga, psychiatric mental health nursing and biostatistics.

#### **Reliability**

Reliability is concerned with how consistently and accurately the measurement technique measured the concept of interest (Burns & Grove, 1999). In this study all the tools including the standardised tools were pre tested, and translated

into Tamil using forward backward translation. Reliability of Menopause Rating Scale by the author Lother .A.J.Heinemann for overall symptoms is 0.80 and for sub domains are somatic – 0.73, psychological – 0.80 and urogenital 0.82 respectively. Reliability analysis was performed on the modified Menopause Rating Scale questionnaire with Cronbach’s alpha which was overall 0.81, and domain wise in somatic subscale 0.712, psychological subscale 0.743 and urogenital subscale 0.821 respectively. The reliability of Menopause specific quality of life questionnaire developed by Hilditch et al was 0.75 and reliability analysis performed by researcher was 0.72.

The forward-backward procedure was applied to translate the questionnaires. The questionnaires were first translated into Tamil language by the researcher and language experts ensured the correct translation, and then translated back to English to validate whether the original meaning of the questionnaire was maintained in the translation; a pilot study was done on 60 women to validate the translated MRS questionnaires. However it was noted from the pilot study, these women had difficulties in rating the scale themselves, in order to minimise these difficulties, a face-to-face interview was done rather than using self-administered response.

### **Ethical Considerations / Protection of Human Rights**

The study was conducted after obtaining the grant of ethical approval and clearance from Institutional Ethics Committee, Apollo Hospitals, Chennai (Annexure-D). Formal written Permission was obtained from the Office of Directorate of Public Health, Chennai and Deputy Director of Health Services, Thiruvallur District to utilise the Subcentres under the PHC Thiruverkadu and Naravarikuppam (Annexure – I, J)). The copies of the letters were submitted to the Medical Officers of the

concerned PHCs. Informed consent was obtained from all the participants before the data collection (Annexure - P).

### **Intervention Protocol**

The Yoga therapy module is developed by the researcher on the basis of Patanjali and Hatha Yoga to address the menopausal symptoms with suitable practice of

1. Warm ups ( Hand and Leg stretches)
2. Asanas (Body Postures) : Includes Ardha Kadichakrasana, Pada Hastha Asana Udhana Pada Asana, Pavanamuktasana, Makara Asana, Bujangasana, Salabasana, Janusirasana, Balasana, Utiana Bandha
3. Cool Down Asanas : Pranayama - Nadi Shudhi (alternate nostril) and Sheethali through tongue), Dhyana (concentrates breath in meditative pose in Ardha Padmasana or Sukhasana) and Shanthiasana (deep relaxation in corpse pose). (Annexure - R)

The Yoga practices were demonstrated by the researcher and the subjects were expected to perform and practice the same in front of the researcher. The intervention was planned for 6weeks which began by collecting the baseline data, teaching and practising respective protocol for 60 minutes every day for 6 days in a week. The follow ups and post interventional data were assessed after 6 weeks of practice. The study included 228 post menopausal women, 108 in Yoga group and 120 in Non - Yoga group from the selected Primary Health Centres. Formal permission for utilisation of the population under the selected Primary Health Centres were obtained from the DDHS, Thiruvallur District. The samples were chosen by cluster sampling technique with randomization. Every group in a cluster contained not more than 15

participants. The permission for the space chosen was obtained from the local leaders concerned/ influential persons and the owners of the space.

The researcher got training in Yoga by qualifying Postgraduate Diploma in Yoga and Naturopathy under Tamil Nadu Physical Education and Sports University. (Annexure-H).

### **Pilot Study**

Polit and Beck (2010) is a small scale version done in preparation for the original research work. The purpose is to find out the feasibility and practicality of the main study.

A Pilot study was conducted among 24 samples, 12 each in Yoga and Non – Yoga group who met the inclusion criteria. The study was feasible to conduct. Tools were found to be relevant and feasible to use. There were no confusion, duplication or ambiguity in any questions or tools. The overall study was found to be feasible. The only problem faced was Menopausal women were finding it difficult to rate the scale themselves as it was self administered. Hence they were interviewed face to face.

### **Data Collection Procedure**

The data were collected from menopausal women between June 2015 and July 2016. With the support of women self-help group, local leaders, respective ward councillors and the village health nurses the researcher further proceeded with the data collection. The data were first collected for the control (Non Yoga) group and then for the experimental (Yoga) group. The data were collected in three phases.

In Phase I, Informed and written consent were taken from the study participants, the baseline data of demographic variables, clinical variables, level of

menopausal symptoms and quality of life were assessed before the intervention in both Yoga and Non-Yoga group.

In Phase II, Yoga intervention was administered to experimental group by the researcher followed by which the subjects performed the Yoga techniques for a period of 6 weeks.

In Phase III, the post test clinical variables, level of menopausal symptoms, and level of satisfaction were assessed after the intervention for both the Yoga and Non-Yoga group of menopausal women. The menopausal women in the Non-Yoga group will not be receiving any intervention and will be carrying out routine activities.

### **Problems faced during data collection**

The problems faced during data collection and intervention include utilisation of long time to conduct interview, including waiting time to collect participants for intervention. Initially the researcher found it not easy to gather the required participants to one place at a time as some of the them showed reluctance which slowly disappeared as they got geared up later and showed interest in performing Yoga. Although there were twelve dropouts in Yoga group of menopausal women.

### **Summary**

This chapter deals with the research methodology of the study. It included research approach, design, variables, study setting, population, sampling process, development/ selection of tools, description of tools, ethical consideration, data collection procedure, data analysis methods and summary.

The next chapter deals with the statistical analysis of data and the interpretation of results.



*Chapter IV*  
*Analysis and Interpretation*

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## CHAPTER IV

### DATA ANALYSIS AND INTERPRETATION

This chapter deals with analysis and interpretation including both descriptive and inferential statistics. The data were collected from post menopausal women with menopausal symptoms at selected sub centres of Thiruverkadu and Naravarikuppam primary health centres belonging to Thiruvallur district with 108 in the Yoga (experimental) group and 120 in the Non-Yoga (control) group. The data were analysed according to the objectives and hypothesis of the study. Analysis of the study was compiled after all the data were transferred to the master coding sheet.

Data were entered and analysed using SPSS-20 package. Appropriate statistical methods were used based on the objectives of the study. Descriptive Statistics used were Frequency, Percentage, Mean and Standard deviation. The continuous variables were interpreted by appropriate parametric tests and the categorical variables were interpreted by appropriate non parametric tests.

In this study the parametric tests such as Student “t” test viz. Paired and Unpaired were applied. The non parametric  $\chi^2$  (Chi-squared) tests were utilised. The relationship between the menopausal symptoms and quality of Life were studied by Karl Pearson product moment correlation and regression. Non parametric tests chi square was used to analyse the association between selected demographic variables and clinical variables with the pretest and post test level of menopausal symptoms and quality of life respectively.

## **Organisation of Study Findings :**

The substantive summary of the data analysed is organised under the following sections.

**Section 1:** Description of Demographic and Clinical Variables of Yoga and Non – Yoga groups of Menopausal women with regard to Homogeneity

**Section 2:** Pre and Post test Assessments of Clinical Variables, Menopausal Symptoms and Menopause Specific Quality of Life in Yoga and Non – Yoga groups of Menopausal women

**Section 3 :** Mean, Standard Deviation and t value showing the Effectiveness of Yoga in Controlling Clinical Variables, Menopausal Symptoms and improving Menopause Specific Quality of Life within and between groups among Yoga and Non –Yoga groups of Menopausal women

**Section 4 :** Assessment of Levels of Satisfaction on Yoga Intervention among Yoga group of Menopausal Women

**Section 5:** Assessment of Correlation between Menopausal Symptoms and Menopause Specific Quality of Life in pre and post tests among Yoga and Non-Yoga groups of Menopausal women

**Section 6 :** Association between Demographic Variable and Clinical Variables with their Menopausal Symptoms and quality of Life in Yoga and Non –Yoga groups of Menopausal women in the pretest and post test

**Section 7 :** Regression Analysis of associated variables with Menopausal Symptoms (MRS) and Menopause Specific Quality of Life among Yoga and Non-Yoga groups of Menopausal women

**Section 1: Description of Demographic and Clinical Variables of Yoga and Non – Yoga group with regard to Homogeneity**

**Table. 3 Frequency, Percentage and Chi square values of demographic variables (categorical) among the Yoga and Non-Yoga group of Menopausal women for homogeneity.**

Demographic Variables	Components	Yoga group (n=108)		Non-Yoga group (n=120)		$\chi^2$	df	Sig
		f	%	f	%			
		<b>Educational status</b>	Illiterate	29	26.9			
Primary & High School	48		44.4	49	40.8			
Hr. Secondary	19		17.6	27	22.5			
UG and PG	12		11.1	14	11.7			
Home maker	84		77.8	93	77.5			
<b>Occupation</b>	Self Employed	13	12.0	12	10.0	0.592	3	P>0.05
	Employed	10	9.3	13	10.8			
	Others	1	0.9	2	1.7			
<b>Nature of Work</b>	Sedentary	40	37.0	39	32.5	0.533	3	P>0.05
	Moderate	56	51.9	67	55.9			
	Heavy	11	10.2	13	10.8			
	Others	1	0.9	1	0.8			

<b>Family monthly Income in Rs</b>	<5000	6	5.6	4	3.3	2.472	3	P>0.05
	5000-10000	22	20.4	32	26.7			
	10000-15000	29	26.9	36	30.0			
	Above 15000	51	47.2	48	40.0			
<b>Food habits</b>	Vegetarian	24	22.2	28	23.3	1.110	2	P>0.05
	Ova vegetarian	4	3.7	8	6.7			
	Mixed diet	80	74.1	84	70.0			
<b>Religion</b>	Hindu	92	85.2	89	74.2	5.899	2	P>0.05
	Christian	15	13.9	31	25.8			
	Muslim	1	0.9	0	0.0			

The data presented in Table 3, fig.5 & 6 show that majority of the menopausal women (85.2%, 85.8%) were married and living with spouse, educated upto primary & high school (44.4%, 40.8%), homemakers (77.8%,77.5%), moderate workers (51.9%, 55.9%), having family monthly income of < 15,000 (47.2%, 40%), consuming mixed diet ( 74.1% ,70.0% ), living in nuclear family (75.9%, 83.3%) & Hindus (85.2%,74.2%) in Yoga and Non-Yoga group respectively. There was no statistically significant difference (P>0.05) between the groups. Hence they are comparable and homogenous groups.

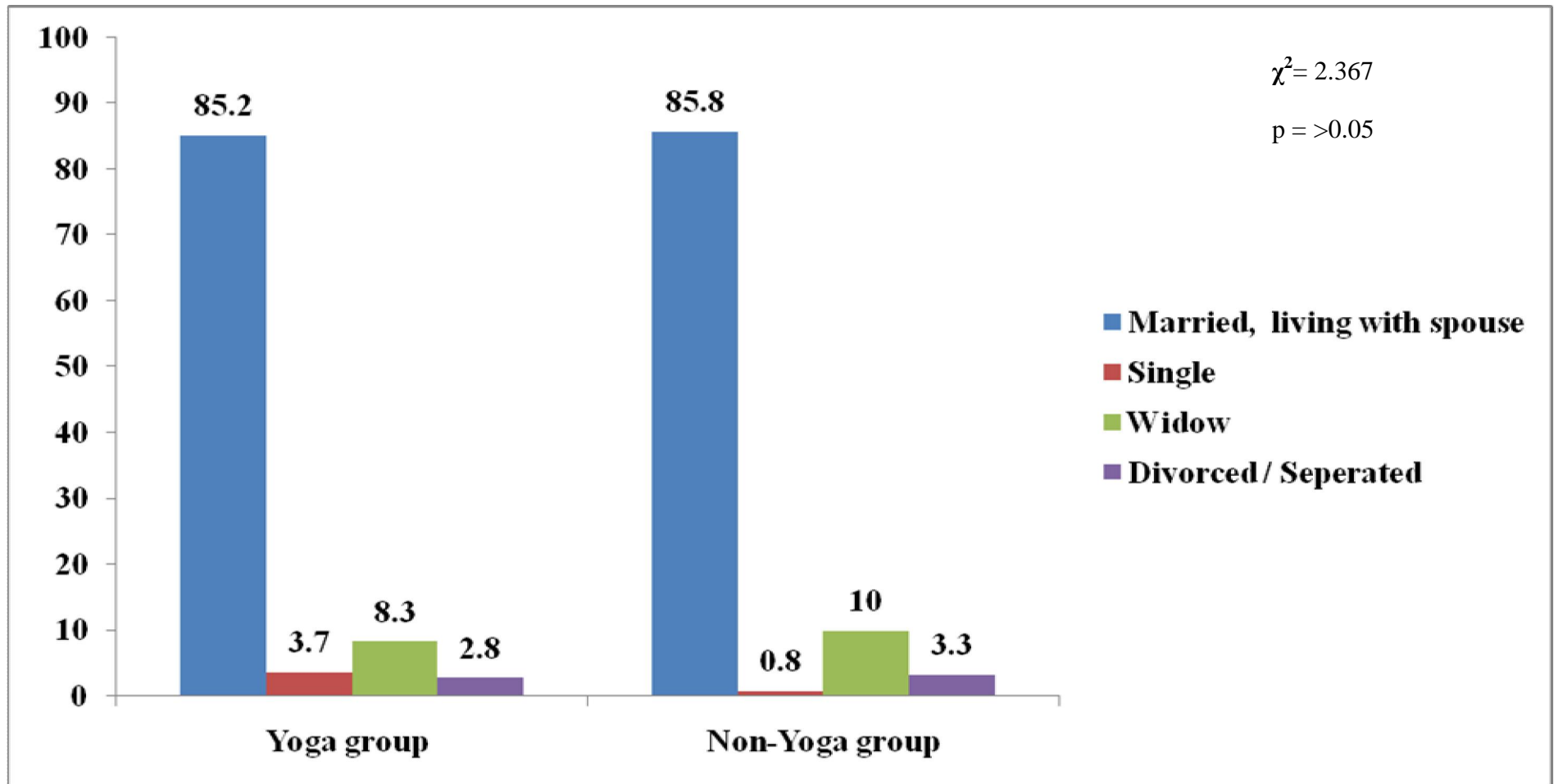
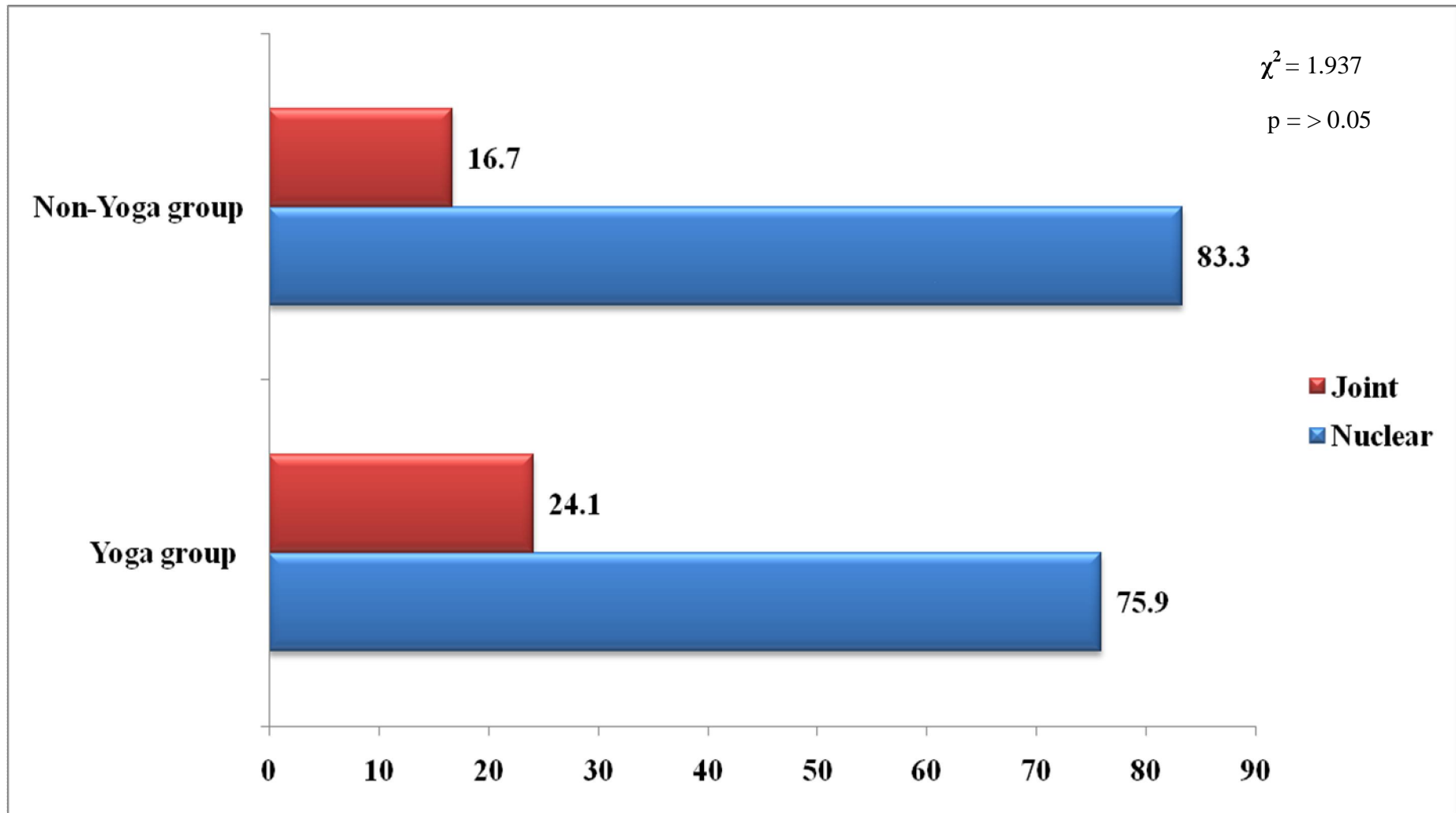


Fig. 5 Percentage Distribution of Marital Status of Menopausal Women



**Fig. 6 Percentage Distribution of Family Type of Menopausal Women**

**Table. 4 Mean, Standard deviation & ‘t’ value of age related demographic variables (continuous) among the Yoga and Non-Yoga group of Menopausal women for homogeneity.**

Demographic Variables (continuous)	Yoga Group (n=108)		Non-Yoga Group (n=120)		“t”	df	Sig.
	Mean	SD	Mean	SD			
	<b>Age at Natural Menopause</b>	46.9	4.0	47.0			
<b>Current age</b>	52.9	6.3	52.8	6.2	0.087	226	P>0.05
<b>Duration of Menopause (in years)</b>	6.1	5.2	5.9	5.0	0.199	226	P>0.05

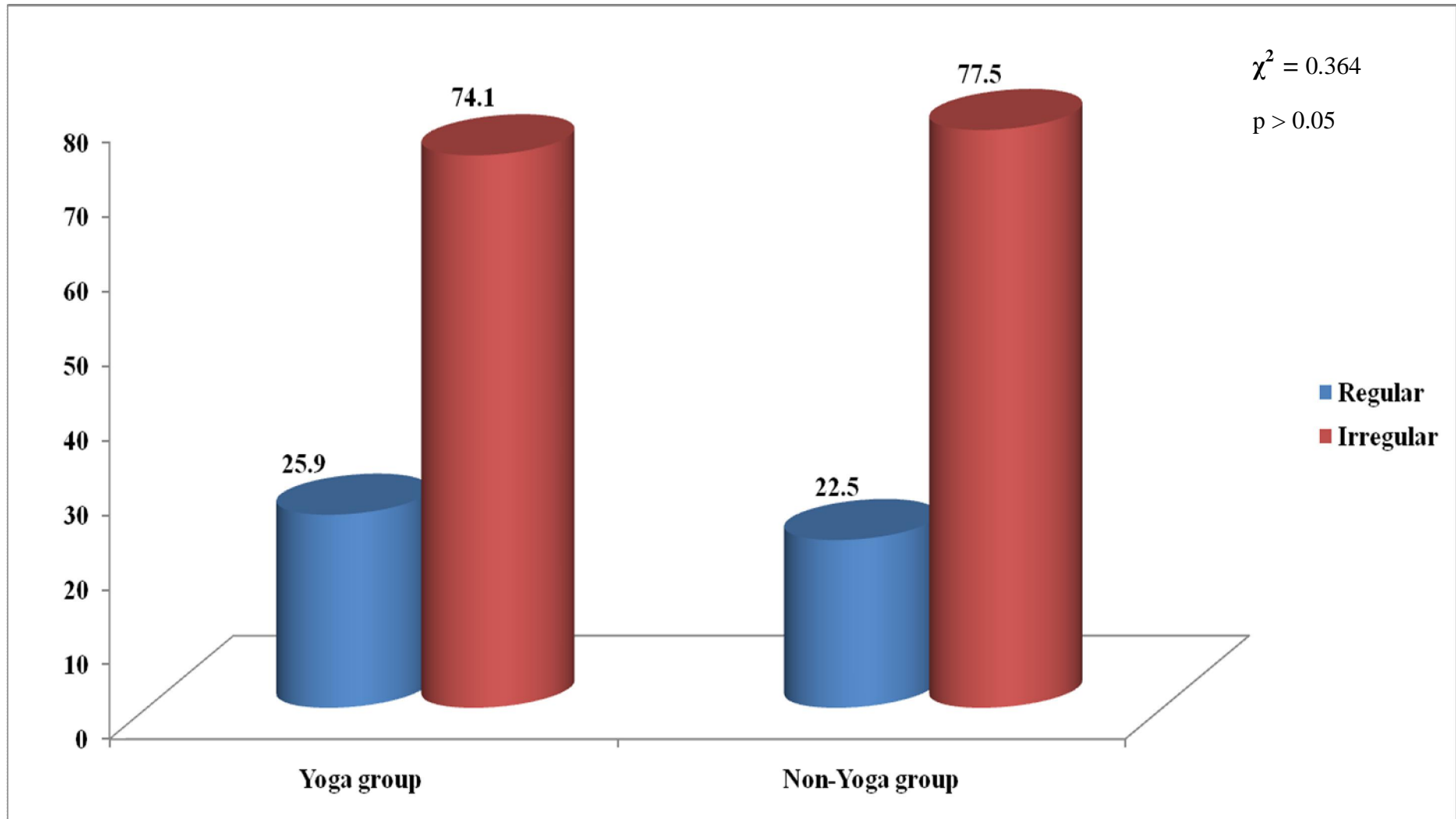
It can be noted from Table 4 that the mean age at natural menopause was  $46.9 \pm 4.0$  years and  $47.0 \pm 3.5$  years in Yoga and Non-Yoga group respectively. The difference between them was not statistically significant ( $P > 0.05$ ). Similarly, the mean current age ( $52.9 \pm 6.3$  and  $52.8 \pm 6.2$ ) and duration of menopause ( $6.1 \pm 5.2$  and  $5.9 \pm 5$ ) were also not statistically significant ( $P > 0.05$ ). Hence it can be inferred from the above table that the two groups were comparable and homogenous in respect of their age related demographic variables.



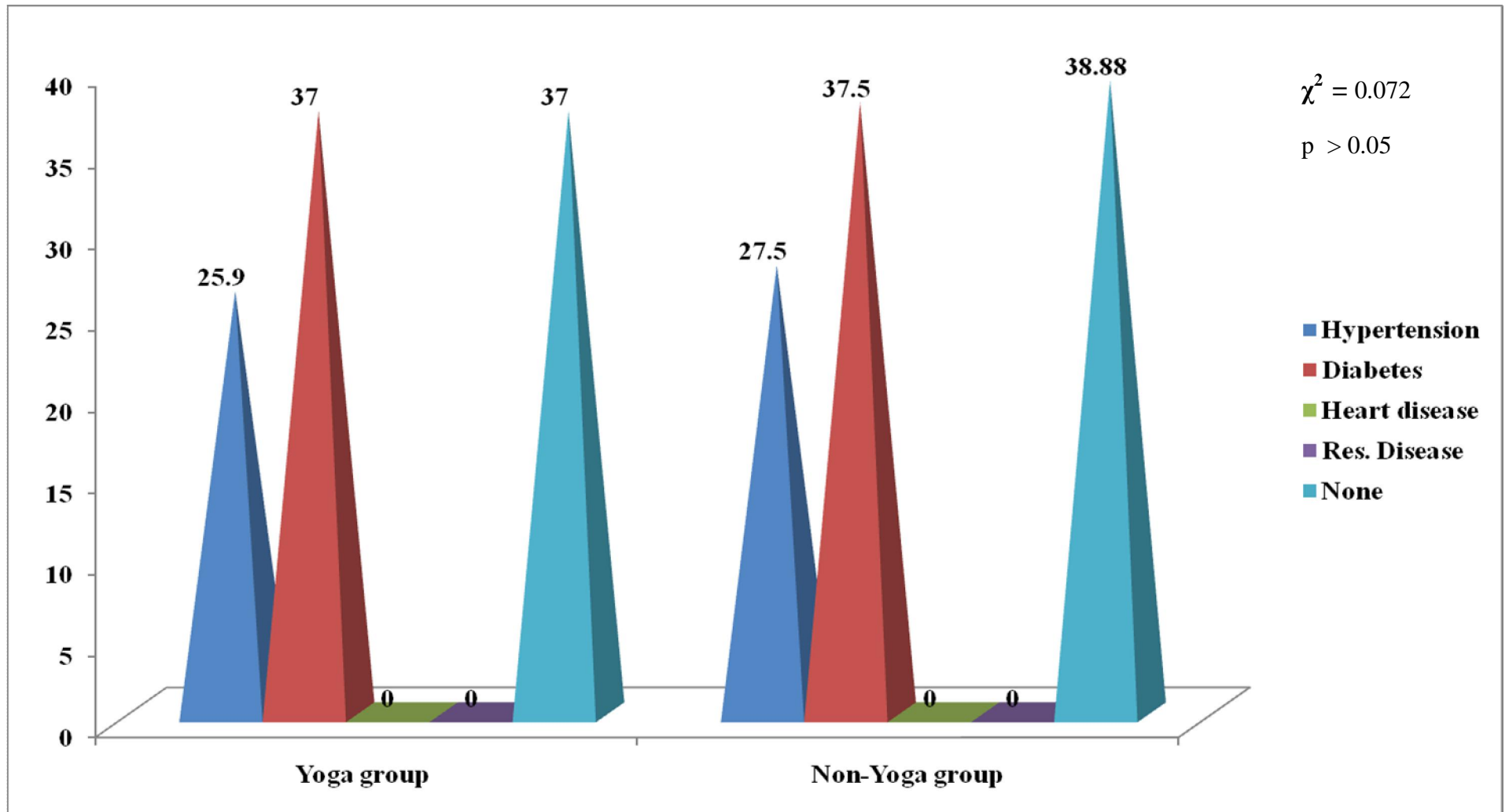
**Table. 5 Frequency, Percentage and Chi-square Values of Clinical Variables (categorical) among Yoga and Non-Yoga group of Menopausal women for homogeneity**

Clinical Variables (categorical)	Components	Yoga group (n=108)		Non-Yoga group (n=120)		$\chi^2$	df	Sig
		f	%	f	%			
<b>Breast examination Findings</b>	Soft, Normal	108	100.0	120	100.0	Nil	Nil	Nil
	Others	Nil	Nil	Nil	Nil			
<b>Fracture History</b>	Nil	102	94.4	113	94.2	0.008	1	P>0.05
	Yes	6	5.6	7	5.8			
<b>Dietary History</b>	Coffee / Tea	70	64.8	80	66.7	0.218	3	P>0.05
	Soft drinks	26	24.1	26	21.7			
	Both	10	9.3	12	10.0			
	Nil	2	1.9	2	1.7			

It can be inferred from Table 5, Fig. 7 & Fig.8 that majority of them had irregular as the nature of menstrual cycle before menopause (74.1%, 77.5%), all of them had normal Breast examination findings (100%, 100%), most of them had no Fracture History (94.4%, 94.2%), consumed coffee and tea (64.8%, 66.7%) and majority of the menopausal women had diabetes (37.0%, 37.5%) in Yoga and Non-Yoga group respectively. There was no statistically significant difference (P>0.05) between the groups. Hence the two groups were suggestive to be comparable and homogenous in nature.



**Fig. 7 Percentage Distribution of Nature of Menstrual Cycle of Menopausal Women before Menopause**



**Fig. 8 Percentage Distribution of Co-morbid conditions in Menopausal Women**

**Table. 6 Mean, Standard deviation & ‘t’ value of Clinical Variables (continuous) in the Pretest among the Yoga and Non-Yoga group of Menopausal women for homogeneity**

Clinical Variables (Continuous)	Yoga group (n=108)		Non-Yoga group (n=120)		‘t’	df	Sig.
	Mean	SD	Mean	SD			
	Water intake (Litres)	1.9	0.41	1.9			
Height (cms)	156.2	5.7	156.2	5.6	0.022	226	P>0.05
Weight (Kg)	63.0	6.8	63.0	6.6	0.033	226	P>0.05
BMI	25.8	2.2	25.8	2.1	0.002	226	P>0.05
Pulse <sub>beats/Min</sub>	82.2	5.3	81.6	5.0	0.933	226	P>0.05
SBP <sub>mm/Hg</sub>	124.2	14.5	123.6	13.4	0.361	226	P>0.05
DBP <sub>mm/Hg</sub>	80.6	8.4	80.0	8.2	0.519	226	P>0.05
Respiratory Rate <sub>/Min</sub>	22.3	1.6	21.9	1.1	1.855	226	P>0.05
WC (cms)	95.0	8.2	94.8	8.1	0.205	226	P>0.05
Somatic symptoms	9.2	2.2	9.4	1.8	0.761	226	P>0.05
Psychological symptoms	10.4	1.9	10.4	1.8	0.132	226	P>0.05
Urogenital symptoms	6.1	1.9	6.4	1.4	1.723	226	P>0.05
Quality of Life	147.1	14.5	147.5	13.9	0.220	226	P>0.05

The data presented in table 6 shows The difference of means between the two groups were not statistically significant (P>0.05). Hence the two groups were comparable groups clinical (continuous) variables such as Water intake in litres

(1.9±0.41, 1.9±0.4), Height in cms (156.2± 5.7, 156.2 ± 5.6), weight in kg (63.0 ± 6.8, 63.0 ± 6.6) BMI (25.8± 2.2, 25.8± 2.1), Waist Circumference in cms (95.0 ± 8.2, 94.8±8.1), Pulse (82.2 ±5.3 ,81.6±5.0), Systolic Blood Pressure (124.2±14.5,123.6±13.4) Diastolic Blood Pressure (80.6±8.4 , 80.0 ± 8.2), Respiratory rate/mt (22.3 ± 1.6, 21.9 ± 1.1), Menopausal Symptoms – Somatic symptoms (9.2 ± 2.2 , 9.4 ± 1.8), psychological symptoms (10.4 ± 1.9, 10.4 ± 1.8) and urogenital symptoms(6.1 ± 1.9, 6.4 ± 1.4) and menopause specific quality of life (147.1 ± 14.5, 147.5 ± 13.9). Pre test means had been compared between the Yoga and Non-Yoga groups for homogeneity.

**Section 2: Pre and Post test Assessment of Clinical Variables, Menopausal Symptoms and Menopause Specific Quality of Life in Yoga and Non – Yoga group of Menopausal women.**

**Table. 7 Pre and Post test Assessment of Clinical Variables in Yoga and Non – groups of Menopausal women.**

Clinical Variables	Category	Score	Yoga group (n=108)				Non-Yoga group (n=120)				
			Pre test		Post test		Pre test		Post test		
			f	%	f	%	f	%	f	%	
<b>1. BMI</b>	Under weight	<18.5	2	1.9	0	0.0	2	1.7	2	1.7	
	Normal	18.5-25	36	33.3	54	50.0	40	33.3	36	30.0	
	Over weight	25-30	66	61.1	54	50.0	74	61.7	79	65.8	
	Obese	≥30	4	3.7	0	0.0	4	3.3	3	2.5	
<b>2. Pulse rate</b>	Low	<72	1	0.9	6	5.6	2	1.7	0	0.0	
	Normal	72-80	32	29.6	52	48.1	38	31.7	16	13.3	
	High	≥80	75	69.5	50	46.3	80	66.7	104	86.7	
<b>3. BP</b>	Less										
	<b>SBP</b>	than120	<120	29	26.8	49	45.4	22	18.3	23	19.2
	Normal										
	range	120-130	60	55.6	50	46.3	69	57.5	79	65.8	
	High SBP	≥130	19	17.6	9	8.3	29	24.2	18	15.0	
<b>DBP</b>	Less than 80	<80	33	30.6	85	78.7	41	34.2	26	21.7	
	Normal										
	range	80-90	59	54.6	23	21.3	35	29.2	62	51.7	
	High DBP	≥90	16	14.8	0	0.0	44	36.6	32	26.6	

<b>4. Resp rate</b>	Normal	16-20	18	16.7	63	58.3	43	35.8	35	29.1
	range									
	Abnormal	>20	90	83.3	45	41.7	77	64.2	85	70.9
<b>5. WC</b>	Normal	80 -88	26	24.1	35	32.4	31	25.8	28	23.3
	High risk	>88	82	75.9	73	67.6	89	74.2	92	76.7

It can be inferred from table 7 that majority of the menopausal women were overweight in the pretest (61.1%,61.7%) in Yoga and Non-Yoga group respectively whereas in the post test 50% were overweight and 50% were in normal BMI range respectively in Yoga group as compared to Non Yoga group. Majority of them had high pulse rate in the pretest (69.5%, 66.7%) in the Yoga and Non-Yoga group respectively and in the post test almost 48.1% had normal pulse and 46.3% had high pulse rate in the Yoga group.

Majority of them had SBP of 120-130 mm of Hg in the pretest (55.6%, 57.5%) in the Yoga and Non-Yoga group respectively. In the post test, 46.3% had SBP of 120-130mm of Hg and 45.4% had SBP of less than 120 mm of Hg. This shows a significant reduction of SBP in Yoga group. With regard to Non-Yoga group, most of them (65.8%) had SBP of 120-130 mm of Hg in the post test. Majority of the menopausal women in the Yoga group (pretest) had DBP of 80-90 mm of Hg (54.6%) and high DBP 14.8% where as in the post test 78.7% had DBP of less than 80 mm of Hg, 21.3% had DBP of 80-90 mm of Hg and none had high DBP. This shows a significant reduction of DBP in Yoga group. In the Non-Yoga group 36.6% had high DBP in the pretest whereas 26.6% had high DBP in the post test.

Majority of them in the pretest had respiratory rate above 20/mt (83.3%, 64.2%) in Yoga and Non-Yoga group respectively. Whereas in the post test 58.3%

had normal respiratory rate in the Yoga group as compared to 29.1% in Non – Yoga group. This shows a reduction in the scores of respiratory rate in Yoga group. Majority of the menopausal women's waist circumference were in high risk category in the pretest (75.9%,74.2%) in Yoga and Non- Yoga group respectively as compared to their post test waist circumference in the high risk category (67.6%, 76.7%) in Yoga and Non-Yoga group respectively.

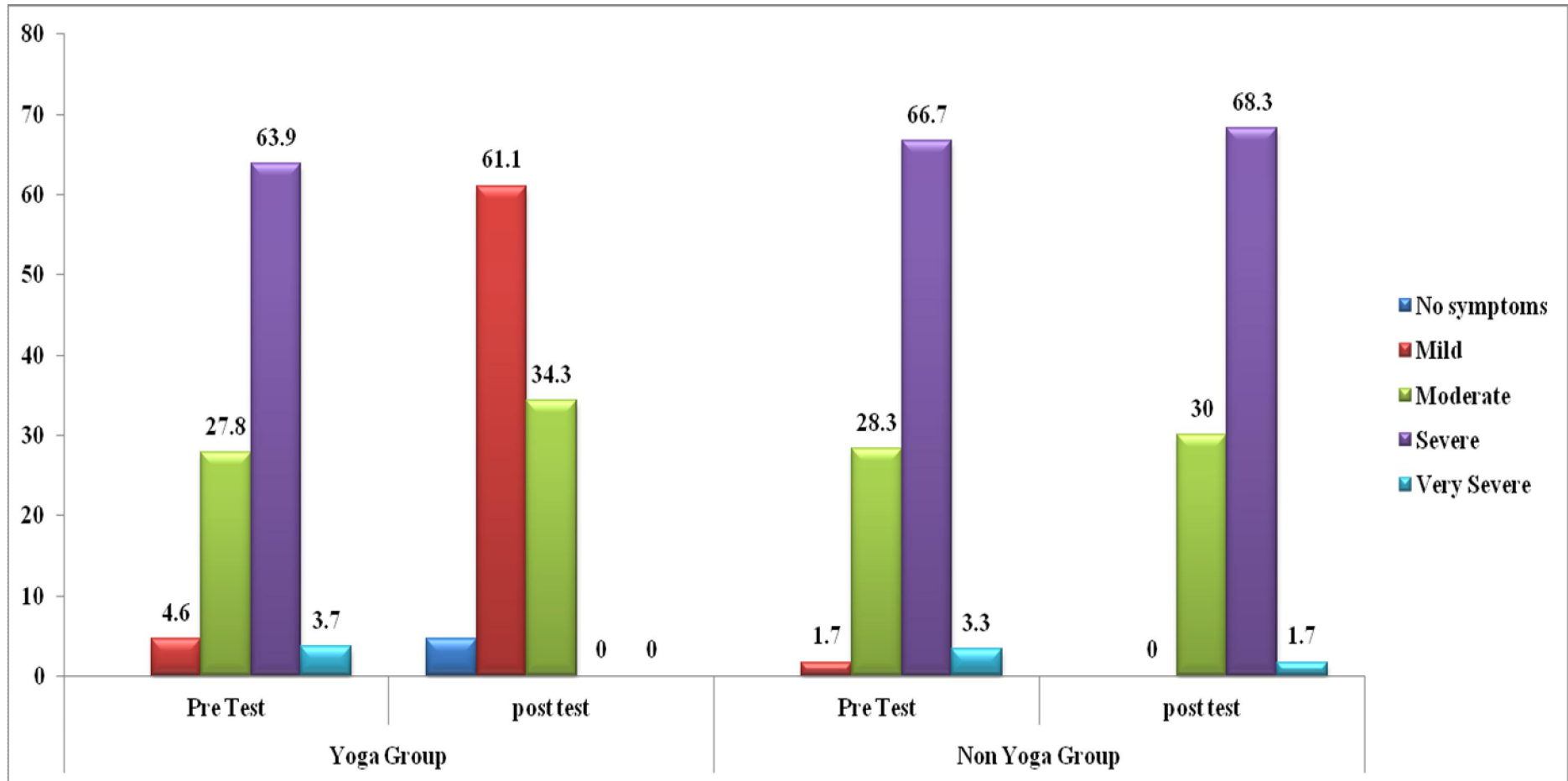
### **Pretest and Post test assessment of Domain wise Menopausal Symptoms in Yoga and Non-Yoga groups of Menopausal Women**

Fig. 9 illustrates that most of the women had severe Somato-vegetative symptoms (63.9%, 66.7%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (61.1%) of them experienced mild Somato-vegetative symptoms and significant (34.3%) of them experienced moderate level of Somato-vegetative symptoms after post test in the Yoga group.

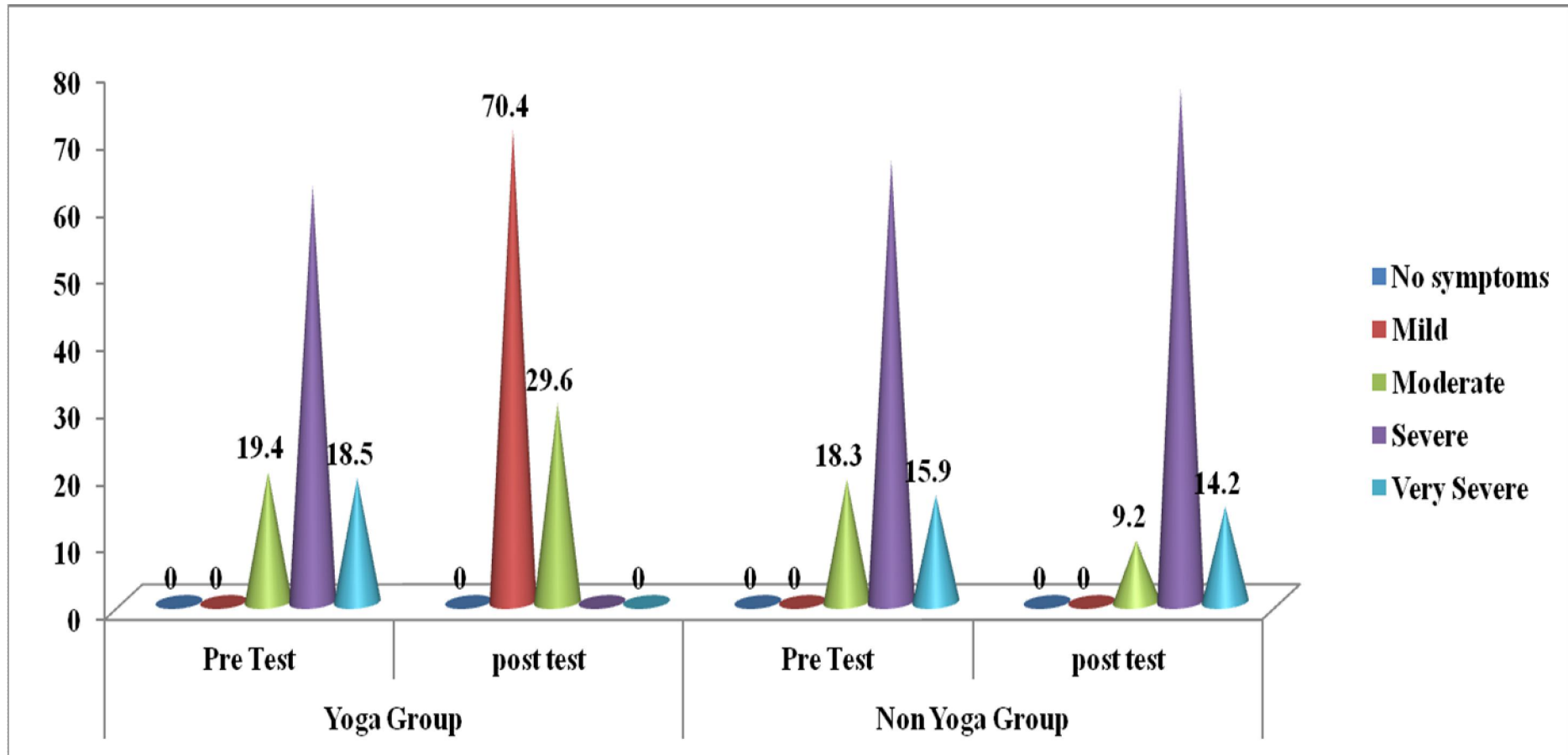
Fig.10 depicts that most of the women had severe psychological symptoms (62.1%, 65.8%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (70.4%) of them experienced mild psychological symptoms and significant (29.6%) of them experienced moderate level of psychological symptoms after post test in the Yoga group.

Fig.11 illustrated that most of the women had moderate urogenital symptoms (42.6%, 48.3%) in the pretest in Yoga and Non-Yoga group respectively. Whereas majority (71.3%) of them experienced mild urogenital symptoms and significant (21.3%) of them experienced moderate level of urogenital symptoms.

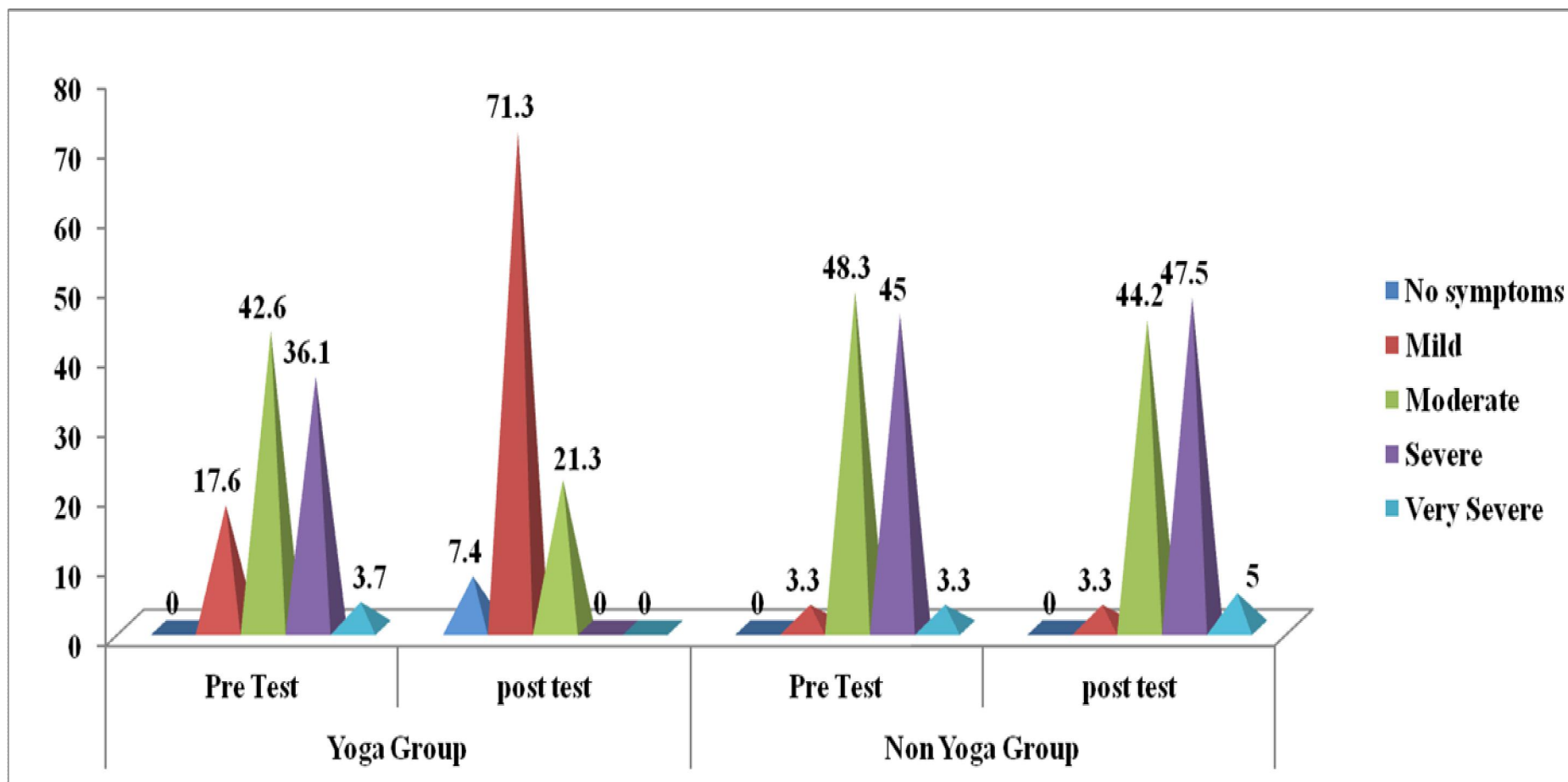




**Fig.9 Percentage distribution of Pre and Post test levels of (Somato-vegetative domain) menopausal symptoms in Yoga and Non Yoga groups of menopausal women.**



**Fig.10 Percentage distribution of Pre and Post test levels of (psychological domain) menopausal symptoms in yoga and non yoga group of menopausal women**



**Fig.11 Percentage distribution of Pre and Post test levels of (Urogenital domain) menopausal symptoms in Yoga and Non Yoga groups of menopausal women**

**Table. 8 Pre and Post test Assessment of Total Menopausal Symptoms (MRS) in Yoga and Non – Yoga groups of Menopausal women.**

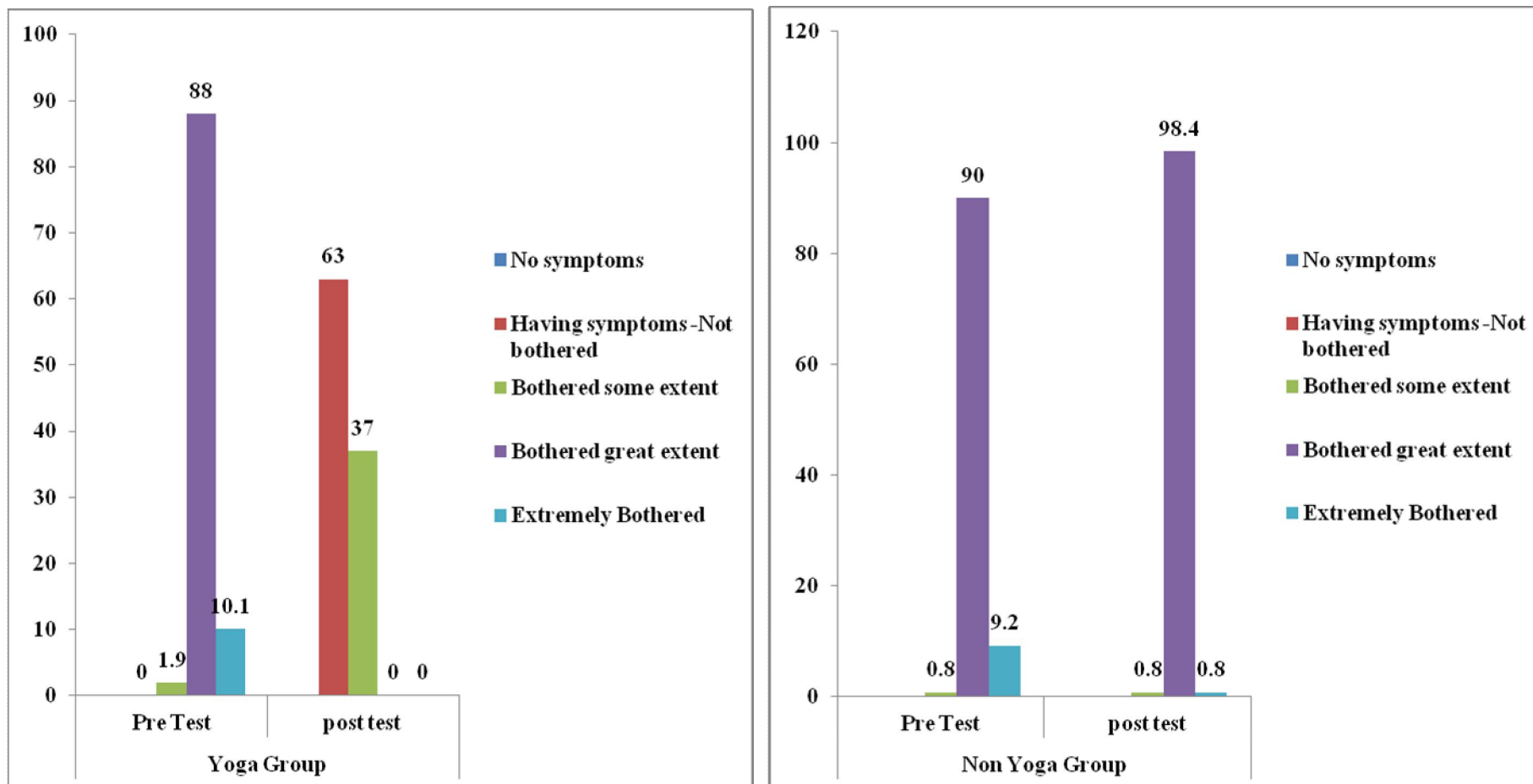
Menopausal Symptoms	Category	Score	Yoga Group (n=108)				Non-Yoga group (n=120)			
			Pretest		Post test		Pretest		Post test	
			f	%	f	%	f	%	f	%
<b>Total Menopausal Symptoms</b>	No symptoms	0	0	0.0	0	0.0	0	0.0	0	0.0
	Mild	1-11	0	0.0	78	72.2	0	0.0	0	0.0
	Moderate	12-22	24	22.2	30	27.8	15	12.5	9	7.5
	Severe	23-33	77	71.3	0	0.0	99	82.5	106	88.3
	Very Severe	34-44	7	6.5	0	0.0	6	5.0	5	4.2

The data presented in table 8 depicts the total menopausal symptoms, most of the women had severe menopausal symptoms (71.3%, 82.5%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (72.2%) of them experienced mild menopausal symptoms and significant (27.8%) of them experienced moderate level of menopausal symptoms after post test in the Yoga group.

**Table. 9 Pre And Post Test Assessment of Menopause Specific Quality of Life in Yoga and Non Yoga Group of Menopausal Women**

MENQOL	Category	Score	Yoga Group (n=108)				Non-Yoga group (n=120)			
			Pre test		Post test		Pre test		Post test	
			f	%	f	%	f	%	f	%
Quality of life (MENQOL)	No symptoms	1-27	0	0.0	0	0.0	0	0.0	0	0.0
	Having symptoms - Not bothered	28-54	0	0.0	68	63.0	0	0.0	0	0.0
	Bothered some extent	55-108	2	1.9	40	37.0	1	0.8	1	0.8
	Bothered great extent	109-162	95	88.0	0	0.0	108	90.0	118	98.4
	Extremely Bothered	163-216	11	10.1	0	0.0	11	9.2	1	0.8

It can be elicited from table.9 that most of the women were under the category menopausal symptoms – bothered great extent (88.0%, 90.0%) in the pretest in Yoga and Non-Yoga group respectively. Whereas majority (63.0%) of them were having menopausal symptoms- not bothered and significant percentage (37.0%) of them had menopausal symptoms-bothered to some extent after post test in the Yoga group. The data is also presented for better understanding in graphical form in Fig.12.



**Fig.12 Percentage distribution of Pre and Post test levels of MENQOL in Yoga and non Yoga groups of menopausal women**

**Section 3 : Mean, Standard Deviation and t value showing the Effectiveness of Yoga in Controlling Clinical Variables, Menopausal Symptoms and improving Menopause Specific Quality of Life within and between groups among Yoga and Non –Yoga group of Menopausal women**

**Table. 10 Mean, Standard Deviation and ‘t’ value showing the Effectiveness of Yoga in controlling Clinical Variables within groups among Yoga and Non – Yoga group of Menopausal women**

Variable	Groups	Pre test		Post test		Improved		‘t’	df	Sig
		Mean	SD	Mean	SD	Mean	SD			
<b>BMI</b>	Yoga	25.8	2.2	25.0	2.0	0.8	0.4	21.181	107	P<0.001
	NonYoga	25.8	2.1	25.9	2.0	0.1	0.5	0.892	119	P>0.05
<b>Waist Circumference</b>	Yoga	95.0	8.2	92.0	7.6	3.0	1.2	24.719	107	P<0.001
	NonYoga	94.8	8.1	94.9	8.2	0.1	1.4	0.906	119	P>0.05
<b>SBP</b>	Yoga	124.4	14.5	118.0	10.9	6.2	7.9	8.165	107	P<0.001
	Non-Yoga	123.6	13.4	124.2	10.5	0.6	7.5	0.892	119	P>0.05
<b>DBP</b>	Yoga	80.3	8.0	73.7	4.8	6.6	6.7	10.243	107	P<0.001
	Non-Yoga	81.1	7.5	81.8	6.6	0.7	5.9	1.438	119	P>0.05
<b>Pulse <sub>beats/min</sub></b>	Yoga	82.2	5.3	77.4	4.4	4.8	4.7	10.641	107	P<0.001
	Non-Yoga	81.5	5.0	82.1	4.1	0.6	3.2	1.864	119	P>0.05
<b>Respiratory Rate<sub>/min</sub></b>	Yoga	22.3	1.6	20.0	2.2	2.3	2.3	10.371	107	P<0.001
	Non-Yoga	21.4	1.5	21.6	1.2	0.2	1.6	0.905	119	P>0.05

Table 10 shows the effectiveness of Yoga in controlling the clinical variables namely BMI and waist circumference from pre to post tests. The pretest mean BMI of Yoga group was 25.8±2.2 and after Yoga it was 25.0±2.0. The improvement 0.8±0.4 was statistically very highly significant (P<0.001). The mean BMI of Non-Yoga

group in the pretest was  $25.8 \pm 2.1$  and in the post test was  $25.9 \pm 2.0$ . The improvement  $0.1 \pm 0.5$  was not statistically significant ( $P > 0.05$ ). The pretest mean waist circumference of Yoga group was  $95.0 \pm 8.2$  cm and after Yoga was  $92.0 \pm 7.6$  cm. The improvement  $3.0 \pm 1.2$  cm was statistically very highly significant ( $P < 0.001$ ).

The pretest mean SBP of Yoga group was  $124.4 \pm 14.5$  mm/hg and after Yoga was  $118 \pm 10.0$  mm/hg. The improvement  $6.2 \pm 7.9$  mm/hg was statistically very highly significant ( $P < 0.001$ ). The pretest mean SBP of Non-Yoga group was  $123.6 \pm 13.4$  mm/hg and in the post test was  $124.2 \pm 10.5$  mm/hg. The improvement  $0.6 \pm 7.5$  mm/hg was not statistically significant ( $P > 0.05$ ). The pretest mean DBP of Yoga group was  $80.3 \pm 8.0$  mm/hg and after Yoga was  $73.7 \pm 4.8$  mm/hg. The improvement  $6.6 \pm 6.7$  mm/hg was statistically very highly significant ( $P < 0.001$ ). The pretest mean DBP of Non Yoga group was  $81.1 \pm 7.5$  mm/hg and in the post test was  $81.8 \pm 6.6$  mm/hg. The improvement  $0.7 \pm 5.9$  mm/hg was not statistically significant ( $P > 0.05$ ).

The pretest mean pulse rate of Yoga group was  $82.2 \pm 5.3$  beats/min and after Yoga was  $77.4 \pm 4.4$  beats/min. The improvement  $4.4 \pm 4.8$  beats/min was statistically very highly significant ( $P < 0.001$ ). The pretest mean pulse rate of Non Yoga group was  $81.5 \pm 5.0$  beats/min and in the post test was  $82.1 \pm 4.1$  beats/min. The improvement  $0.6 \pm 3.2$  beats/min was not statistically significant ( $P > 0.05$ ). The pretest mean respiration rate of Yoga group was  $22.3 \pm 1.6$  /min and after Yoga was  $20.0 \pm 2.2$  /min. The improvement  $2.3 \pm 2.3$  /min was statistically very highly significant ( $P < 0.001$ ).



**Table . 11**

**Mean, Standard Deviation and ‘t’ value showing the Effectiveness of Yoga in controlling menopausal symptoms (domainwise and total) within groups among Yoga and Non – Yoga group of Menopausal women**

Variable	Groups	Pre test		Post test		Improved		“t”	df	Sig
		Mean	SD	Mean	SD	Mean	SD			
<b>Somatic</b>	Yoga	9.2	2.2	3.9	1.5	5.3	1.4	39.682	107	P<0.001
	Non-Yoga	9.4	1.9	9.6	1.7	0.2	1.1	1.960	119	P>0.05
<b>Psychological</b>	Yoga	10.4	1.9	4.0	1.2	6.4	1.8	37.331	107	P<0.001
	Non-Yoga	10.4	1.8	10.5	1.6	0.2	0.9	1.747	119	P>0.05
<b>Urogenital</b>	Yoga	5.9	2.1	2.7	1.2	3.2	1.5	21.630	107	P<0.001
	Non-Yoga	6.5	1.6	6.7	1.6	0.2	0.6	3.556	119	P>0.05
<b>Total Menopausal Symptoms MRS</b>	Yoga	25.4	4.7	10.6	2.7	14.7	3.3	45.731	107	P<0.001
	Non-Yoga	26.4	3.5	26.8	3.2	0.4	1.6	1.715	119	P>0.05

It can be depicted from table 11 that the mean values in somatic domain of Yoga group before Yoga was 9.2±2.2 and after Yoga was 3.9±1.5. The mean improvement was 5.3±1.4 and the same was statistically very highly significant (P<0.001). The mean psychological domain of Yoga group before Yoga was 10.4±1.9 and after Yoga was 4.0±1.2. The mean improvement was 6.4±1.8 and the same was statistically very highly significant (P<0.001). The mean urogenital domain of Yoga group before Yoga was 5.9±2.1 and after Yoga was 2.7±1.2. The mean improvement was 3.2±1.5 and the same was statistically very highly significant (P<0.001).

The mean total menopausal symptoms of Yoga group before Yoga was 25.4±4.7 and after Yoga was 10.6±2.7. The mean improvement was 14.7±3.3 and the

same was statistically very highly significant ( $P < 0.001$ ). Hence the null hypothesis  $H_{01}$  there will be no significant difference in the menopausal symptoms before and after Yoga among the Yoga and Non-Yoga groups of menopausal women was rejected.

**Table. 12**  
**Mean, Standard Deviation and t value showing the Effectiveness of Yoga on**  
**Menopause Specific Quality of Life within groups among Yoga and Non – Yoga**  
**group of Menopausal women**

Groups	Pre test		Post test		Improved		‘t’	df	Sig
	Mean	SD	Mean	SD	Mean	SD			
<b>Yoga</b> <b>(n=108)</b>	147.1	14.5	57.0	15.1	90.1	12.8	72.923	107	P<0.001
<b>Non- Yoga</b> <b>(n=120)</b>	147.5	13.9	140.5	13.1	7.0	4.9	15.593	119	P<0.001

Table 12 elicits the effect of Yoga on MENQOL within the Yoga and non Yoga groups. The mean MENQOL before Yoga of Yoga group was 147.1±14.5 and after Yoga was 57.0±15.1. The mean reduction was 90.1±12.8 and the same was statistically very highly significant (P<0.001). The mean MENQOL before Yoga of non Yoga group was 147.5±13.9 and after Yoga was 140.5±13.1. The mean reduction was 7.0±4.9 and the same was also statistically very highly significant (P<0.001). Hence the null hypothesis H<sub>02</sub> there will be no significant difference in the effect of Yoga upon quality of life between Yoga and Non-Yoga groups of menopausal women was rejected.

**Table. 13**

**Mean, Standard Deviation and ‘t’ value showing the Effectiveness of Yoga on Menopause Specific Quality of Life between groups among Yoga and Non – Yoga group of Menopausal women**

Variable	Yoga group (n=108)		Non -Yoga group (n=120)		Difference b/w means	“t”	df	Sig
	Mean	SD	Mean	SD				
	<b>Improvement</b>	90.1	12.8	7.0				

The improvements between the two (Yoga group and Non Yoga) groups are compared between the two groups in the table 13. The mean improvement of Yoga group was  $90.1 \pm 12.8$  and the non Yoga group was  $7.0 \pm 4.9$ . The difference between the two means were statistically very highly significant ( $P < 0.001$ ). Hence the null hypothesis  $H_{02}$  there will be no significant difference in the effect of Yoga upon quality of life between Yoga and Non-Yoga groups of menopausal women was rejected.

**Section 4 : Assessment of Levels of Satisfaction on Yoga Intervention among Yoga group of Menopausal women**

**Table. 14 Levels of Satisfaction on Yoga Intervention among Yoga group of Menopausal women**

Levels of satisfaction	Yoga Group (n = 108)	
	f	%
Highly Satisfied (Above 76)	94	87.04
Satisfied (51-75)	14	12.96
Dissatisfied (26-50)	-	-
Highly Dissatisfied (Below 25)	-	-

Table 14 showed that 87.04% of Menopausal women in Yoga group were highly satisfied with Yoga as a mind body intervention and 12.96 % were satisfied. None of them were in the category of dissatisfied and highly dissatisfied.

**Section 5: Assessment of Correlation between Menopausal Symptoms and Menopause Specific Quality of Life in Pre and Post test among Yoga and Non Yoga group of Menopausal women**

**Table. 15 Assessment of Correlation between Menopausal Symptoms (MRS Overall) and Menopause Specific Quality of Life (MENQOL overall) in Pre and Post test among Yoga and Non Yoga group of Menopausal women**

Groups	n	Test	Variable-1	Variable-2	r	Sig	r <sup>2</sup>	%
Yoga	108	Pre	MRS	MENQOL	0.250	P<0.001	0.062	6.2
		Post	MRS	MENQOL	0.358	P<0.001	0.128	12.8
Non-Yoga	120	Pre	MRS	MENQOL	0.239	P<0.05	0.057	5.7
		Post	MRS	MENQOL	0.218	P<0.01	0.048	4.8

Table 15 portrays the correlation between Pretest MRS with Pre MENQOL and Post MRS with Post MENQOL of Yoga and non Yoga groups.

In the Yoga group of menopausal women both variables were positively statistically significantly correlated. The Pre and post MRS determined the MENQOL 6.2% and 12.8% respectively with their r values as 0.250 and 0.358. Similarly in the Non Yoga group, the Pre and post MRS determined the MENQOL 5.7% and 4.8% respectively. Hence the null hypothesis H<sub>03</sub> there will be no correlation between menopausal symptoms and quality of life in Yoga and Non-Yoga group of menopausal women was rejected.

**Table. 16**

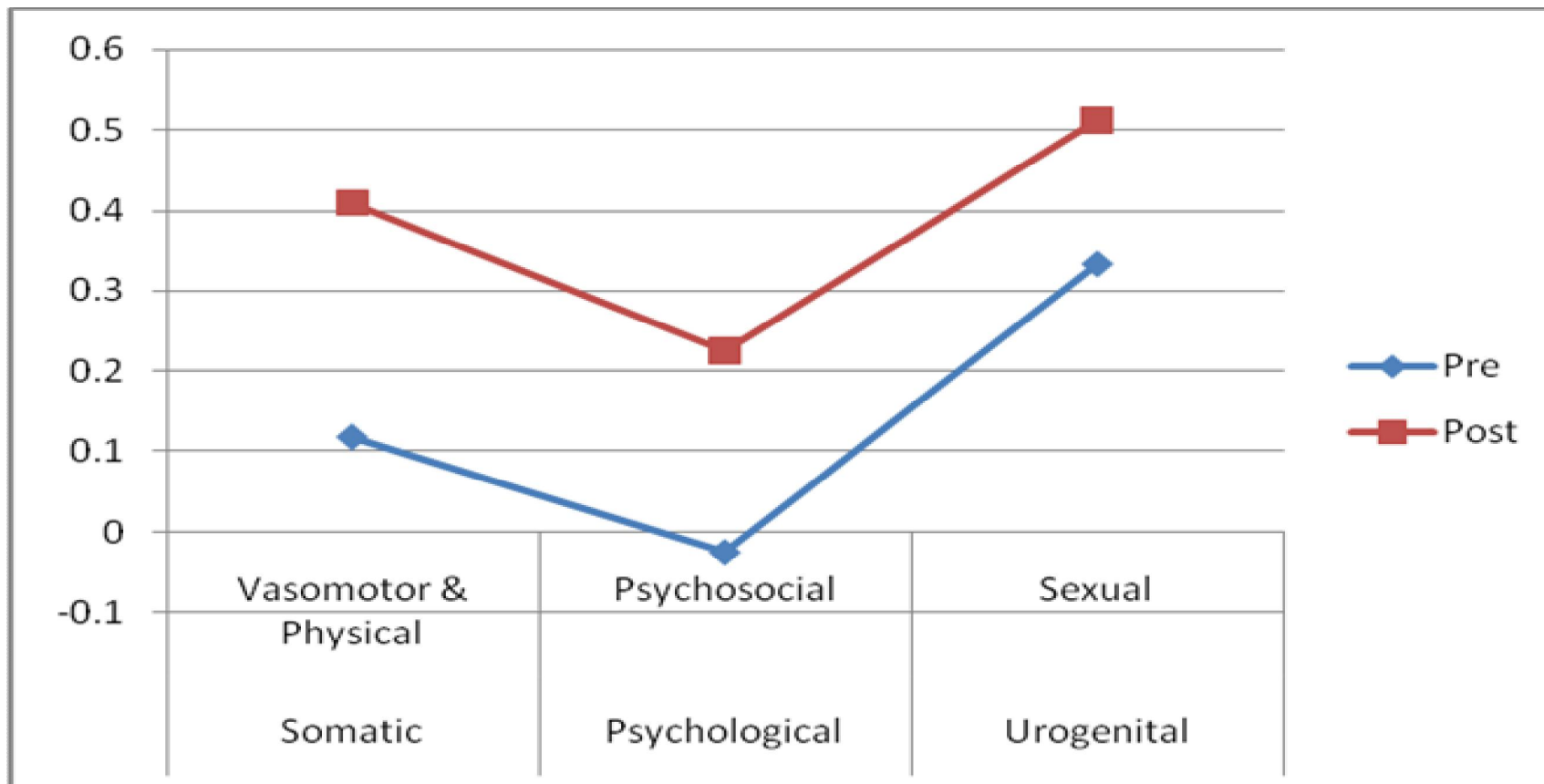
**Assessment of Correlation between Menopausal Symptoms (domain wise) and Menopause Specific Quality of Life (Domain wise) in Pre and Post test among Yoga and Non Yoga group of Menopausal women.**

Group	n	Tests	MRS domains	MENQOL domains	r	sig	r <sup>2</sup>	%
<b>Yoga</b>	108	Pre	Somatic	Vasomotor & Physical	0.118	P>0.05	0.014	1.4
			Psychological	Psychosocial	-0.025	P>0.05	0.001	0.1
			Urogenital	Sexual	0.333	P<0.001	0.111	11.1
		Post	Somatic	Vasomotor & Physical	0.409	P<0.001	0.167	16.7
			Psychological	Psychosocial	0.225	P<0.001	0.051	5.1
			Uro-genital	Sexual	0.512	P<0.001	0.111	26.2
<b>Non Yoga</b>	120	Pre	Somatic	Vasomotor & Physical	0.316	P<0.001	0.100	10.0
			Psychological	Psychosocial	0.149	P>0.05	0.022	2.2
			Urogenital	Sexual	0.781	P<0.001	0.610	61.0
		Post	Somatic	Vasomotor & Physical	0.296	P<0.01	0.088	8.8
			Psychological	Psychosocial	0.075	P>0.05	0.006	0.6
			Urogenital	Sexual	0.575	P<0.001	0.331	33.1

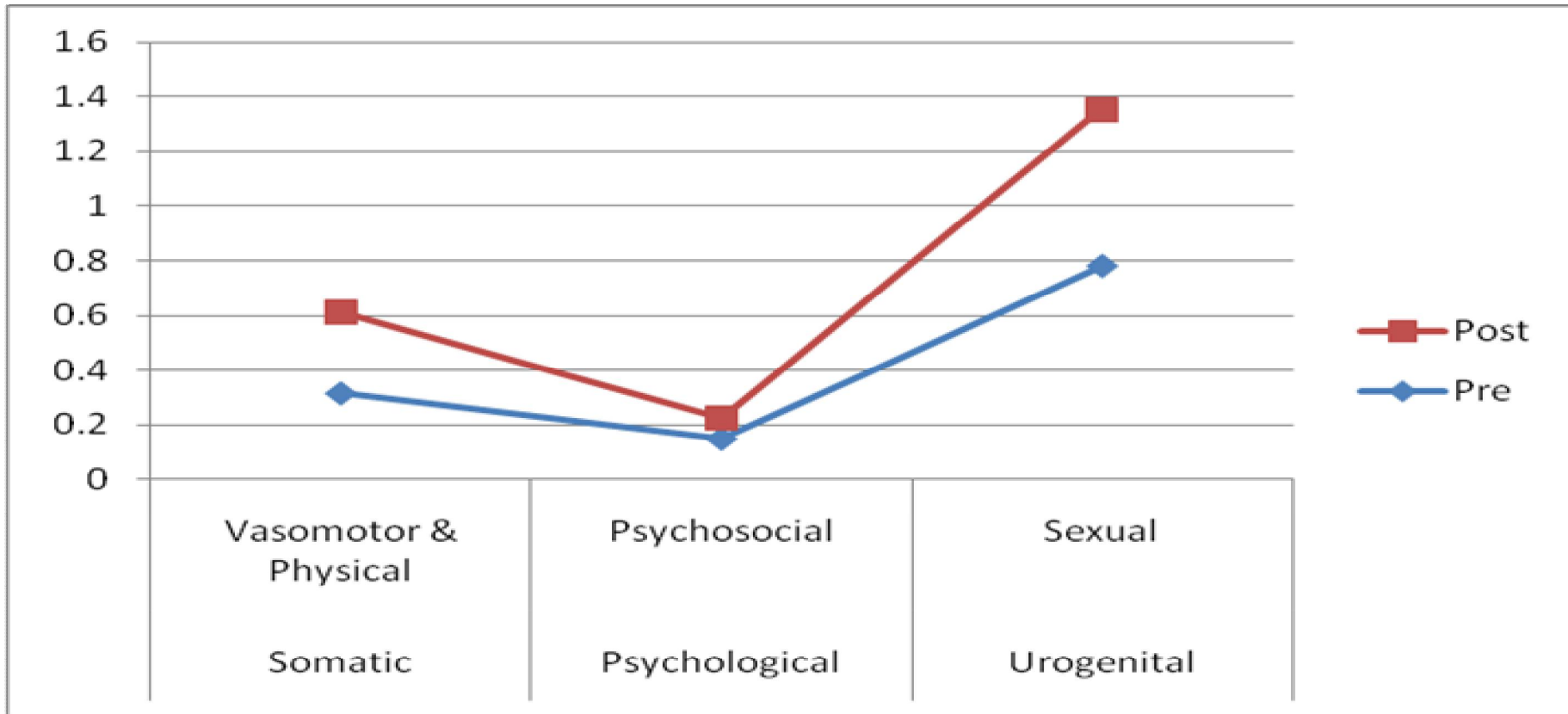
Table 16 depicts the relationships between the domains of MRS and MENQOL of Yoga group in pre and post tests compared. In the Yoga group the pretest MRS

domains namely somatic, psychological and urogenital were correlated with respective MENQOL domains and they were positively correlated ( $P < 0.001$ ). There is positive correlation between somatic domain of MRS and the MENQOL (vasomotor and physical domain) 0.409, psychological domain of MRS and MENQOL (psychosocial) 0.225, uro-genital domain of MRS and MENQOL (sexual) 0.512 in the Yoga group after the intervention when compared to the non Yoga group. The post test Yoga group domains determined as 16.7%, 5.1% and 26.2% respectively. In the non Yoga group the pre MRS domains namely somatic, psychological and urogenital were correlated with respective MENQOL domains and they were positively correlated except Psychological domain ( $r = 0.075$ ). Hence the null hypothesis  $H_{03}$  there will be no correlation between menopausal symptoms and quality of life in Yoga and Non-Yoga group of menopausal women was rejected. The data is also presented for better clarity in graphical form in Fig. 13 and Fig. 14





**Fig. 13 Assessment of correlation between menopauses symptoms (MRS) and MENQOL Domain wise in pre and post-tests among Yoga group of menopausal women.**



**Fig. 14 Assessment of correlation between menopausal symptoms (MRS) and MENQOL Domain wise in pre and post-tests among Non-Yoga group of menopausal women.**

**Section 6: Association between Demographic Variable and Clinical Variables with their Menopausal Symptoms and quality of Life in Yoga and Non –Yoga group of Menopausal women in the Pretest and Post test.**

**Table. 17 Association between demographic variables of Yoga and Non-Yoga groups with their Menopausal Symptoms in the pre test.**

Demographic variables	Category	Yoga group( n=108)					Non Yoga group (n=120)				
		≤M	>M	$\chi^2$	df	Sig	≤M	>M	$\chi^2$	df	Sig
Age (years)	<60	46	41	0.041	1	P>0.05	66	33	0.065	1	P>0.05
	60+	11	10				14	7			
Duration (years)	≤ 4 (M)	26	27	0.578	1	P>0.05	48	21	0.614	1	P>0.05
	>4(M)	31	24				32	19			
Marital status	Married	45	47	2.749	1	P>0.05	67	36	0.420	1	P>0.05
	Others	12	4				13	4			
Edun. status	<Hr Sec	42	35	0.336	1	P>0.05	54	25	0.586	1	P>0.05
	Hr Sec +	15	16				26	15			
Occupation	Home Maker	44	40	0.026	1	P>0.05	61	32	0.215	1	P>0.05
	Others	13	11				19	8			
Nature of work	Sed & mod	48	48	1.766	1	P>0.05	71	35	0.010	1	P>0.05
	Heavy	9	3				9	5			
Family income	<15000	32	25	0.548	1	P>0.05	49	23	0.156	1	P>0.05
	15000 +	25	26				31	17			
Food habit	Vegetarian	17	7	3.159	1	P>0.05	20	8	0.373	1	P>0.05
	Others	40	44				60	32			
Family type	Nuclear	46	36	1.506	1	P>0.05	65	35	0.750	1	P>0.05
	Joint	11	15				15	5			
Religion	Hindu	48	44	.091	1	P>0.05	62	27	1.392	1	P>0.05
	Others	9	7				18	13			
Nature of Menses before MP	Regular	18	10	2.009	1	P>0.05	21	6	1.935	1	P>0.05
	Irregular	39	41				59	34			

It can be inferred from table 17 that there is no significant association of demographic variables with their menopausal symptoms in the pretest among Yoga and Non Yoga groups of Menopausal women

**Table. 18 Association between demographic variables of Yoga and Non-Yoga Group of Menopausal women with their MRS in post test.**

Demographic variables	Category	Yoga group (n=108)					Non Yoga group (n=120)				
		≤M	>M	$\chi^2$	df	Sig	≤M	>M	$\chi^2$	df	Sig
Age (years)	<60	62	25	0.205	1	P>0.05	56	43	0.968	1	P>0.05
	60+	16	5				12	9			
Duration (years)	≤ 4 (M)	37	16	0.302	1	P>0.05	42	27	1.168	1	P>0.05
	>4(M)	41	14				26	25			
Marital status	Married	64	28	1.383	1	P>0.05	58	45	0.038	1	P>0.05
	Others	14	2				10	7			
Edun. status	<Hr Sec	57	20	0.435	1	P>0.05	45	34	0.008	1	P>0.05
	Hr Sec +	21	10				23	18			
Occupation	Home Ma	60	24	0.119	1	P>0.05	51	42	0.562	1	P>0.05
	Others	18	6				17	10			
Nature of work	Sed& mod	68	28	0.362	1	P>0.05	61	45	0.592	1	P>0.05
	Heavy	10	2				7	7			
Family income	<15000	44	13	1.487	1	P>0.05	41	31	0.006	1	P>0.05
	15000 +	34	17				27	21			
Food habit	Vegetarian	21	3	3.590	1	P>0.05	17	11	0.24	1	P>0.05
	Others	57	27				51	41			
Family type	Nuclear	57	25	1.247	1	P>0.05	55	45	0.679	1	P>0.05
	Joint	21	5				13	7			
Religion	Hindu	66	26	0.072	1	P>0.05	52	37	0.435	1	P>0.05
	Others	12	4				16	15			
Nature of Menses before MP	Regular	25	3	5.486	1	*P<0.05	21	6	6.323	1	*P<0.05
	Irregular	53	27				47	46			

Table 18 depicts that there is significant association between Nature of Menstrual Cycle before Menopause and Menopausal Symptoms (MRS) at  $P < 0.05$  level of significance in the post test among both Yoga and Non Yoga groups of menopausal women. Other demographic variables did not show any significant association. Hence the Null hypothesis  $H_{04}$  there will be no significant association between selected demographic variables and menopausal symptoms before and after administration of Yoga among the Yoga and Non-Yoga groups of menopausal women was partially rejected.

**Table. 19 Association between demographic profiles of Yoga and non Yoga groups with their MENQOL in pre test**

Demographic variables	Category	Yoga group (n=108)					Non Yoga group (n=120)				
		≤M	>M	$\chi^2$	df	Sig	≤M	>M	$\chi^2$	df	Sig
Age (years)	<60	43	44	0.403	1	P>0.05	51	48	0.519	1	P>0.05
	60+	12	9				9	12			
Duration (years)	≤ 4 (M)	24	29	1.326	1	P>0.05	34	35	.034	1	P>0.05
	>4(M)	31	24				26	25			
Marital status	Married	43	49	3.298	1	P>0.05	50	53	0.617	1	P>0.05
	Others	12	4				10	7			
Education status	<Hr Sec	41	36	0.578	1	P>0.05	41	38	0.333	1	P>0.05
	Hr Sec +	14	17				19	22			
Occupation	Home Makers	42	42	0.719	1	P>0.05	47	46	0.048	1	P>0.05
	Others	13	11				13	14			
	Nature of work	Sedent & mod	50				46	0.463			
	Heavy	5	7	11	3						
Family income	<15000	33	24	2.346	1	P>0.05	38	34	0.556	1	P>0.05
	15000 +	22	29				22	26			
Food habit	Vegetarian	13	11	0.130	1	P>0.05	18	10	2.981	1	P>0.05
	Others	42	42				42	50			
Family type	Nuclear	41	41	0.117	1	P>0.05	52	48	0.327	1	P>0.05
	Joint	14	12				8	12			
Religion	Hindu	48	44	0.387	1	P>0.05	49	40	3.523	1	P>0.05
	Others	7	9				20	11			
Nature of Menstruation before Menopause	Regular	16	12	0.585	1	P>0.05	14	13	0.048	1	P>0.05
	Irregular	39	41				46	47			

Table 19 shows that there is significant association between nature of work and Quality of Life (MENQOL) at  $P < 0.05$  level of significance in the pretest among Yoga and Non-Yoga groups of menopausal women. Other demographic variables did not show any association with Quality of Life (MENQOL) in the pretest. Hence the Null Hypothesis  $H_{06}$  there will be no significant association between selected demographic variables and quality of life in the pre and post test among Yoga and Non-Yoga group of menopausal women was partially rejected.

**Table. 20 Association between demographic variables of Yoga and Non-Yoga groups with their MENQOL in post test.**

Demog variable	Category	Yoga group (n=108)					Non Yoga group (n=120)				
		≤M	>M	$\chi^2$	df	Sig	≤M	>M	$\chi^2$	df	Sig
Age (years)	<60	49	38	0.745	1	P>0.05	49	50	0.058	1	P>0.05
	60+	14	7				11	10			
Duration (years)	≤ 4 (M)	27	26	2.338	1	P>0.05	31	38	1.671	1	P>0.05
	>4(M)	36	19				29	32			
Marital status	Married	52	40	0.839	1	P>0.05	52	51	0.069	1	P>0.05
	Others	11	5				8	9			
Edun. status	<Hr Sec	46	31	0.218	1	P>0.05	43	36	1.815	1	P>0.05
	Hr Sec +	17	14				17	24			
Occupation	Home Ma	45	39	3.527	1	P>0.05	50	43	2.342	1	P>0.05
	Others	18	6				10	17			
Nature of work	Sed & mod	55	41	0.096	1	P>0.05	50	56	2.022	1	P>0.05
	Heavy	8	4				10	4			
Family income	<15000	38	19	3.449	1	P>0.05	39	33	1.250	1	P>0.05
	15000 +	25	26				21	27			
Food habit	Vegetarian	15	9	0.220	1	P>0.05	19	9	3.773	1	P>0.05
	Others	48	36				41	51			
Family type	Nuclear	46	36	0.701	1	P>0.05	52	48	0.960	1	P>0.05
	Joint	17	9				8	12			
Religion	Hindu	56	36	1.643	1	P>0.05	48	41	2.13119	1	P>0.05
	Others	7	9				12	19			
Nature of Menstruation before Menopause	Regular	19	9	1.411	1	P>0.05	44	36	0.048	1	P>0.05
	Irregular	36	44				46	47			

The above table 20 depicts the post test association between demographic variables and Quality of Life (MENQOL) which revealed that there was no significant association between demographic variables and MENQOL in both Yoga and Non-Yoga groups of menopausal women. Hence the Null Hypothesis  $H_{06}$  there will be no significant association between selected demographic variables and quality of life in the pre and post test among Yoga and Non-Yoga group of menopausal women was accepted.

### Association between selected clinical variables with MRS:

The selected clinical variables namely BMI, Pulse rate, respiration rate SBP and DBP were associated with MRS in Pre and Post tests.

**Table. 21 Association between Clinical Variables and Menopausal Symptoms (MRS) of Yoga and Non-Yoga groups of Menopausal Women in the Pretest**

Clinical variable	Category	Yoga group (n=108)					Non Yoga group (n=120)				
		≤M	>M	$\chi^2$	df	Sig	≤ M	>M	$\chi^2$	df	Sig
BMI	<25	27	11	7.856	1	*P<0.01	28	14	0.000	1	P=1.00
	≥ 25	30	40				52	26			
Pulse rate	<80	18	15	0.060	1	P>0.05	27	13	0.019	1	P>0.05
	≥80	39	36				53	27			
SBP	<120	19	10	2.582	1	P>0.05	22	10	0.085	1	P>0.05
	≥120	38	41				58	30			
DBP	<80	18	15	0.060	1	P>0.05	29	13	0.165	1	P>0.05
	≥ 80	39	36				51	27			
Resp. rate	≤ 20	13	5	0.070	1	P>0.05	31	12	0.888	1	P>0.05
	> 20	44	46				49	28			
WC	≤88	23	3	17.496	1	**<0.001	18	13	1.392	1	P>0.05
	>88	34	48				62	27			

The data presented in table 21 shows that the BMI in the pretest has strong association with Menopausal Symptoms (MRS) with high level of significance at  $P < 0.01$  and  $P = 1.00$  in both Yoga and Non Yoga groups respectively. Waist Circumference also had a very strong association with Menopausal Symptoms showing statistically very high level of significance at  $P < 0.001$  and Yoga group of menopausal women. However there was no significant association between other clinical variables and menopausal symptoms. Hence the Null Hypothesis  $H_0$  there will be no significant association between selected clinical variables and menopausal symptoms in the pretest and post test of Yoga and Non-Yoga group was partially rejected.

**Table. 22 Association between Clinical Variables and Menopausal Symptoms of Yoga and non Yoga groups of Menopausal women with in the post test.**

Clinical variables	Category	Yoga group (n=108)					Non-Yoga group (n=120)				
		≤M	>M	$\chi^2$	df	Sig	≤M	>M	$\chi^2$	df	Sig
BMI	<25	45	9	6.646	1	P<0.01	22	16	0.034	1	P=1.00
	≥25	33	21				46	36			
Pulse rate	<80	42	16	0.002	1	P>0.05	14	2	5.772	1	P<0.05
	≥80	36	14				54	50			
SBP	<120	36	13	0.070	1	P>0.05	15	8	0.847	1	P>0.05
	≥120	42	17				53	44			
DBP	<80	65	20	3.591	1	P>0.05	13	13	0.601	1	P>0.05
	≥80	13	10				55	39			
Respiratory rate	≤20	48	15	1.157	1	P>0.05	18	17	0.552	1	P>0.05
	>20	30	15				50	35			
WC	≤88	27	6	2.181	1	P>0.05	13	15	1.559	1	P>0.05
	>88	51	24				55	37			

Table 22 portrays the association between clinical variables and the post tests MRS scores. BMI in Yoga group and pulse rate in non Yoga group had been associated with post test MRS(P>0.05). The normal BMI was associated with Less than median MRS and statistically highly significant (P<0.01). The normal pulse rate was also associated with less than median MRS and the association was statistically significant (P<0.05). Other variables did not show any association. Hence the Null Hypothesis Ho<sub>5</sub> there will be no significant association between selected clinical variables and menopausal symptoms in the pretest and post test of Yoga and Non-Yoga group was partially rejected.



**Table. 23**

**Association between Clinical Variables and MENQOL of Yoga and Non-Yoga groups of Menopausal women in the pre test.**

Clinical variables	Category	Yoga group (n=108)					Non Yoga group (n=120)				
		≤M	>M	$\chi^2$	df	Sig	≤M	>M	$\chi^2$	df	Sig
BMI	<25	25	13	5.183	1	P<0.01	21	21	0.000	1	P=1.00
	≥25	30	40				39	39			
Pulse rate	<80	15	18	0.569	1	P>0.05	16	24	2.400	1	P<0.05
	≥80	40	35				44	36			
SBP	<120	19	10	3.377	1	P>0.05	14	18	0.682	1	P>0.05
	≥120	36	43				46	42			
DBP	<80	15	18	0.569	1	P>0.05	23	19	0.586	1	P>0.05
	≥80	40	35				37	41			
Respiration rate	≤20	10	8	0.185	1	P>0.05	23	20	0.326	1	P>0.05
	>20	45	45				37	40			
WC	≤88	18	8	4.591	1	P<0.05	15	16	0.043	1	P>0.05
	>88	37	45				45	44			

Table 23 depicts the association of clinical variables with MENQOL in the pretest. BMI and Waist Circumference in Yoga group ( $P < 0.01$  and  $P < 0.05$ ) and Pulse rate in Non –Yoga group showed statistically significant association at  $P < 0.05$ . Other variables did not show any statistically significant association. Hence the Null Hypothesis  $H_{07}$  there will be no significant association between selected clinical variables and quality of life in the pretest and post test among Yoga and Non-Yoga group of menopausal women was partially rejected.

**Table.24 Association between clinical variables of Yoga and non Yoga groups with their MENQOL in post test.**

Clinical variables	Category	Yoga group (n=108)					Non-Yoga group (n=120)				
		≤M	>M	$\chi^2$	df	Sig	≤M	>M	$\chi^2$	df	Sig
BMI	<25	31	23	0.038	1	P>0.05	18	20	0.154	1	P>0.05
	≥25	32	22				42	40			
Pulse rate	<80	35	23	0.209	1	P>0.05	10	6	1.154	1	P>0.05
	≥80	28	22				50	54			
SBP	<120	28	21	0.052	1	P>0.05	13	10	0.484	1	P>0.05
	≥120	35	24				47	50			
DBP	<80	49	36	0.077	1	P>0.05	12	14	0.196	1	P>0.05
	≥80	14	9				48	46			
Respiratory rate	≤20	43	20	6.122	1	P<0.05	15	20	1.008	1	P>0.05
	>20	20	25				45	40			
Waist Circumference	≤88	22	11	1.358	1	P>0.05	12	16	0.745	1	P>0.05
	>88	41	34				48	44			

It can be inferred from table 24 that there is significant association between respiratory rate and Quality of Life (MENQOL) at  $p < 0.05$  level of significance in the post test among Yoga and Non-Yoga groups of menopausal women. Other clinical variables did not show any association. Hence  $H_0$  there will be no significant association between selected clinical variables and quality of life in the pretest and post test among Yoga and Non-Yoga group of menopausal women was partially rejected.

## **Section-7 Regression analysis of associated variables with MRS and MENQOL among Yoga and Non-Yoga group of Menopausal Women**

The independent demographic and clinical characters of both groups were associated with the MRS and MENQOL.

The variables which were associated were studied as follows by constructing equations:

Pretest Menopausal Symptoms (Yoga).  $MRS = 12.160 + 0.414 (BMI) + 0.010(\text{waist circumference})$ .

Post test MRS (Yoga).  $MRS = 3.007 + 1.144 (\text{nature of menstrual cycle before menopause}) + 0.347 (BMI) - 0.039 (\text{Pulse rate})$ .

Post MRS (Non-Yoga).  $MRS = 23.854 + 1.664 (\text{pre Nature of Menstruation before Menopause})$

Pretest MENQOL (Yoga).  $MENQOL = 119.320 - 0.041(BMI) + 0.304(WC)$

Pretest MENQOL (Non-Yoga).  $MENQOL = 152.326 - 0.045(\text{pulse rate}) - 0.611(\text{Nature of work})$ .

Post test MENQOL (Yoga).  $MENQOL = 35.708 + 1.068(\text{Respiration})$ .

**Table. 25**

**Standardised Multiple Regression in the Pretest Computed for Associated Clinical Variables BMI and WC with Menopausal Symptoms (MRS) for Yoga Group of Menopausal Women**

Predictor variables	Regression coefficient		Standardised Coeffts	Model Summary		ANOVA	
	B	S.E		R	R <sup>2</sup>	F	Sig.
	Constant	12.160	5.974				
BMI	0.414	.245	0.219	0.229	0.052	2.895	P>0.05
WC	0.010	.064	0.018				

Table 25 infers the predictive ability of associated clinical variables with menopausal symptoms (MRS) and is explained by regression co-efficient. BMI caused 41% variance (B = 0.414, R<sup>2</sup> = 0.052, F = 2.895) and Waist circumference did not predict. The two variables did not predict significantly with the pretest Menopausal symptoms (MRS) (p>0.05). Hence Hence the null hypothesis H<sub>08</sub> ‘the pretest and post test menopausal symptoms in Yoga and Non-Yoga group of menopausal women will not be significantly predicted by their associated clinical variables’ was partially rejected.

**Table .26**

**Standardized multiple regression in the post test computed for associated clinical variables (Nature of menstrual history before menopause, BMI and Pulse) with Menopausal Symptoms for Yoga group of menopausal women**

Predictor Variables	Regression coefficient		Standardized Coeffts	Model Summary		ANOVA	
	B	SE		R	R <sup>2</sup>	F	Sig.
	Constant	3.007	5.115				
Nature of menstrual cycle before menopause	1.144	0.597	0.187	0.298	0.089	3.372	P<0.05
BMI	0.347	0.131	0.252				
Pulse	-0.039	.061	-.064				

Table 26 infers the predictive ability of the associated clinical variables and is explained by regression co-efficient. BMI caused 34% variance ( $B = 0.347$ ,  $R^2 = 0.089$ ,  $F=3.372$ ) in the post test menopausal symptoms (MRS) among menopausal women. The above variables showed statistically significant difference at  $p<0.05$  with menopausal symptoms (MRS) in the post test for Yoga group of Menopausal Women. Hence the null hypothesis  $H_{08}$  'the pretest and post test menopausal symptoms in Yoga and Non-Yoga group of menopausal women will not be significantly predicted by their associated clinical variables' was partially rejected.

**Table 27**

**Standardized multiple regression in the pre test computed for selected clinical variables (BMI and Waist Circumference) with Menopausal Specific Quality of Life (MENQOL) for Yoga group of menopausal women**

Predictor Variables	Regression coefficient		Standardized Coeffts	Model Summary		ANOVA	
	B	Std Error		R	R <sup>2</sup>	F	Sig.
Constant	119.320	18.774					
BMI	-.041	0.770	-.006	0.169	0.029	1.545	P>0.05
WC	0.304	0.201	0.172				

Table 27 infers the predictive ability of the associated clinical variables (BMI and WC) with MENQOL. Waist Circumference caused 30% variance ( $B = 0.304$ ,  $R^2 = 0.029$ ,  $F = 1.545$ ) in the post test menopause specific quality of life (MENQOL) among menopausal women. The two variables did not predict significantly in the pretest with MENQOL ( $R^2 = 0.029$ ,  $F = 1.545$ ,  $P > 0.05$ ). Hence the Null hypothesis  $H_{09}$  'the pretest and post test quality of life in Yoga and Non-Yoga group of menopausal women will not be significantly predicted by their associated clinical variables' was partially rejected.

**Table 28**

**Standardized multiple regression in the post test computed for selected clinical variable (Respiration) with Menopausal Specific Quality of Life (MENQOL) for Yoga group of menopausal women**

Predictor variable	Regression coefficient		Standardized Coeffts	Model Summary		ANOVA	
	B	Std Error		R	R <sup>2</sup>	F	Sig.
	Constant	35.708	13.117				
Respiration	1.068	0.652	0.157	0.157	0.025	2.679	P>0.05

Table 28 infers the predictive ability of the associated clinical variable and is explained by regression coefficient. Respiration caused 106 % variance (B = 1.068, R<sup>2</sup> = 0.025, F=2.679) in the post test menopause specific quality of life (MENQOL).The clinical variable (respiration) did not predict significantly with the post test QOL P>0.05). Hence the Null hypothesis H<sub>09</sub> ‘the pretest and post test quality of life in Yoga and Non-Yoga group of menopausal women will not be significantly predicted by their associated clinical variables’ was accepted.

**Table. 29**

**Standardized multiple regression in the pre test computed for selected clinical variables (Pulse and Nature of work) with Menopausal Specific Quality of Life (MENQOL) for Non Yoga group of menopausal women**

Predictor variables	Regression coefficient		Standardized Coeffts	Model Summary		ANOVA	
	B	Std Error		R	R <sup>2</sup>	F	Sig.
	Constant	152.326	20.225				
Pulse	-.045	0.256	-.016	0.034	0.001	0.069	P>0.05
Nature of work	-.611	1.964	-.029				

Table 29 infers the predictive ability of the associated clinical variables and is explained by regression coefficient with MEN QOL. The two variables (Pulse and nature of work) did not predict significantly in the pretest with MENQOL ( $R^2 = 0.001$ ,  $F = 0.069$ ,  $P > 0.05$ ). Hence the Null hypothesis  $H_{09}$  ‘the pretest and post test quality of life in Yoga and Non-Yoga group of menopausal women will not be significantly predicted by their associated clinical variables’ was accepted.

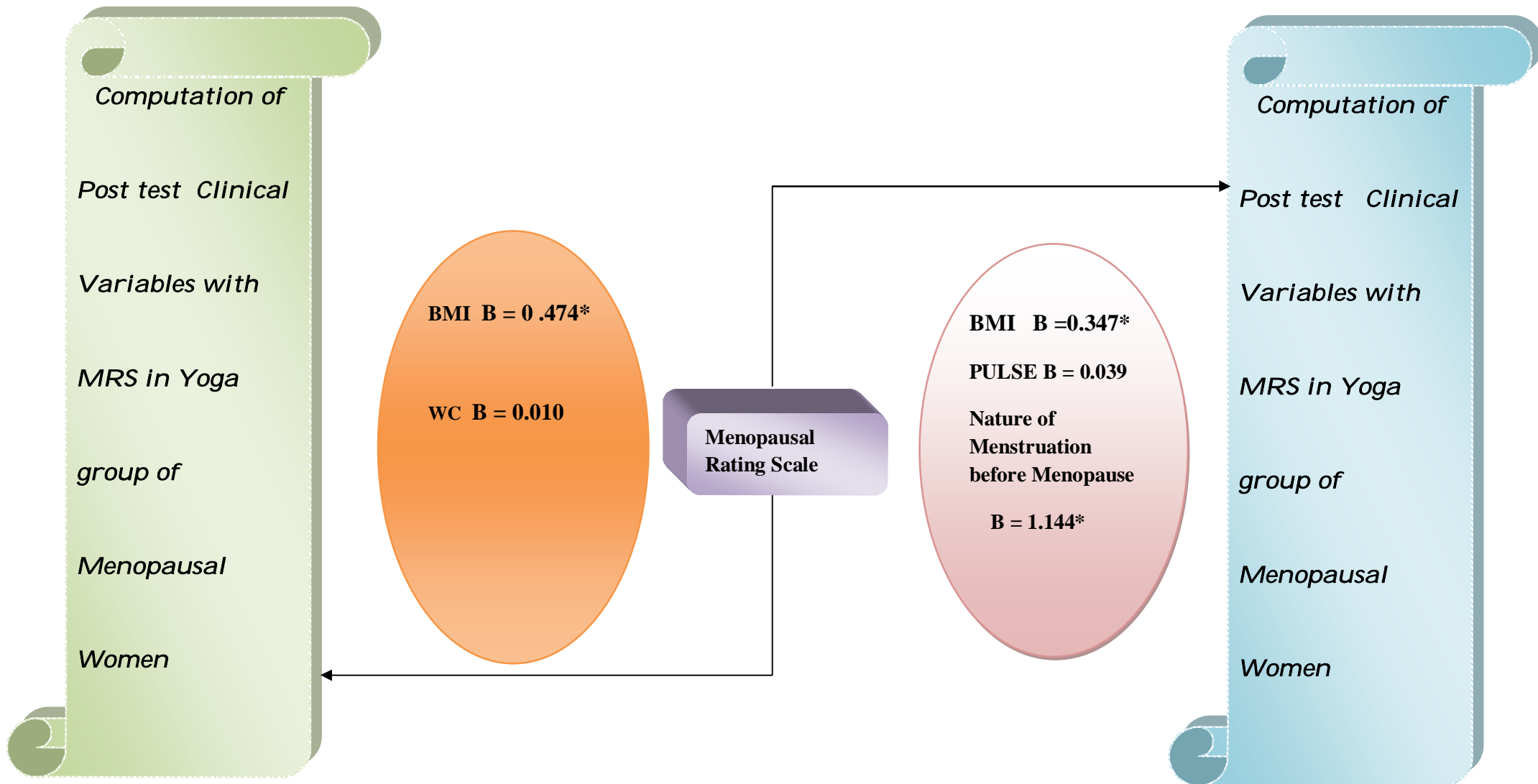


**Table 30**

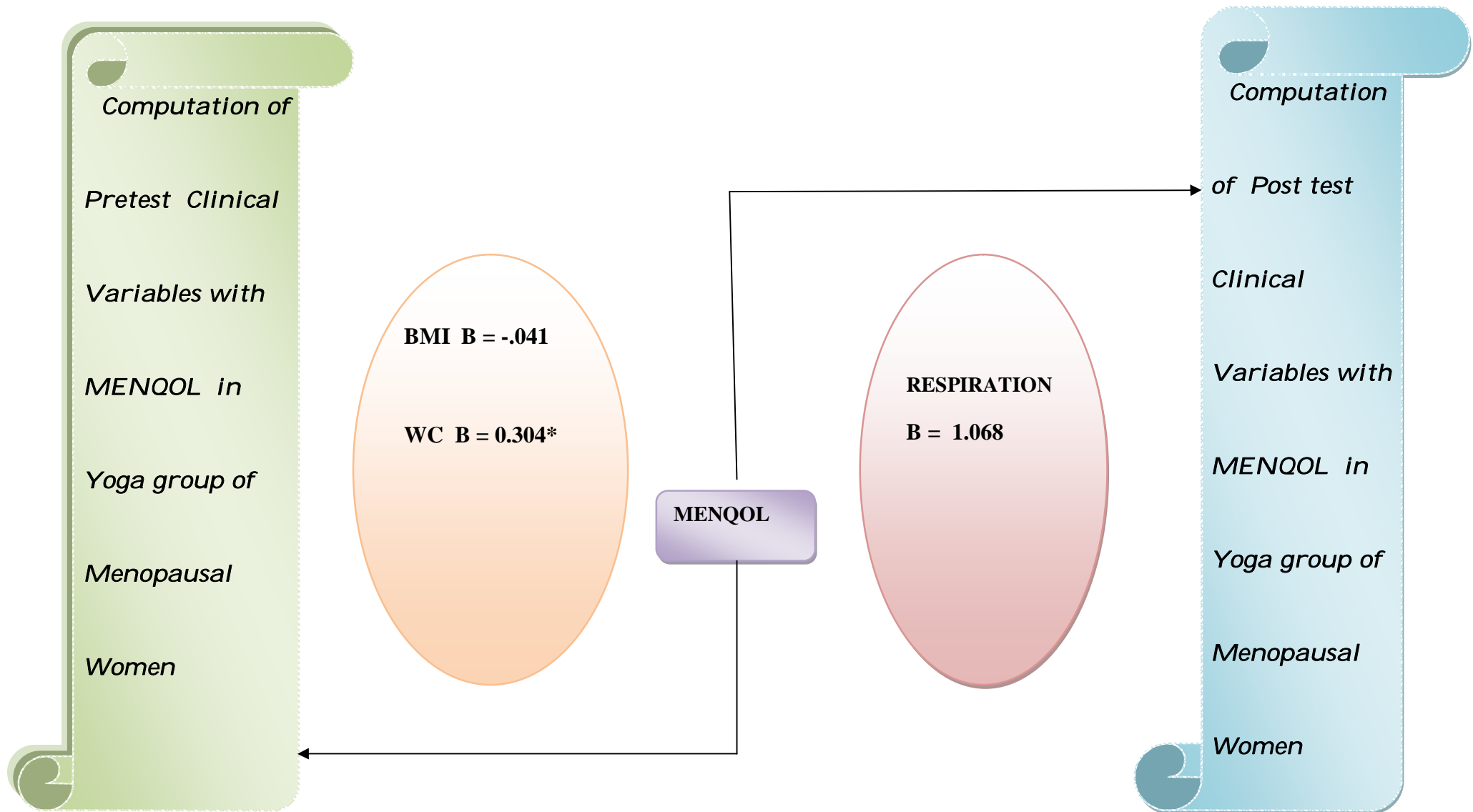
**Standardized multiple regression in the post test computed for associated clinical variable (Nature of menstrual cycle before menopause) with Menopausal Specific Quality of Life (MENQOL) for Non Yoga group of menopausal women**

Predictor variable	Regression coefficient		Standardized Coefft	Model Summary		ANOVA	
	B	S E		R	R <sup>2</sup>	F	Sig.
	Constant	23.854		1.250			
Nature of menstrual cycle before menopause	1.664	0.686	0.218	0.048	5.893	P<0.05	

Table 30 infers the predictive ability of the associated clinical variable and is explained by regression coefficient. The clinical variable (Nature of menstrual cycle before menopause) caused 166 % of variance (B = 1.664, R<sup>2</sup> = 0.048, F = 5.893) with the post test quality of life (MENQOL) among menopausal women. The above variable showed statistically significant difference at p<0.05 with menopausal symptoms (MRS) in the post test for Yoga group of Menopausal Women. Hence the Null hypothesis H<sub>09</sub> 'the pretest and post test quality of life in Yoga and Non-Yoga group of menopausal women will not be significantly predicted by their associated clinical variables was partially rejected.



**Fig. 15 Path Analysis for associated clinical variables and MRS with regression coefficients in the pre and post test Yoga group of Menopausal women**



**Fig . 16 Path Analysis for associated clinical variables and MENQOL with regression coefficients in Yoga group of Menopausal women**

## **SUMMARY**

This chapter explained the analysis of the data using descriptive and inferential statistics which clearly revealed the effectiveness of Yoga as a mind body intervention in reducing the menopausal symptoms in menopausal women. The clinical characteristics and menopausal symptoms facilitate and brings in a change in quality of life in the menopausal women through the Yoga. The succeeding chapter will discuss the findings of the study with supportive studies for better clarity.

*Chapter V*  
*Discussion*

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## **CHAPTER V**

### **DISCUSSION**

The aim of this community based study was to assess the effectiveness of Yoga upon menopausal symptoms in menopausal women at selected Primary Health Centres of Thiruvallur District, Chennai. The results of the research interpreted in the preceding chapter are discussed in this chapter in detail. The key focus here is to throw light on the changes seen in the Yoga group in terms of clinical variables and dependent variables. The analysis revealed the statistical significance of the effectiveness of Yoga administered as an intervention. The impact of Yoga was of benefit to the menopausal symptoms thus enhancing quality of life in the postmenopausal period.

**The objectives of the study were:**

1. To assess and compare the effect of Yoga on menopausal symptoms before and after administration of Yoga between Yoga and Non-Yoga groups of menopausal women.
2. To assess and compare the effect of Yoga on quality of life between Yoga and Non – Yoga groups of menopausal women.
3. To correlate menopausal symptoms with quality of life among Yoga and Non-Yoga groups of menopausal women
4. To find out the association of pre and post test menopausal symptoms with the selected demographic variables in Yoga and Non-Yoga groups of menopausal women.

5. To find out the association of pre and post test menopausal symptoms with the selected clinical variables in Yoga and Non -Yoga groups of menopausal women.
6. To find out the association of pre and post test quality of life with the selected demographic variables in Yoga and Non -Yoga groups of menopausal women.
7. To find out the association of pre and post test quality of life with the selected clinical variables in Yoga and Non-Yoga groups of menopausal women.
8. To determine the level of satisfaction regarding Yoga among Yoga groups of menopausal women.

**Keeping these objectives of the study in view, the results are discussed under the following headings:**

**Assessment of Demographic Characteristics of the menopausal women.**

In the present study, majority of the menopausal women are married and living with husband (85.2%, 85.8%), are homemakers (77.8%,77.5%), had mixed diet as their food habit (74.1% ,70.0%), are living in nuclear family (75.9%, 83.3%) & are Hindus (85.2%,74.2%) in the Yoga and Non-Yoga groups respectively. A significant percentage of menopausal women were primary and high school educated (44.4%, 40.8%), are moderate workers (51.9%, 55.9%), having family monthly income < 15,000 (47.2%, 40%), in the Yoga and Non-Yoga groups respectively.

The results were consistent with a recent PAN India survey of Indian Menopause Society by Ahuja et al (2016) which revealed that most of the menopausal women were married (93.1%), majority of them were homemakers (77.4%) and majority of them were Hindus (82.9%) and a significant percentage of them were taking mixed diet (45.4%). Similar results revealed in a study conducted by

Suramanjary (2016) which showed that majority of menopausal women were in nuclear family (68%) and a significant percentage of menopausal women were primary and high school educated (44%). The results were also similar to a study by Dutta et al (2012) conducted in rural Poonamallee block of Thiruvallur district which showed that majority of the menopausal women were married (86.2%).

With regard to marital status, as majority are married and living with spouse, it is understood that rural women are highly adjustable and tend to stand beside the male counterpart in their marital life. This shows that there is a phenomenal influence of presence of male in the household in the post menopausal period when compared to divorced and separated women. Women may also be able to share their sorrows and health problems to their spouses. This is the period their children are out of the family either for higher studies / job or get married. Menopausal women living with their spouse get time again to have a better understanding as they age.

Education to a greater extent empowers women and when a new knowledge or practice is attempted they tend to understand, accept and follow them eventually. Education helps them lead a quality life after the intervention by continuing the practice of Yoga. Where education is deficient, women in menopause may not be interested to practice Yoga, they may view it as a burden or pain.

House wives, being at home make them perceive the menopausal symptoms often, as they are not always engaged. Moreover at midlife as home makers they may feel lonely. At the same time, there is opportunity for them to socialise, share their views with their spouse, and with neighbourhood.

Their nature of work and activity also contributes to the menopausal symptoms. Menopausal symptoms like joint pain and muscular pain set in due to



decreased activity. In the midlife, women gain weight and hence they may refrain from day to day activities. Those who already were able to carry out some work were able to perform Yoga with flexibility and as Yoga is executed in groups, menopausal women who perform Yoga influence others who lack flexibility.

Consumption of mixed diet helps us understand that there is calcium intake through sea foods like fish, milk and others. On the contrary, taking mixed diet can put the menopausal women at risk for obesity and drop in oestrogen also has the tendency to cause weight gain.

As majority of the menopausal women are now living in nuclear families, the experience of 'empty nest syndrome' adds fuel to fire. Children going abroad (or) for higher studies or get married leave a caring mother all alone in her nest to suffer. This could be contributing to loneliness, anxiety and depression. In nuclear families, they need to carry out all their household chores by themselves eventually giving rise to physical and mental exhaustion, sleep disturbances and inner restlessness. Whereas in joint families, the work load is shared by others in the family. Moreover they have people in the family to socialise. On the contrary, nuclear family may also facilitate the menopausal women to take rest when they need and even help her schedule time to practise Yoga at home. A woman has privacy to modify or manage her routines in nuclear families.

Although many Hindus opted to be part of the study, the Christians did show interest in learning and practicing Yoga and were part of the study. The reason might be that Yoga has its roots in India and hence they might have shown preference to it. Moreover the overall health benefits of Yoga are proven world wide as even the

Westerners practise it. Above all, Yoga is found to be safe and effective way of managing menopausal symptoms when compared to hormone replacement therapy.

In the present study, the mean age at natural menopause was  $46.9 \pm 4.0$  years and  $47.0 \pm 3.5$  years in the Yoga and Non-Yoga groups of menopausal women respectively. Similarly, the mean current age was  $52.9 \pm 6.3$  and  $52.8 \pm 6.2$  and duration of menopause was ( $6.1 \pm 5.2$  and  $5.9 \pm 5$ ) in the Yoga and Non-Yoga groups.

This result was consistent with the findings in the PAN India survey by Ahuja et al (2016) which elicited the mean age at natural menopause at South India as  $46.1 \pm 5.63$ . Yet another community based study by Dutta et al (2012) was conducted in the rural population in the Poonamallee block of Thiruvallur District which is also the district under study in the present research work. The mean age at menopause was 44.49 years and the mean current age of the menopausal women was 50.20 years.

Previous studies have also noted that married and widowed women report a later mean age at natural menopause compared to single and divorced women ( $P < 0.05$ ). A phenomenal influence of male in the household has been considered to be a possible reason for this variation in menopausal age.

It is obvious that menopausal women in this study have attained natural menopause at more or less the right age in both Yoga and Non-Yoga group. This also shows that there is no evidence of early or delayed menopause in the study indicating normal physiological process. Menopause is a period of transition in every woman's life regardless of their social and economical status. Menopause is also a milestone event in a woman's life however there is no celebration for menopause.

The duration of menopause is obtained by subtracting current age with age at natural menopause. Thus the present study indicates that all women were in postmenopausal period from early to late post menopause. The menopausal symptoms were clearly evident at these stages. It was not so difficult for the researcher to convince the menopausal women to practice Yoga and thereby reduce the symptoms although there was reluctance initially with regard to venue and time.

### **Assessment of the Clinical variables in both the Yoga and Non- Yoga groups of menopausal women**

In the current study, majority of them had irregular menstrual cycle before menopause (74.1%, 77.5%), consumed coffee / tea (64.8%, 66.7%), all of them had normal breast examination findings (100%, 100%), most of them had no Fracture History (94.4%, 94.2%), and a significant percentage of the menopausal women had diabetes (37.0%, 37.5%) in the Yoga and Non- Yoga groups respectively.

The results were consistent with a community based cross sectional study by Dutta et al (2014) conducted in 780 postmenopausal women to observe the influence of chronic health problems on menopausal symptoms. The results revealed that 35% of menopausal women were known cases of diabetes.

The menstrual cycle gets irregular before menopause due to the role of hormones. The hormone levels swing in and out of the normal range in perimenopause as they are determined by the condition of the particular follicle that matures each month. If the woman happens to release a healthy egg, her circulatory oestrogen, progesterone, FSH, LH and inhibin levels will be normal; if the woman happens to release a wornout egg, her hormone levels will be in the perimenopausal range,.

Intake of high caffeinated beverages may predispose to cortical bone loss from the proximal femur. Some studies have suggested that coffee consumption is significantly associated with increased risk of osteoporosis and osteoporotic fracture. Recently, a large and long term epidemiological study published by Sweden suggested that high coffee consumption was associated with a small reduction in bone density. Therefore, to reduce the risk of osteoporosis, it is wiser to reduce the caffeine consumption in menopausal women. One reason drinking cola (or) coffee could impact bone density is that drinking more of these beverages means that the individual drinks less beverages like milk that do promote bone health. In the present study majority (64.8%, 66.7%) were consuming coffee / tea which infers that there is risk of osteoporosis to these menopausal women. In southern part of India, it has been a regular practice to feed children with milk and adults are used to taking coffee or tea according to their preferences. The impact of coffee / cola on health could be also highlighted on educational activities so that women right from younger age can take precautions.

A significant percentage of women in the study suffer from diabetes and hypertension. This could be attributed to hormonal fluctuations in perimenopause. Women are gifted with the protection of various organs/ system by oestrogen. When the oestrogen levels tend to drop, they begin getting co-morbid conditions like diabetes and hypertension. Hence education on lifestyle modification would be the choice to delay the occurrence of morbidities.

In the present study the mean values of clinical (continuous) variables such as Water intake in litres ( $1.9 \pm 0.41$ ,  $1.9 \pm 0.4$ ), Height in cms ( $156.2 \pm 5.7$ ,  $156.2 \pm 5.6$ ), weight in kg ( $63.0 \pm 6.8$ ,  $63.0 \pm 6.6$ ) BMI ( $25.8 \pm 2.2$ ,  $25.8 \pm 2.1$ ), Waist Circumference in cms ( $95.0 \pm 8.2$ ,  $94.8 \pm 8.1$ ), Pulse ( $82.2 \pm 5.3$ ,  $81.6 \pm 5.0$ ), Systolic

Blood Pressure ( $124.2 \pm 14.5$ ,  $123.6 \pm 13.4$ ) Diastolic Blood Pressure ( $80.6 \pm 8.4$  ,  $80.0 \pm 8.2$ ), Respiratory rate/mt ( $22.3 \pm 1.6$ ,  $21.9 \pm 1.1$ ), Menopausal Symptoms – Somatic symptoms ( $9.2 \pm 2.2$  ,  $9.4 \pm 1.8$ ), psychological symptoms ( $10.4 \pm 1.9$ ,  $10.4 \pm 1.8$ ) and urogenital symptoms( $6.1 \pm 1.9$ ,  $6.4 \pm 1.4$ ) and menopause specific quality of life ( $147.1 \pm 14.5$ ,  $147.5 \pm 13.9$ ). Pre test means had been compared between the Yoga and Non-Yoga groups for homogeneity.

A study done by Peter Chedraui et al in Latin America showed that obese post menopausal women were found to have more severe menopausal symptoms than non obese. Similar findings were reported in a pilot study conducted on 50 menopausal women by Agarwal et al (2015) in a tertiary care hospital which revealed the mean height as  $156.3 \pm 5.3$ ,  $157.28 \pm 4.7$  in cms, the mean weight  $62.3 \pm 6.0$ ,  $62.08 \pm 8.6$  in kgs, and the mean BMI  $25.6 \pm 3.0$ ,  $25 \pm 2.7$  in  $\text{kg/m}^2$ .

According to World Health Organisation, in 2008, more than 1.4 billion adults were overweight. Of these over 200 million men and nearly 300 million women were obese. Studies show excess adipose tissue, mostly central, is associated with high cardiovascular morbidity and mortality. Diverse methods have been used to assess the amount and the distribution of body fat. One such anthropometric parameter is BMI. Others are Waist Circumference (WC) and Waist-Hip Ratio (WHR) which have the advantages in the daily clinical / community practice of being simple to measure with good reproducibility, especially in a developing country like India. Though BMI reflects lean mass and fat, it scarcely identifies the distribution of fat. Hence in addition, the Waist Circumference is checked. WC is being increasingly accepted as the best anthropometric indicator of abdominal adiposity and metabolic risk.

A trend of increasing BMI and waist line has been observed as the age of the woman increases. This fat accumulation could be due to hormonal changes and decreased activity levels. Women with higher BMI are supposed to have higher levels of estradiol (E<sub>1</sub>) and oestrone (E<sub>2</sub>) in their body, leading to delayed menopause. The findings of a PAN India study on age and determinants of menopause by Ahuja et al (2016) showed that lower BMI is associated with earlier onset of menopause (P = 0.002).

Although some literature and studies state that there is some amount of reduction of height in menopause and thereafter due to osteoporosis. The researcher did not measure the height in the post test and the height measured in pretest was considered for calculating BMI in the pretest and post test as within six weeks of intervention change in height was not expected.

Pulse, respiration and blood pressure are the clinical parameters assessed in the pretest understanding the impact of Yoga on pulse, respiration and blood pressure. The present day lifestyle tends to elevate the blood pressure, as women face more and more challenges today. Added on to this the hormonal changes in perimenopause can have an affect. Stress, anxiety and mood changes can very easily cause variations in the respiratory rate, blood pressure and pulse. In working women, pressure in the work place and inability to balance personal and professional life contributes significantly. When menopausal women are not able to perform their activities as expected, they arrive at physical and mental exhaustion and depression.

**Assessment of the effect of Yoga on the clinical variables in Yoga and Non-Yoga groups of menopausal women.**

Majority of the menopausal women were overweight in the pretest (61.1%, 61.7%) in the Yoga and Non-Yoga groups respectively whereas in the post test 50% were overweight and 50% were in normal BMI range respectively in Yoga group as compared to Non-Yoga group. Majority of them had high pulse rate in the pretest (69.5%, 66.7%) in the Yoga and Non- Yoga groups respectively and in the post test almost 48.1% had normal pulse and 46.3% had high pulse rate in the Yoga group.

Majority of them had SBP of 120-130 mm of Hg in the pretest (55.6%, 57.5%) in the Yoga and Non-Yoga groups respectively. In the post test, 46.3% had SBP of 120-130mm of Hg and 45.4% had SBP of less than 120 mm of Hg. This shows a significant reduction of SBP in Yoga group. With regard to Non-Yoga group, most of them (65.8%) had SBP of 120-130 mm of Hg in the post test. Majority of the menopausal women in the Yoga group (pretest) had DBP of 80-90 mm of Hg (54.6%) and high DBP 14.8% where as in the post test 78.7% had DBP of less than 80 mm of Hg, 21.3% had DBP of 80-90 mm of Hg and none had high DBP. This shows a significant reduction of DBP in Yoga group. In the Non- Yoga group 36.6% had high DBP in the pretest whereas 26.6% had high DBP in the post test.

Majority of them in the pretest had respiratory rate above 20/mt (83.3%, 64.2%) in the Yoga and Non-Yoga groups respectively. Whereas in the post test 58.3% had normal respiratory rate in the Yoga group as compared to 29.1% in Non-Yoga group. This shows a reduction in the scores of respiratory rate in Yoga group. Majority of the menopausal women's waist circumference were in high risk category in the pretest (75.9%,74.2%) in Yoga and Non-Yoga groups respectively as

compared to their post test waist circumference in the high risk category (67.6%, 76.7%) in Yoga and Non-Yoga groups respectively.

There was reduction in BMI in the Yoga group of menopausal women in the post test when compared to Non-Yoga group. Reduced BMI in Yoga group could be due to the regular practice of Yoga for six weeks. This has made them more flexible. The menopausal women felt light in their body and experienced ease in performing daily activities. Yogasanas like Pavanamuktasana, Bhujangasana, Salabasana, Udhana padhaasana and Padhahastasana would have helped in a phased manner to reduce BMI. In Yoga group of menopausal women BMI reduced slowly and steadily without leaving any strain in the subjects. Yoga being an alternative therapy tends to improve the health status of menopausal women by controlling weight gain, Yoga works on ligaments, muscles and joints through performance of slow non jerky movements which strengthen them scientifically and energises the individual. Yoga does not make a person tired mostly as there is cool down postures before completion of any Yoga session.

Waist circumference was measured at the iliac crest using an inch tape. Reduction in waist circumference was observed after the post test in Yoga group compared to non- Yoga group of menopausal women. Waist line is reduced by consistently practising asanas like Ardhakadi chakrasana, Januseerasana and Utiana bandha. Apart from these, warm up also helps.

Menopausal women experience sleep problems, depressive mood, irritability, heart discomfort, anxiety, physical and mental exhaustion. These symptoms are subjective in nature and hence assessment of respiratory rate, blood pressure and pulse rate will help have a better understanding. The reduction / changes in pulse rate,



respiratory rate and blood pressure observed in this study could be indicative of the positive effects of selected practices like Pranayama, Dhyana and Shanthiasana. Moreover Yogasanas work on the mind and body unlike exercise.

### **Assessment of the prevalence of menopausal symptoms in Yoga and Non-Yoga groups of menopausal women: Somato-vegetative symptoms, psychological symptoms and urogenital symptoms**

In the present study the mean values of Menopause Rating Scale in somatic domain of Yoga group before Yoga was  $9.2 \pm 2.2$ . The mean psychological domain of Yoga group before Yoga was  $10.4 \pm 1.9$ . The mean urogenital domain of Yoga group before Yoga was  $5.9 \pm 2.1$ . The mean total menopausal symptoms of Yoga group before Yoga was  $25.4 \pm 4.7$ . With regard to prevalence majority of them had severe (63.9%) somatic symptoms, majority of them had severe (62.1%) psychological symptoms and only significant of them experienced severe (36.1 %) urogenital symptoms.

Similar study was conducted by Abou – Raya et al to determine the frequency and determinants of severity of menopausal symptoms among 540 Egyptian women using the Menopause Rating Scale. Most frequently reported symptoms were joint and muscular discomfort (92.8%) which is one of the somatic symptoms, followed by urogenital symptoms (85.2 %).

Menopause another physiological state in the life of a woman can be extremely symptom producing. Menopause is not a disease, but it does have a serious clinical sequel. It is the time that challenges gynaecologists and nurses. Menopausal symptoms are somato-vegetative, psychological and urogenital in nature. The somato-vegetative symptoms are hot flushes, heart discomfort, sleep problems and joint and muscular discomforts. The psychological symptoms are irritability, anxiety, physical

and mental exhaustion and depressive mood. urogenital symptoms are sexual problems, bladder problems and dryness of vagina.

Historically, many women did not experience menopause or much of postmenopausal life before death. Currently with the life expectancy for women at more than 80 years, menopause is no longer associated with the end of a woman's life. Actually, many women will spend approximately one-third of their lives postmenopause. During a woman's life, her body undergoes many changes. Hormones govern changes starting with menarche, through puberty, and into her adult life. These functional changes are brought about by hormonal alterations that will result in the physiological changes and consequences.

Estrogen is produced by the ovaries in various forms (estriol, estrone, and estradiol). The ovaries also produce progesterone. Regulation of the menstrual cycle occurs due to the progesterone along with hormones released from a structure in the brain called the pituitary gland. The pituitary is activated to release Follicle-Stimulating Hormone (FSH) and Luteinizing Hormone (LH) in a cyclic fashion by a control centre of the brain, the hypothalamus. FSH functions as its name suggests, stimulating follicular growth, or in the other words signalling the growth of a group of cells that surround a developing egg (out of approximately 500,00 potential immature eggs). An increase in the LH in the blood then provides hormonal information to the ovaries to release that egg (ie., ovulation occurs). This monthly pattern of development of a follicle and the release of an egg happens over and over throughout a woman's reproductive life. The rise and fall of all these hormones (FSH, LH, estrogen and progesterone) provide for menses each month, unless pregnancy occurs or other health related concerns interrupt this orchestration. The hypothalamus acts as

a conductor, signaling the pituitary gland and the ovaries in a rhythmic fashion that repeats each month.

During perimenopause, the precise monthly rhythm of hormones become less regular. Hormone levels begin to change as the ovaries decrease in size. As menopause ovaries, the follicles in the ovaries are no longer able to respond to the stimulus from FSH and LH, so estrogen (most specifically estradiol) levels drop and progesterone release is basically zero. The main type of estrogen remaining after menopause is estrone, which is a weaker form of estrogen. Estrone is produced within fat tissue and will increase with age and with the amount of fat in the body. Thus just as at puberty, hormone changes bring about continued physical changes during menopause.

Hot flashes appear to be one of the first signs of perimenopause and may continue for two years into postmenopause (possibly longer for some women). The increase and perception of heat within the body is a hot flash. The feeling of heat can be in the upper part of the body (face, neck, and upper torso). Hot flashes are accompanied by perspiration. When this occurs during sleep, it is night sweat.

Heart discomfort (unusual awareness of heart beat, heart skipping, heart racing, tightness). Estradiol (the active type of estrogen plays a major role in the way lipids are produced, managed, broken down and eliminated from the body. Estradiol also seems to help dilate the blood vessels and keep them from having spasms. This may be one of the reason that women are prone to cardiovascular problems after menopause.

It is well known that estrogen increases the level of good cholesterol (HDL) in the blood, and lowers the level of bad (LDL) cholesterol. Presence of estrogen in the form of natural estradiol protects the cardiovascular system. In menopause, as the estrogen level comes down, the heart tends to lose its protection. Women often underestimate the heart discomforts or don't realise that the chest symptoms are due to heart problems; therefore they play down the symptoms.

**Sleep problems:** Women tend to sleep less as they reach menopause. They either have difficulty falling asleep or difficulty in sleeping through or they wake up early. These sleep problems progress as age advances. Night sweats, another issue wakes her up from the bed and after which she finds it difficult to sleep.

**Muscular discomforts:** Women in midlife encounter joint and muscular discomforts. Muscle is an active tissue so it consumes energy. There are fast and slow-twitch muscle fibers. The fibers that specialize in rapid movements and lifting heavy objects are called fast-twitch. Though they can move fast, they also become fatigued very quickly. Whereas slow-twitch, contract more slowly, but they are capable of working for a long time. The soleus muscles in the back of the calves and other muscles used all day to maintain balance and posture, consist mainly of slow-twitch fibers. One reason for becoming less capable of rapid movement as one gets older is that the proportion of fast-twitch fibers in our body declines. Activities improve the performance of fast-twitch fibers, regardless of age.

**Joint discomforts and Osteoporosis:** Osteoporotic changes are common in menopause. The process, called remodelling is the work of two kinds of cells- osteoclasts and osteoblasts. Osteoblasts which break down damaged bone, releasing calcium into the blood. Osteoclasts draw calcium from the blood and create new bone.

Remodeling is affected by three important factors, i) estrogen and other hormones – estrogen restrains the bone dissolving activity of the osteoclasts. The brakes let up after menopause, when the ovaries produce less estrogen. The osteoblasts keep building, but their efforts are outdone by the out-of-control osteoclasts. So there is a net loss of bone. (ii) Calcium supply and demand – Calcium is essential to many of the body's behind-the-scenes chemical reactions – its needed for muscles to contract, to regulate blood pressure and to control bleeding. If enough calcium is not obtained from diet, body is forced to draw on the supply stored in your bones. (iii) mechanical forces – physical impact stimulates bone formation. That's why walking is a better exercise than swimming. And Yoga also is a better option. The tug of muscle against bone works the same way. This is one reason that strength training and Yoga affects bone density. And the stronger the muscles, the more stimulation they provide.

**Assessment of the effect of Yoga upon domain wise menopausal symptoms and total menopausal symptoms in Yoga and Non-Yoga groups of menopausal women**

In the present study, most of the women had severe somatic symptoms (63.9%, 66.7%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (61.1%) of them experienced mild somatic symptoms and significant (34.3%) of them experienced moderate level of somatic symptoms after post test in the Yoga group.

Most of the women had severe psychological symptoms (62.1%, 65.8%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (70.4%) of them experienced mild psychological symptoms and significant (29.6%) of them

experienced moderate level of psychological symptoms after post test in the Yoga group.

Most of the women had moderate urogenital symptoms (42.6%, 48.3%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (71.3%) of them experienced mild urogenital symptoms and significant (21.3%) of them experienced moderate level of urogenital symptoms.

Coming to total menopausal symptoms, most of the women had severe menopausal symptoms (71.3%, 82.5%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (72.2%) of them experienced mild menopausal symptoms and significant (27.8%) of them experienced moderate level of menopausal symptoms after post test in the Yoga group.

Findings were similar in a study by Jorge et al (2016) which showed statistically lower scores for menopausal symptoms, stress levels and depression symptoms, as well as significantly higher scores in quality of life when compared to control and exercise groups. Only control group presented a significant increase in cortisol levels. The Yoga and exercise groups showed decreased levels of FSH and LH when compared to control group.

Favourable results were observed in a study conducted by Joshi et al (2011) where the total MRS scores in both the study group and control group were high on day 1; mean total score of 9.37 + 7.28 in the study group and 9 + 6.76 in the control group, but on day 90 the mean score was significantly less ( $P < 0.001$ ) in the study group (4.36 + 4.8) compared with the control group (9.2 + 6.72).

Findings were similar in a study by Buchanan et al where in Baseline values of the primary sleep measures for the entire sample were mean total sleep time (TST) =  $407.5 \pm 56.7$  min; mean wake after sleep onset (WASO) =  $54.6 \pm 21.8$  min; mean CV for WASO =  $37.7 \pm 18.7$  and mean CV for number of long awakenings > 5 min =  $81.5 \pm 46.9$ . Changes in the actigraphic sleep outcomes from baseline to weeks 11-12 were small, and none differed between groups. In an exploratory analysis, women with baseline Pittsburgh Sleep Quality Index higher than 8 had significantly reduced TST-CV following Yoga compared with usual activity.

Women spend approximately one-third of their lives postmenopause. The main purpose of Yoga intervention is to help them lead an active and healthy life during perimenopause and continuing into postmenopause.

Somato-vegetative symptoms: A smaller temperature change will cause the body to try to cool itself by dilating blood vessels in the skin, resulting in flushing and perspiration. Menopausal women who performed Yoga regularly have reported fewer and less severe hot flashes than did Non-Yoga group of menopausal women. Studies also suggest that those with higher physical activity levels had fewer hot flashes than did less physically active women. Therefore the amount of activity might be important. Also relaxation techniques are beneficial. In cool down Yoga, menopausal women performed Nadishuddhi Pranayama, Sheethali Pranayama, Dhyana and Shanthi asana which appears to potentially reduce the frequency of hot flashes by slow deep breathing from the abdomen (paced respiration). Sheethali Pranayama, being a body coolant Pranayama is known to produce tremendous benefits on the body and mind.

Heart discomfort : women experiencing symptoms of heart discomfort could manage them by following Yoga techniques like Warm ups, Asanas and Cool down.

Yoga allows the heart to slow down in a controlled manner, helping to avoid negative changes in the heart rhythm. Yoga prevents sudden drop in blood pressure, which can occur when activity is stopped abruptly, unlike exercise. The cool down Yoga techniques slowly return the body to preexercise levels as observed with breathing frequency and heart rate. In the current study, the reduction of heart discomfort is evidenced by practising Nadishuddhi Pranayama, Sheethali Pranayama, Dhyana and Shanthiasana. The cool down is the finishing touch to complete Yoga.

Sleep problems : Sleep disturbances progress as age advances in menopause. Yogasanas like Balasana, Makarasana, Shanthiasana, Pranayama and Dhyana can help manage the sleep related problems in menopausal women. These Yoga techniques promote sleep by relaxation response. Regular and sustained practise could make changes in the sympathetic nervous system. Stress is relieved and therefore mind gets quiet and calm resulting in peaceful sleep with less or no interruptions. Stress is reduced as Yoga like Nadishuddhi Pranayama clears the blockage in pranic flow. Sheethali Pranayama cools the whole body and purifies the blood thereby promoting rest and sleep. Dhyana or Meditation increases calmness of mind, steadiness which controls anxiety and inner restlessness and mood changes. Shanthiasana gives rest to the whole body, also gives a sense of well being and rejuvenates the body and mind.

Warm ups and Yogasanas like hand and leg stretches, asanas, work on the ligaments, muscles and joints through slow non jerky movements scientifically . They alleviate muscular and joint discomforts when initiated and performed earlier.

Psychological Symptoms : Yoga works on various psychological symptoms like depressive mood, irritability, anxiety, physical and mental exhaustion. Psychologically, when an individual is chronically stressed he or she is prone to



emotions such as tearfulness, anxiety, depression, anger and even feeling aggressive. Stress can interfere with the release of Luteinizing Hormone (LH) and Follicle Stimulating Hormone (FSH), which can affect the release of eggs and ultimately alters the menstrual cycle. The relaxation response is a powerful tool in its ability to make people feel better and it is found that women experiencing menopausal symptoms are greatly relieved when they begin a regular practise of Yoga. Women in menopause feel better when they quiet their minds and their bodies. Eliciting Relaxation Response through Yoga quiets the sympathetic nervous system. Heart beat and breathing returns to normal. Oxygen consumption decreases and blood flows more easily throughout the body.

Electrical activity of the brain also changes during Yoga. Electro Encephalo Gram readings, which record brain wave activity, show that the Relaxation Response like Dhyana, Pranayama and Shanthiasama increases the frequency and intensity of alpha and theta slow brain waves in the cerebral cortex, the site of higher mental functions. These type of brain waves are associated with a calm yet alert state of mind. When deep slow breathing is practised, it relaxes the muscles and rewires the brain. According to British Psychological Society, Yoga involves concentration on the breath and body, which makes it a great way to soothe a person's mind and relieve tension, inner restlessness and worries. Yoga poses, Pranayama, Meditation and Shanthiasana keep a person from such negative elements by helping the person discharge tension and stress. Pranayama detoxifies and oxygenates the entire body. As a result, a person who does Yoga is better able to achieve psychological health.

Urogenital Symptoms : The Urogenital symptoms are sexual problems, bladder problems and dryness of vagina. Sexual problems include change in sexual desire, in sexual activity and satisfaction. Good health, a loving relationship, an

available partner and positive attitudes about sex are crucial to sexual satisfaction and sexual desire. Intimacy and comfort with the partner largely determine why, how and whether the menopausal women respond in a sexual setting. Learning to express her needs to the partner, exploring new ways of communicating sexually, and improving intimacy all help to keep sex great at any age. Interpersonal stress and the effect of daily hassles can make sexual problems worse. Cool down Yoga techniques like Pranyama, Dhyana, shanthiasana can help a menopausal women to reduce stress and relax.

Bladder problems include difficulty in urinating, increased need to urinate and bladder incontinence. The estrogen level comes down in menopause resulting in bladder problems. Yoga techniques which work best for bladder related complaints are Januseerasana, Utianabandha, Udhana Padhasana, Salabasana and Padahasthasana. Utiana bandha is a great boon for menopausal women with urinary incontinence of varying degrees. This asana regulates urinary and anal sphincter control thereby preventing urgency, stress urinary incontinence. When the stress levels and depressed mood are brought down through Pranayama, Dhyana and Shanthiasana the menopausal women will be relaxed and ready to perform the advanced form of asanas, Januseerasana and Utianabandha.

### **Assessment of the effect of Yoga on quality of life in Yoga and Non- Yoga groups of menopausal women**

In the current study Menopause specific quality of life is determined by the following findings: Most of the menopausal women were under the category menopausal symptoms – bothered great extent (88.0%, 90.0%) in the pretest in Yoga and Non- Yoga group respectively. Whereas majority (63.0%) of them were having

menopausal symptoms- not bothered and significant (37.0%) of them had menopausal symptoms-bothered to some extent after post test in the Yoga group.

The effect of Yoga on MENQOL within the Yoga and Non-Yoga groups are discussed as follows: The mean MENQOL before Yoga of Yoga group was  $147.1 \pm 14.5$  and after Yoga was  $57.0 \pm 15.1$ . The mean reduction was  $90.1 \pm 12.8$  and the same was statistically very highly significant ( $P < 0.001$ ). The mean MENQOL before Yoga of Non-Yoga group was  $147.5 \pm 13.9$  and after Yoga was  $140.5 \pm 13.1$ . The mean reduction was  $7.0 \pm 4.9$  and the same was also statistically very highly significant ( $P < 0.001$ ).

Yoga eases most of the symptoms thus contributing to the overall improvement of quality of life. Group practice of Yoga might have an influence in enhancing the psychological well-being thereby contributing to health promotion and specific protection. Yoga showed significant effect in managing the vasomotor domain. This domain included hot flushes, night sweats and sweating, all the three symptoms showed a significant reduction in the Yoga group. Yoga was rewarding since vasomotor domain symptoms are difficult to manage and affects the overall quality of life.

Bener and Falah (2014) assessed menopause specific quality of life in their study with the most frequent symptoms reported as aches in the back and neck (49.2%), night sweat (37.2 %), low back ache (35.7%), feeling nervous (35.4%) followed by aches in the muscles / joints (34.6%), hot flushes (33.3%) difficulty sleeping (28.9%) and mood swings (25.4%).

Results were consistent with a similar study by Nayak et al, the within the group effect of Yoga therapy showed a significant decrease ( $P < 0.001$ ) in the mean scores of all the domains, whereas control group showed a significant decrease ( $P < 0.001$ ) only in physical and psychosocial domains. The 'effect size' was greater in Yoga therapy group in all domains compared to the control group. The overall quality of life is measured by the means of overall scores of each of the domains and Yoga therapy group showed a very significant improvement ( $P < 0.001$ ) compared to control group.

#### **Correlation of pre and post test menopausal symptoms with quality of life in Yoga and Non- Yoga groups of menopausal women.**

The current study portrays the relationships between the domains of MRS and MENQOL of Yoga and Non- Yoga groups in pre and post tests. In the Yoga group, the pretest MRS domains namely somatic, psychological and urogenital were correlated with respective MENQOL domains and they were positively correlated ( $P < 0.001$ ). There is positive correlation between somatic domain of MRS and the MENQOL (vasomotor and physical domain) 0.409, psychological domain of MRS and MENQOL (psychosocial) 0.225, urogenital domain of MRS and MENQOL (sexual) 0.512 in the Yoga group after the intervention when compared to the Non-Yoga group. The post test Yoga group domains determined as 16.7%, 5.1% and 26.2% respectively. In the Non-Yoga group, the pre MRS domains namely somatic, psychological and urogenital were correlated with respective MENQOL domains and they were positively correlated except Psychological domain ( $P < 0.001$ ).

The findings were unswerving with a study by Suramanjary (2016) which depicted correlation between menopausal symptoms and quality of life as highly

positive correlation ( $r = 0.8850$ ). Yet another study by Abou – Raya et al showed a positive correlation between menopausal symptoms and body mass index ( $r = 0.544$ ,  $P = 0.006$ )

The present study well documented the presence of various menopausal symptoms affecting the quality of life of menopausal women. Women in this mid life were found to have lost hope in managing these symptoms. They expressed that illnesses set in menopause affecting day to day activities and health. These women required a simple cost effective strategy for menopausal symptom relief. The utility of Yoga reduced the menopausal symptoms in all the domains and thereby improved the overall quality of life.

#### **Association of pre and post test menopausal symptoms with demographic and clinical variables in Yoga and Non-Yoga groups of menopausal women**

In the current study, none of the demographic variables showed significant association with their menopausal symptoms in the pretest among Yoga and Non-Yoga groups of Menopausal women.

There was significant association at  $P < 0.05$  between Nature of Menstrual Cycle before Menopause and Menopausal Symptoms in the post test in both Yoga and Non- Yoga groups. Other demographic variables did not show any significant association. Hence the Null hypothesis  $H_{04}$  is partially rejected.

In the current study, the BMI in the pretest showed strong association with Menopausal Symptoms (MRS) with high significance at  $P < 0.01$  and  $P = 1.00$  in both Yoga and Non- Yoga group respectively. Waist Circumference also had a very strong association with Menopausal Symptoms showing statistically very high significance at  $P < 0.001$  and  $P = 1.00$  in both Yoga and Non- Yoga groups respectively. However

there was no significant association between other clinical variables and menopausal symptoms. Hence the Null Hypothesis  $H_{05}$  is partially rejected.

Similar results were found in a study done by Peter Chedraui et al in Latin America which showed that obese post menopausal women found to have more severe menopausal symptom than non obese.

The clinical variables were associated with the post test Menopausal symptoms. BMI in Yoga group and pulse rate in Non-Yoga group shown association with post test MRS ( $P > 0.05$ ). The normal BMI was associated with Less than median MRS and statistically highly significant ( $P < 0.01$ ). The normal pulse rate was also associated with less than median MRS and the association was statistically significant ( $P < 0.05$ ). Hence the Null Hypothesis  $H_{05}$  was partially rejected.

#### **Association of pre and post test quality of life with demographic and clinical variables in Yoga and Non- Yoga groups of menopausal women**

None of the demographic variables showed any association with Quality of Life (MENQOL) in the pretest except nature of work which showed significant association at  $P < 0.05$ . Hence Null Hypothesis  $H_{06}$  is partially rejected.

The post test association between demographic variables and Quality of Life (MENQOL) revealed that there was no significant association between demographic variables and MENQOL in both Yoga and Non-Yoga groups.

The clinical variables were associated with MENQOL in the pre-test. BMI and Waist Circumference in Yoga group ( $P < 0.01$  and  $P < 0.05$ ) and Pulse rate in Non – Yoga group  $P < 0.05$  showed statistically significant association. Other variables did

not show any statistically significant association. Hence the Null Hypothesis Ho<sub>7</sub> is partially rejected.

There is no statistically significant association between clinical variables and Menopause Specific Quality of Life in the Post test.

### **Determination of level of satisfaction**

87.04% of Menopausal women in Yoga group were highly satisfied with Yoga as a mind body intervention and 12.96 % were satisfied. None of them was in the category of dissatisfied and highly dissatisfied.

This high level of satisfaction may have been caused due to the impact of Yoga. This effect of Yoga seems to be due to its benefits on the nervous system, musculo-skeletal system, and pulmonary function. Yoga had a positive effect on physical strength and fitness i.e., the stretching and muscular conditioning associated with attaining various Yoga postures increases the oxidative capacity of skeletal muscle and further decreases glycogen utilization. Yoga practice may also increase the calcium absorption from the intestine, stimulates remodelling of the bones and helps to preserve the load bearing capacity of the bones.

### **Summary**

Considering the objectives, hypothesis and study findings, this discussion chapter dealt on the effectiveness of Yoga on menopausal symptoms. The forthcoming chapter gives a brief report of the summary of major findings, conclusions, nursing implications, limitations and recommendations. Thus this chapter highlights the findings in view of hypotheses and compared the findings with other similar published studies conducted in the past in nursing and various health disciplines.

## *Chapter VI*

*Summary, Conclusion, Implications*

*Recommendations*

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## **CHAPTER - VI**

### **SUMMARY, IMPLICATIONS, RECOMMENDATIONS AND CONCLUSION**

Menopausal transition marks a period of physiologic changes as women move towards reproductive senescence. Evidence supports the importance of the transition for many women as a phase of temporal changes in health and menopause specific quality of life (ie, vasomotor symptoms, sleep disturbance, depression) and long term changes in several health outcomes (ie. Urogenital symptoms, bone, lipids) that may influence women's quality of life and the likelihood of healthy ageing. (Harlow et al. 2012).

Menopausal symptoms bring in discomfort in the women. These symptoms vary in severity and character from person to person affecting the quality of life. Managing menopause is a challenge women undergo at present. Estrogen deficiency being the cause, hormone replacement therapy (HRT) becomes the prime treatment of choice. However, the side effects of HRT outweigh the benefits. Considering the limitations of HRT, the present study explores the Non hormonal, Non pharmacological way of managing menopause. Yoga is one such therapy. Practice of Yoga brings union of body with mind. Yoga is utilised in this study to manage menopausal symptoms in a Non-invasive, effective manner which is available free of cost and free of side effects.

This chapter presents the major findings of the study, conclusions drawn and implications of the study, limitations encountered and the recommendations for the future research. The present study was intended to find the effectiveness of Yoga on menopausal symptoms in menopausal women at selected Primary Health Centres of Thiruvallur District, Chennai. This research work was conducted in partial fulfilment

of the requirements for the award of doctor of philosophy in nursing under The Tamil Nadu Dr. MGR Medical University, Chennai.

**The objectives of the study were :**

1. To assess and compare the effect of Yoga on menopausal symptoms before and after administration of Yoga between Yoga and Non-Yoga groups of menopausal women.
2. To assess and compare the effect of Yoga on quality of life between Yoga and Non –Yoga groups of menopausal women.
3. To correlate menopausal symptoms with quality of life among Yoga and Non-Yoga groups of menopausal women.
4. To find out the association of pre and post test menopausal symptoms with the selected demographic variables in Yoga and Non-Yoga groups of menopausal women.
5. To find out the association of pre and post test menopausal symptoms with the selected clinical variables in Yoga and Non-Yoga groups of menopausal women.
6. To find out the association of pre and post test quality of life with the selected demographic variables in Yoga and Non-Yoga groups of menopausal women.
7. To find out the association of pre and post test quality of life with the selected clinical variables in Yoga and Non-Yoga groups of menopausal women.
8. To determine the level of satisfaction regarding Yoga among Yoga groups of menopausal women.

The conceptual framework of the present study was developed based on the Pender's revised health promotion model (2011). This model accounts for health

promoting behavior i.e., Yoga practice to improve well being. Thus it provides an understanding of how Yoga practice in a phased manner helps in managing menopausal symptoms. The major study variables in the study were menopausal symptoms in menopausal women in terms of their menopause specific quality of life before and after the Yoga intervention. Yoga, a Complementary and Alternative Medicine is a mind-body intervention.

The study used cluster sampling technique. Total sample size estimated was 240, out of which 120 samples were assigned to Yoga group and 120 samples to Non – Yoga group from selected sub centres of two selected Primary health centres. There were however 12 drop outs in the Yoga group. Pretest and post test assessments were done for the subjects in Yoga and Non-Yoga groups which were compared before and after the Yoga intervention to test the effectiveness of the same.

The data collected were analysed according to the objectives and hypothesis of the study. The analysis of data was done through an integrated system of computer programme known as statistical package for social sciences (SPSS) 20.0. The major findings of the study were as follows:

### **Major Findings**

Majority of the menopausal women in the Yoga group (85.2%), and Non – Yoga group (85.8%) were married and living with husband. The distribution of educational status shows that significant percentage of menopausal women in Yoga and Non-Yoga group were primary and high school educated (44.4% ,40.8%), majority were homemakers (77.8%,77.5%), a significant percentage were moderate workers (51.9%, 55.9%), having family monthly income < 15,000 (47.2%, 40%), majority had mixed diet as their food habit (74.1% ,70.0% ), majority were living in

nuclear family (75.9%, 83.3%) & were Hindus (85.2%,74.2%) in Yoga and Non-Yoga groups of menopausal women respectively.

The mean age at natural menopause was  $46.9 \pm 4.0$  years and  $47.0 \pm 3.5$  years in Yoga and Non-Yoga groups respectively. Similarly, the mean current age was  $52.9 \pm 6.3$  and  $52.8 \pm 6.2$  and duration of menopause was ( $6.1 \pm 5.2$  and  $5.9 \pm 5$ ) in Yoga and Non-Yoga groups of menopausal women.

Majority of them had irregular menstrual cycle before menopause (74.1%, 77.5%), all of them had normal Breast examination findings (100%, 100%), most of them had no Fracture History (94.4%, 94.2%), consumed coffee and tea (64.8%, 66.7%) and majority of the menopausal women had diabetes (37.0%, 37.5%) as a co-morbid condition in Yoga and Non-Yoga groups respectively.

This study also inferred the mean values of clinical (continuous) variables such as Water intake in litres ( $1.9 \pm 0.41$ ,  $1.9 \pm 0.4$ ), Height in cms ( $156.2 \pm 5.7$ ,  $156.2 \pm 5.6$ ), weight in kg ( $63.0 \pm 6.8$ ,  $63.0 \pm 6.6$ ) BMI ( $25.8 \pm 2.2$ ,  $25.8 \pm 2.1$ ), Waist Circumference in cms ( $95.0 \pm 8.2$ ,  $94.8 \pm 8.1$ ) respectively.

In the present study, most of the women had severe somatic symptoms (63.9%, 66.7%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (61.1%) of them experienced mild somatic symptoms and significant (34.3%) of them experienced moderate level of somatic symptoms after post test in the Yoga group.

Most of the women had severe psychological symptoms (62.1%, 65.8%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (70.4%) of them experienced mild psychological symptoms and significant (29.6%) of them

experienced moderate level of psychological symptoms after post-test in the Yoga groups.

Most of the women had moderate urogenital symptoms (42.6%, 48.3%) in the pretest in Yoga and Non-Yoga groups respectively. Whereas majority (71.3%) of them experienced mild urogenital symptoms and significant (21.3%) of them experienced moderate level of urogenital symptoms.

Coming to total menopausal symptoms, most of the women had severe menopausal symptoms (71.3%, 82.5%) in the pre test in Yoga and Non-Yoga groups respectively. Whereas majority (72.2%) of them experienced mild menopausal symptoms and significant (27.8%) of them experienced moderate level of menopausal symptoms after post-test in the Yoga groups.

In the present study, the mean values of Menopause Rating Scale in somatic domain of Yoga group before Yoga was  $9.2 \pm 2.2$ . The mean psychological domain of Yoga group before Yoga was  $10.4 \pm 1.9$ . The mean uro-genital domain of Yoga group before Yoga was  $5.9 \pm 2.1$ . The mean total menopausal symptoms of Yoga group before Yoga was  $25.4 \pm 4.7$ . With regard to prevalence majority of them had severe (63.9%) somatic symptoms, majority of them had severe (62.1%) psychological symptoms and only significant of them experienced severe (36.1 %) urogenital symptoms.

The Effectiveness of Yoga in controlling menopausal symptoms (domain-wise and total) within groups among Yoga and Non – Yoga group of Menopausal women are as follows : The mean improvement was  $5.3 \pm 1.4$  and the same was statistically very highly significant ( $P < 0.001$ ). The mean psychological domain of Yoga group before Yoga was  $10.4 \pm 1.9$  and after Yoga was  $4.0 \pm 1.2$ . The mean improvement was

6.4±1.8 and the same was statistically very highly significant (P<0.001). The mean urogenital domain of Yoga group before Yoga was 5.9±2.1 and after Yoga was 2.7±1.2. The mean improvement was 3.2±1.5 and the same was statistically very highly significant (P<0.001).

The mean total menopausal symptoms of Yoga group before Yoga was 25.4±4.7 and after Yoga was 10.6±2.7. The mean improvement was 14.7±3.3 and the same was statistically very highly significant (P<0.001).

In the current study Menopause specific quality of life is determined by the following findings: Most of the menopausal women were under the category menopausal symptoms – bothered great extent (88.0%, 90.0%) in the pre test in Yoga and Non-Yoga groups respectively. Whereas majority (63.0%) of them were having menopausal symptoms not bothered and significant (37.0%) of them had menopausal symptoms-bothered to some extent after post test in the Yoga group.

There is a positive correlation between somatic domain of MRS and the MENQOL (vasomotor and physical domain) 0.409, psychological domain of MRS and MENQOL (psychosocial) 0.225, uro-genital domain of MRS and MENQOL (sexual) in the Yoga group after the intervention when compared to the Non Yoga group. The post test Yoga group domains determined as 16.7%, 5.1% and 26.2% respectively. In the Non Yoga group the pre MRS domains namely somatic, psychological and urogenital were correlated with respective MENQOL domains and they were positively correlated except Psychological domain (P<0.001).

## **IMPLICATIONS**

### **Nursing Theories and Models**

Theories and models exclusively for application in the menopausal stage of life are yet to be developed. The path analysis attempted by the researcher in this study could be an infant step forward. Yoga as an intervention in this study had a significant impact in bringing favourable results by reducing the menopausal symptoms. Various Models of Prevention also pave way for nurses to have a better understanding on menopause and its aspects. New theories and models can be prepared by nurses exclusively for use in menopausal stage of life.

### **Nursing Education**

Nurses could learn and integrate the knowledge of Yoga in the clinical care settings. The subject knowledge on menopause is negligible for nurses as nursing curriculum does not emphasise on menopausal health in the undergraduate curriculum. Continuing nursing education cells in different institutions can start focussing on menopausal women and their health issues through creating awareness to teachers and students on various menopausal symptom rating scales and questionnaires. It is essential also to conduct CNE on various pharmacological and Non-pharmacological interventions for menopausal symptoms including complementary and alternative medicine. Nursing education must emphasise primary care approach focussing on preventive care. Prevention could be from primordial prevention to quaternary prevention. Students could be motivated to conduct mass awareness programmes, rallies and street plays to create awareness to midlife women. Also a dietary exhibit could be organised for perimenopausal women as targeted audience.

## **Nursing Practice**

Basically menopausal symptoms are neglected by women in premenopause and hence they don't talk out about it. When they express it to health professionals, it may be advanced. Community health nurses have a major responsibility in identifying and suggesting various strategies to women in natural menopause. On the other hand, there were many women who underwent hysterectomy due to abnormal uterine bleeding. They have to be explained about the procedure in the post operative period or at least during discharge if their ovaries are removed. Women who underwent hysterectomy with bilateral oophrectomy are at surgical menopause and hence nurses in the surgical units need to educate about menopause and its symptoms to the menopausal women at discharge. Advice and counselling on supportive therapy and dietary modification (consuming cabbage, beans, soya and broccoli) have to be given to such surgically menopausal women.

Yoga as a Complementary and Alternative Medicine has proved to have great scope in its application in a wide variety of clinical and community scenarios – muscular and joint pain, insomnia, obesity, urinary incontinence, asthma, hot flashes, stress, lack of concentration, Parkinson's disease, hypertension, diabetes. Nurses come across plenty of opportunities to explore the benefits of Yoga on patients and to teach Yoga for those in the community, thus facilitating them to attain holistic health and an enhanced quality of life.

Yoga is found to be safe and free from side effects. The effect of Yoga is both on the body and mind, as a therapeutic intervention if practiced for over a period of time brings better changes in life style. Community health nurses can learn Yoga and facilitate people at different walks of life to manage their health issues with Yoga,



especially menopausal women could be counselled to practise Yoga from premenopausal through post-menopausal stage of life.

Nurses can make a daily routine of Yoga practice for their patients in their respective units specially in community, geriatric and palliative care settings. Yoga can serve as a vital tool in cardiac rehabilitation also. Even children at pediatric units will get pleasure from doing Yoga and thus facilitate speedy recovery.

### **Independent Yoga Practice**

The researcher has undergone Post Graduate Diploma in Yoga and Naturopathy under the Tamil Nadu Physical Education and Sports University. Yoga can be learnt by nurses so that they can help menopausal women overcome the symptoms in the community and even help people with morbid conditions to manage them in a better manner. Yoga education will aid nurses to be confident, stress free in their work settings helping them provide competent care. Education and Training will help nurses practise Yoga independently.

### **Menopause Practitioner**

Just like doctors specialising in certified menopause practitioner course under Indian Menopause Society, there needs to be a certification course for those interested nurses where they can freely provide counselling services for the needy women and also complementary and alternative therapies. Nurses can do collective bargaining in their councils and associations to begin such courses and thus empower them.

### **Nursing Administration**

Nurse leaders and nurse administrators should encourage the use of evidence-based complementary therapies as alternative nursing interventions in patient care.

Nurses should take initiative in collaborating with policy makers to create national policies for utilising Yoga techniques in menopausal women. Standing instructions concerning the use of Yoga as an alternative nursing intervention could be developed to alleviate suffering, to minimise pain and discomfort in menopause.

The researcher took initiative and has become the member of Indian Menopause Society, Chennai Chapter, Chennai City. The researcher is also constantly associated with the IMS attending continuing medical education programmes, conferences and lectures. The researcher also has organised a women's health camp under the banner of IMS free of cost for menopausal women in Perumalagaram. Nurse Administrators across the nation should organise continuing nursing education programmes, workshops and conferences to provide a scientific forum that discusses the use of Yoga and other alternative therapies.

### **Nursing Research**

More researches could be designed on menopausal health related aspects and strategies to overcome them have to be experimented. Evidence-based practice in nursing could be done by implementing systematic reviews and meta analyses following guidelines / tools from institutions like Oxford / Johns Hopkins College of Evidence Based Medicine. Yoga as alternative therapy is safe and cost effective. Therefore, more researches have to be planned, conducted and published. Complementary and Alternative therapies could be experimented for menopausal symptoms and their impact can be assessed. More Randomised Controlled Trials could be initiated as they serve as the Gold Standard of all the other research methods. Researches also could be conducted on dietary changes in menopause along with

other natural, alternative therapies to avoid untoward effects and comorbidities of Hormone Replacement Therapies.

### **Recommendations**

- A similar study could be replicated in different settings
- A community based descriptive study could be conducted to assess the prevalence of menopausal symptoms with a larger sample size.
- A cohort study could be planned to identify the presence and progress of menopausal symptoms from premenopausal stage to postmenopausal stage.
- An experimental study to assess the effectiveness of Yoga on menopausal symptoms could be done for a longer duration.
- An experimental study could be planned to assess the effect of Yoga nidra on menopausal insomnia.
- An experimental study could be done to know the effect of Yoga on urogenital symptoms.
- An experimental study could be done to compare the effectiveness Yoga Vs soy isoflavones on menopausal symptoms.
- A correlative study on menopausal symptom experience and quality of life on perimenopausal women could be designed.
- A PAN India study could be done to identify the presence and severity of menopausal symptoms in different regions of India.
- A multicentric trial could be planned to know the menopausal symptom experience on women in selected countries.
- A phenomenologic study could be done to gather the lived in experiences of postmenopausal women.

- A systematic review could be planned on the effect of Yoga in managing menopause specific quality of life.
- Another systematic review could be done on complementary alternative therapies on the menopausal symptoms.
- A meta analysis could be done on the effectiveness of Yoga on menopausal symptoms.
- Other Non-pharmacological interventions in Complementary and Alternative Medicine could be experimented on menopausal symptoms.

## **Conclusion**

The findings of this study show that there is reduction in menopausal symptoms in Yoga group of menopausal women thus proving it to be effective when compared to Non-Yoga group of menopausal women. Yoga as an alternative therapy is safe, free from side effects and can be practised in their own home settings. Women in menopause showed a positive attitude towards performing Yoga, they showed readiness to practise.

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[www.menopause.org](http://www.menopause.org) (The North American Menopause Society)

[www.mayoclinic.org/diseases-conditions/menopause/basics/treatment/con-20019726](http://www.mayoclinic.org/diseases-conditions/menopause/basics/treatment/con-20019726)

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*Annexures*

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## ANNEXURE A

### PART TIME PROVISIONAL REGISTRATION CERTIFICATE – PH.D DEGREE



#### THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

No.69, ANNA SALAI, GUINDY, CHENNAI - 600 032.

Website : www.tnmgrmu.ac.in

E-mail : mail@tnmgrmu.ac.in

☎ : 22353574, 22353576 - 79, 22301760 - 63, 22353094

Fax : 91-44-22353698

Dr. S.T. RADIGHA, M.D.,

Dated: 10.07.2013

ACADEMIC OFFICER i/c.

#### PROVISIONAL REGISTRATION CERTIFICATE FOR Ph.D.

1)	Name of the Candidate	: Mrs. G. SHOBANA
2)	Qualification	: M. Sc. (N)
3)	Duration of the Research	PART - TIME - 4 YEARS
4)	Name and Designation of Guide	: Dr. Latha Venkatesan, M.Sc.(N), Ph.D., Principal, Apollo College of Nursing, Chennai.
5)	Name and Designation of Co-Guide	: Dr. C. Susila, Principal, Billroth College of Nursing, Chennai.
6)	Department in which candidate is conducting Research	: Obstetrics & Gynaecology Nursing
7)	Name of the Institution	: Apollo College of Nursing, Chennai.
8)	Broad Topic of Research	: Nursing
9)	Provisional Title of Research	: "EFFECTIVENESS OF YOGA UPON MENOPAUSAL SYMPTOMS IN MENOPAUSAL WOMEN AT SELECTED PRIMARY HEALTH CENTRES OF THIRUVALLUR DISTRICT, CHENNAI."
10)	Faculty & Branch	: NURSING & COMMUNITY HEALTH NURSING
11)	Date of Registration i.e. session	: 01.01.2013
12)	Date of conduct of Methodology Examination	: 01.01.2014
13)	Last Date for completion of Methodology examination	: 31.01.2014
14)	Last date for submission of Synopsis	: 01.10.2016
15)	Prescribed date for submission of Thesis	: 01.01.2017
16)	Last date for submission of Thesis	: 01.01.2018

  
ACADEMIC OFFICER i/c.

/ 2011

2/10/13



# THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

No.69, ANNA SALAI, GUINDY, CHENNAI - 600 032.

Website : www.tnmgrmu.ac.in  
E-mail : mail@tnmgrmu.ac.in

Phone : 22353574, 22353576 - 79, 22301760 - 63, 22353094  
Fax : 91-44-22353698

Dr. S.T. RADIGHA, M.D.,  
ACADEMIC OFFICER. *l/c.*

Ref. No.ACI(2)/24313/2012

Dated: 10.07.2013

To

Dr. Latha Venkatesan, M.Sc.(N), Ph.D.,  
Principal  
Apollo College of Nursing,  
Vanagaram to Ambattur Road,  
Ayanambakkam, Chennai 95.

*S.T. Radiga  
15/7/13*

Madam,

Sub:	Academic - The Tamil Nadu Dr. M.G.R. Medical University, Chennai - Mrs. G. SHOBANA - Application for PART - TIME Ph.D. Registration - Provisional Registration-Reg.
Ref:	1. Ph.D. Application dated 24.07.2012. 2. Minutes of the Meeting in the Screening Committee in the Speciality of 'NURSING' held on 07.06.2013. 3. Your letter dated 14.06.2013 & 28.06.2013.

I enclose herewith, the PART - TIME Research Provisional Registration Certificate in respect of Mrs. G. SHOBANA for the research leading to the award of Ph.D. Degree.

I am to request you, to obtain and forward the Joining Report of the candidate to this University within 30 days from the date of receipt of this order. Failing which, her Registration for Ph.D. Programme will be automatically cancelled.

Yours faithfully,

*S.T. Radiga*  
ACADEMIC OFFICER *l/c.*


Copy to :

Mrs. G. SHOBANA, Ph.D. candidate.

/ 2011

## ANNEXURE B

### CONFIRMATION OF PROVISIONAL REGISTRATION

	<b>THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY</b> No.69, ANNA SALAI, GUINDY, CHENNAI - 600 032. Website : www.trimgmu.ac.in Ph : 22353574, 22353576 - 79, 22301760 - 63, 22353094 E-mail : mail@trimgmu.ac.in Fax : 91-44-22353698
<b>DR.S.MOHAN DHAS JOE CHANDRA,MBBS, DCH, CONTROLLER OF EXAMINATIONS(FAC)</b>	
<b>Ref.No.EXII(1)/24313/2012</b>	<b>Dated: 09.04.2014</b>
<b>To</b>	
Dr.Latha Venkatesan,M.Sc.,(N),Ph.D., Principal, Apollo College of Nursing Vanagaram to Ambattur Road, Ayanambakkam, Chennai 600 095.	<i>Author 16/4</i>
<b>Madam,</b>	
<b>Sub:</b> The Tamil Nadu Dr. M.G.R.Medical University, Chennai – Research leading to Ph.D.– <b>Ms.G.SHOBANA</b> - Part I Methodology Examination <b>JANUARY 2014</b> – Confirmation of Provisional Registration Order for Ph.D. – Regarding.	
<b>Ref:</b> 1. This University's Letter of even number dated 28.02.2014 2. Your letter received on 27.03.2014 *****	
In the reference first cited, It was informed that the Part I - Paper I Methodology Examination was conducted on 22.01.2014 at University Premises and Paper II & Paper III conducted by the Doctoral Advisory Committee on 23.01.2014 & 24.01.2014 in respect of the Candidate <b>Ms.G.SHOBANA</b> and the report sent thereon is hereby approved by this University, to proceed with the course for Ph.D. degree.	
2. In the reference second cited, a sum of Rs.5,000/- has been received from you. In view of this, the provisional registration of the candidate for Ph.D. Degree as <b>PART-TIME</b> candidate is hereby confirmed with effect from <b>01.01.2013</b> . The candidate Registered Number is <b>141320010</b> .	
Last date for submission of Synopsis : 01.10.2016	
Prescribed date for submission of Thesis : 01.01.2017	
Last date for submission of Thesis : 01.01.2018	
All the members of the Doctoral Advisory Committee may kindly be informed accordingly.	
<b>P.T.O.</b>	

:2:

The candidate should submit 6(six) copies of the Synopsis through the Guide along with the prescribed application form together with the fee prescribed and the necessary original certificates along with xerox copy. While submitting the Synopsis and Thesis, kindly ensure that the title of research should be as per the title approved by this University. The wrapper of the Thesis should be in PINK colour.

It is informed that the said candidate has not permitted for change of title as per Ph.D. Regulation.

30.5 As per the provisions existing in the Ph.D. Regulations, the candidates are permitted for change of title of the thesis before the Methodology Examination. The Research candidates who apply for change of title after their methodology Examination, may be instructed to apply as a fresh candidate with new title and proposal.

Regulation for Ph.d. 2010 is available in the University Website [www.tnmgrmu.ac.in](http://www.tnmgrmu.ac.in) for information and necessary action.

The number and date of this communication should be quoted in all future correspondence.

All the communications relating to the candidate should be addressed only by the guide and any communication by the candidate directly to the University will not be considered.

  
CONTROLLER OF EXAMINATIONS (FAC)

Copy to:

Ms.G.SHOBANA,  
Research Scholar,  
Apollo College of Nursing  
Vanagaram to Ambattur Road,  
Ayanambakkam, Chennai 600 095.

  
10/11/14

2/12

The candidate should attach this alongwith the application while submitting the synopsis.

ANNEXURE -C

CONSTITUTION OF DOCTORAL ADVISORY COMMITTEE

THE TAMIL NADU Dr.M.G.R. MEDICAL UNIVERSITY

No.69, Anna Salai, Guindy, Chennai 600 032.

Phone No.22353574/76-79, Fax : 91-44-22353698.

Web Site: www.tnmgrmu.ac.in.E-mail: mail@tnmgrmu.ac.in

\*\*\*\*\*  
DR.S.MOHAN DHAS JOE CHANDRA,MBBS, DCH,  
CONTROLLER OF EXAMINATIONS(FAC)

Ref.No. EXII(I)/24313/2012

Dated: 30.09.2013

To

Dr.Latha Venkatesan,M.Sc.,(N),Ph.D.,  
Principal, Apollo College of Nursing  
Vanagaram to Ambattur Road,  
Ayanambakkam, Chennai 600 095.

Sir,

Sub: The Tamil Nadu Dr.M.G.R.Medical University, Chennai - Research leading to  
Ph.D. - Mrs.G.SHOBANA - Registered for Ph.D. during 01.01.2013  
session - Constitution of Doctoral Advisory Committee - Reg.

Ref: Your letter received on 23.09.2013.

\*\*\*\*\*

With reference to your letter cited, I am to inform you that the constitution of Doctoral Advisory Committee consisting of the following persons to examine the Ph.D. candidate, Mrs.G.SHOBANA for Part I Methodology of the Ph.D degree in has been approved.

1. Dr.Latha Venkatesan,B.Sc (N),M.Sc(N),  
M.Phil., Ph.D., -GUIDE  
Principal, Apollo College of Nursing,  
Vanagaram to Ambattur Main Road,  
Ayanambakkam, Chennai 600 095.
2. Dr.C.Susila, M.Sc(N), Ph.D., -MEMBER  
Principal, Billroth College of Nursing,  
2, Mettukuppam Road, Maduravayil,  
Chennai 600 095.
3. Dr.K.Prema Sekar, M.Sc (N), M.Phil., Ph.D., -MEMBER  
Principal, Annai Velakani's College of Nursing,  
33/1, Gandhi Road, Nedunkundram Village,  
Komapakkam Post, Chennai 600 048.

TITLE: "EFFECTIVENESS OF YOGA UPON MENOPAUSAL SYMPTOMS IN  
MENOPAUSAL WOMEN AT SELECTED PRIMARY HEALTH CENTRES OF  
THIRUVALLUR DISTRICT, CHENNAI",

P.T.O.

/2011



2. I request you to kindly inform the other members and the candidate concerned regarding the date, time and venue of Advisory Committee meeting to be held.

3. I am also to request you to kindly prescribe the course the candidate has to undergo in consultation with the Advisory Committee after interviewing the candidate. A copy of the course work so prescribed may also be forwarded to this office record.

4. Further, you are permitted to conduct the Methodology examination both written and oral during JANUARY 2014 and forward the Minutes, duly signed by all the members of the Advisory Committee on the candidate's fitness to proceed with his research work for the Ph.D. degree along with question paper and Answer script. The percentage (%) of marks obtained by the candidate in oral and written should be indicated separately in the report.

5. The Part I Methodology Examination should be conducted with the following New Ph.D. Regulation. The Regulation are:

**20-B. PART-I METHODOLOGY EXAMINATION:-** As resolved in the 44th Meeting of the Standing Academic Board dated 15.06.2012, the candidates those who have registered from 01.07.2012, shall write 3 papers in Methodology Examinations.

Three papers for the Methodology Examination (The candidates those who have registered from 01.07.2012.)

The Methodology -Paper I Examination is common to all speciality

Paper-I - Research Methodology - University Premises

Paper-II - Broad subject of the field - Research Centre

Paper-III - Area related to the thesis subject - Research Centre

Followed by Oral presentation of the proposal.

1. All the Ph.D. candidates should undergo the following training in Research Methodology, Biostatistics and Bio-ethics. The Ph.D. research work involving human subject and clinical trials should undergo GCP [Good Clinical Practice] training.

2. The above mentioned training should be completed during the I Year, before the Methodology Examination.

3. The workshop in Research Methodology and Biostatistics shall be conducted in the Department of Epidemiology of the University.

4. The workshop for the Bio-ethics can be conducted and the experts suggested to do this workshop is Dr. Vasantha Muthusamy and Dr. Nandhini, Retd, Addl. Directors, ICMR.

5. The workshop for GCP can be conducted and the expert suggested is Dr. Varalaksmi Elango, Consultant, GCP.

6. Examination for Paper-I Research Methodology shall be conducted at the University twice in a year. Candidates will become eligible to appear for Paper I Research Methodology Examination after one year from his/her Joining Date. The Paper II and III shall be conducted at the concerned Institutions.

7. The Ph.D. candidates should complete course work in the first year before the methodology exam.

..3..

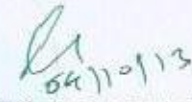
It is to inform that you are direct to the candidate to attend the Workshop before conduct of the Methodology Examination.

**Regulation for Ph.D. is available in the University website [www.tamgrmu.ac.in](http://www.tamgrmu.ac.in) for information and necessary action.**

6. The specific area of research in which the candidate would continue his investigation may also be indicated in the report.

7. Further, it is informed that the committee members are entitled to receive Rs.1,000/- (Rupees One thousand only) per examination for conducting Methodology examination, to which Remuneration forms are enclosed for your use.

8. All the communications relating to the candidate should be addressed only by the guide and any communication by the candidate directly to the University will not be considered.

  
CONTROLLER OF EXAMINATIONS (FAC)

Encl.: Remuneration Forms – 1 Nos.

/ 2011

## ANNEXURE D

### INSTITUTIONAL ETHICS COMMITTEE APPROVAL CERTIFICATE

ECR/37/Inst/TN/2013

## Ethics Committee



29 October, 2014

To,  
Mrs. Shobana. G  
Ph. D (Nursing),  
Apollo College of Nursing, Chennai.

**Ref:** Effectiveness of yoga menopausal symptoms in menopausal women in selected primary health centers of Thiruvallur District.

**Sub:** Approval of the above referenced project and its related documents.

Dear Mrs. Shobana,

Ethics Committee-Apollo Hospitals has received the following document submitted by you related to the conduct of the above-referenced study.

- Project Proposal
- Informed Consent Form

The Ethics Committee-Apollo Hospitals reviewed and discussed the Project proposal documents submitted by you related to the conduct of the above referenced Project at its meeting held on 28 October, 2014. The following Ethics Committee Members were present at the meeting held on 28 October, 2014

Name	Gender	Designation	Affiliation	Position in the committee
Dr. P. Nalini Rao	F	Independent Consultant	Independent Consultant, Chennai	Chairperson (Social Scientist)
Dr. Rema Menon	F	Blood Bank Officer	Apollo Hospitals, Chennai	Member Secretary
Dr. P. Muralidaran	M	Pharmacologist	CLBMCP, Chennai	EC-Member (Pharmacologist)
Mrs. S.V. Mathanghi	F	Executive- project	Apollo Pharmacy, Chennai	EC-Member (Layperson)
Dr. K. Sathyamurthi	M	Asst. Professor	Madras School of Social work, Chennai	EC-Member (Social Scientist)
Dr. Vijayakumar Chocckan	M	Medical Superintendent	Apollo Speciality Hospitals, Chennai	EC-Member (Clinician)

Apollo Hospitals Enterprise Limited  
21, Greams Lane, Off Greams Road, Chennai - 600 006  
Tel : 91 - 44 - 2829 1618, 2829 3333, 91 - 44 - 2829 5465 Extn : 5045 / 6641  
Fax : 91 - 44 - 2829 1618 / 4449 E - Mail : ecapollochennai@gmail.com



## Ethics Committee

Dr. Harikrishna Reddy	M	Consultant physician	Apollo Hospitals, Chennai	EC-Member (Clinician)
Mr. Philip. T. Paul	M	Lawyer	Independent Legal Practitioner	EC-Member (Lawyer)

After due ethical and scientific consideration, the Ethics Committee has approved the above presentation submitted by you.

The EC review and approval of the report is only to meet the academic requirement and will not amount to any approval of the conclusions / recommendations as conclusive, deserving adoption and implementation, in any form, in any healthcare institution.

The Ethics Committee is constituted and works as per ICH-GCP, ICMR and revised Schedule Y guidelines.

With Regards,

Date: 29/10/14

Dr. Rema Menon,  
Ethics Committee-Member Secretary,  
Apollo Hospitals, Chennai,  
Tamil Nadu, India.

**Dr. REMA MENON**  
**MEMBER SECRETARY**  
**ETHICS COMMITTEE, APOLLO HOSPITALS**  
**APOLLO HOSPITALS ENTERPRISE LIMITED**  
**CHENNAI-600 006, TAMILNADU**

---

Apollo Hospitals Enterprise Limited  
21, Greams Lane, Off Greams Road, Chennai - 600 006  
Tel : 91 - 44 - 2829 1618, 2829 3333, 91 - 44 - 2829 5465 Extn : 5045 / 6641  
Fax : 91 - 44 - 2829 1618 / 4449 E - Mail : [ecapollochennai@gmail.com](mailto:ecapollochennai@gmail.com)

## **ANNEXURE - E**

### **CERTIFICATE OF PLAGIARISM CHECK**

This is to certify that this dissertation work titled “**An Experimental study to assess the Effectiveness of Yoga upon menopausal symptoms in menopausal women at selected primary health centres of Thiruvallur District, Chennai**” of the candidate **Prof. Shobana Gangadharan** with Registration Number **141320010** for the award of Ph.D in Nursing in the branch of Community Health Nursing . I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from Introduction to Conclusion pages and result shows **1%** percentage of plagiarism in the dissertation.

**Dr. LATHA VENKATESAN, M.Sc(N), M.Phil., Ph.D.,M.B.A.,**  
**Principal & Ph.D Research Guide**  
**Apollo College of Nursing**  
**Vanagaram to Ambattur Road**  
**Ayanambakkam,**  
**Chennai – 600 095**

## Urkund Analysis Result

**Analysed Document:** Shobana Gangadharan PhD candidate Jan 2017.docx (D27378134)  
**Submitted:** 2017-04-20 14:22:00  
**Submitted By:** 2006.shobana@gmail.com  
**Significance:** 1 %

### Sources included in the report:

[http://www.jmidlifehealth.org/article.asp?  
issn=0976-7800;year=2015;volume=6;issue=4;spage=154;epage=159;auiast=Vakili;type=3](http://www.jmidlifehealth.org/article.asp?issn=0976-7800;year=2015;volume=6;issue=4;spage=154;epage=159;auiast=Vakili;type=3)  
[https://www.docphin.com/research/article-detail/18687702/PubMedID-27451321/Menopause-  
specific-health-literacy-in-Japanese-women](https://www.docphin.com/research/article-detail/18687702/PubMedID-27451321/Menopause-specific-health-literacy-in-Japanese-women)  
<http://europepmc.org/articles/PMC4195180>

### Instances where selected sources appear:

5

U D27378134 - Shobana G X

Secure | <https://secure.orkund.com/view/27154797-534310-714625#q1bKLvayijYyNdMxMjcfYKsdlwsDlDaM1VEqzkzPy0zLTE7MS05VsjLQMzAwNjCzMDY0N>

**ORKUND**

**Document** [Shobana Gangadharan Ph.D candidate Jan 2017.docx](#) (D27378134)

**Submitted** 2017-04-20 17:52 (+05:0-30)

**Submitted by** 2006.shobana@gmail.com

**Receiver** 2006.shobana.mgrmu@analysis.orkund.com

**Message** Shobana Gangadharan Ph.D candidate Introduction to References [Show full message](#)

1% of this approx. 97 pages long document consists of text present in 3 sources.

**Sources** **Highlights**

- <http://www.imidifehealth.org/article.asp?issn=0976-7800;year=2015;volume=6;issue=4;spage=154;epage=15...>
- <https://www.docphn.com/research/article-detail/18687702/PubMedID-27451321/Menopause-specific-health...>
- <http://europepmc.org/articles/PMC4195180>

**Alternative sources**

- chapter 1-6.docx
- chapter 1-4.docx
- Chapters I - VI.docx
- Chapters I - VI.docx
- <http://www.imidifehealth.org/article.asp?issn=0976-7800;year=2015;volume=6;issue=4;spage=154;epage=15...>

1 Warnings Reset Export Share

Thesis Submitted to

THE TAMIL NADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI for the award of the degree of

DOCTOR OF PHILOSOPHY IN NURSING

By Prof. SHOBANA GANGADHARAN, M.Sc (N),

P.G.D.Y.N.,

Under the Guidance of

Dr. LATHA VENKATESAN, M.Sc (N), M.Phil., Ph.D., M.B.A., PRINCIPAL & Ph.D RESEARCH GUIDE APOLLO COLLEGE OF NURSING  
CHENNAI - 600 095

JANUARY 2017

EFFECTIVENESS OF YOGA UPON MENOPAUSAL SYMPTOMS IN MENOPAUSAL WOMEN AT SELECTED PRIMARY HEALTH  
CENTRES OF THIRUVALLUR DISTRICT, CHENNAI.

A

Thesis Submitted to THE TAMIL NADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI for the award of the degree of

DOCTOR OF PHILOSOPHY IN NURSING

By Prof. SHOBANA GANGADHARAN, M.Sc (N),

P.G.D.Y.N.

Ask me anything

18:13  
20-04-2017

## ANNEXURE F

### CERTIFICATE FOR ENGLISH EDITING

### TO WHOMSOEVER IT MAY CONCERN

This is to certify that the thesis entitled “An Experimental study to assess the Effectiveness of Yoga upon Menopausal Symptoms in Menopausal Women at selected Primary Health Centres of Thiruvallur District, Chennai” submitted by Prof.Shobana Gangadharan for the award of the degree of Doctor of Philosophy in Nursing, is edited for English language appropriateness.



Signature

**E.S.CHANDRASEKARAN, M.A., M.Phil, B.Ed.**  
Senior Faculty & HOD of English  
38/26, Karnan Street, Mogappair West,  
Chennai - 600 037.  
Contact: 80560 72541  
Email: e.chandrasekaran@yahoo.com



ANNEXURE -G

CERTIFICATE OF LIFE MEMBERSHIP IN INDIAN MENOPAUSE SOCIETY



# Indian Menopause Society

This is to certify that M/s SHOBANA GANGADHARAN has

Joined the Indian Menopause Society as *life / annual* member

Her / his life / Annual membership number is L - 2152

She / he is attached to Chennai Chapter

of the Indian Menopause Society.

*Jyothi Uari*  
President IMS

*Shobadillean*  
Secretary General IMS

ANNEXURE –H

CERTIFICATE OF THE AWARD OF POST GRADUATE DIPLOMA IN YOGA  
AND NATUROPATHY

Reg. No.: 20128562032

தமிழ்நாடு உடற்கல்வியியல் மற்றும் விளையாட்டுப் பல்கலைக்கழகம்  
TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY

யோகா மற்றும் உடல்நல அறிவியல்கள் புலம்  
FACULTY OF YOGA AND ALLIED HEALTH SCIENCES



தமிழ்நாடு உடற்கல்வியியல் மற்றும்  
விளையாட்டுப் பல்கலைக்கழக ஆட்சிக்குழு

ஷோபனா கங்காதரன் ..... என்பவர்


யோகா மற்றும் இயற்கை மருத்துவத்தில் முதுநிலைப் பட்டியம்  
முதல் ..... வகுப்பில் பெறுவதற்கு தகுதியுடையவர் என முறையாக  
அமைக்கப்பெற்ற தேர்வாளர்கள் ..... மே 2013 இல் நடைபெற்ற தேர்வுகளில்  
சான்றளித்தபடி இப்பட்டியத்தை அவருக்கு பல்கலைக்கழக  
இலச்சிணையுடன் வழங்குகிறது.


The Syndicate of the  
Tamil Nadu Physical Education and Sports University  
hereby confers the

**POST GRADUATE DIPLOMA IN YOGA AND NATUROPATHY**  
to  
**SHOBANA GANGADHARAN**  
with..... **FIRST** ..... class as having been certified by duly appointed  
examiners at the examination held in ..... **MAY 2013** .....

  Given under the seal of the University.

சென்னை Chennai  
நாள் Dated 19-02-2014

 பதிவாளர்  
Registrar

 துணை வேந்தர்  
Vice-Chancellor

## ANNEXURE – I

### LETTER GRANTING PERMISSION TO CONDUCT THE STUDY FROM DIRECTORATE OF PUBLIC HEALTH

R.No. 036407/SBHI-II/S3/15

Office of the Director of Public Health  
and Preventive Medicine, Chennai- 6.

Dated: 22/05/15.

Sub: Public Health and Preventive Medicine -SBHI- The Principal, Apollo College of Nursing, Ayanambakkam, Chennai Requesting permission to Mrs.Shobana Gangadharan, Professor, Apollo College of Nursing, Chennai doing Ph.D(Nursing) – permission to conduct research on "A study to assess the effect of Yoga on Menopausal symptoms among menopausal women at selected Primary Health Centre in Tiruvallur District" -regarding.

- Ref: 1. Ref: Letter dated 21.04.2015 of The Principal, Apollo College of Nursing, Ayanambakkam, Chennai-600 095.  
2. G.O.(D) No.648 Health and Family Welfare Department, Chennai-9. Dated 02/06/09.

Attention of the Deputy Director of Health Service Tiruvallur is invited and it is informed that Mrs. Shobana Gangadharan, Professor, Apollo College of Nursing, Chennai doing Ph.D(Nursing) is taking up "A study to assess the effect of Yoga on Menopausal symptoms among menopausal women at selected Primary Health Centre in Tiruvallur District".

Upon perusal of the request permission to take up study has been granted with the following conditions and after ensuring the payment of Rs. 6000/- (Rupees Six Thousand only) from the individual as per G.O.D. No. 648 dated: 02/06/09 of Health and Family Welfare Department (Copy enclosed).

- 1.The data should be kept confidential and the report should not be published without the permission of the Government.
- 2.The Data should be used for the Project work only.

S. Mrs. Shobana Gangadharan,  
Professor,  
Apollo College of Nursing,  
Ayanambakkam, Chennai-600 095.

3. Scholar have to pay Rs. 6,000/- for data collection in the Head of Account: "0210 Medical and Public Health - 04 Public Health 800 Other receipts A.D. Other Public Health Receipts. A D Other Public Health Receipts."

(D.P. code 0210-04-800-AD 0602).

4. Study report should be submitted to the Director of Public Health and Preventive Medicine.

5. If there is any deviation in the above action, action will be taken against the individual.

6. The study should not be detrimental to normal functioning of the Institution.


7. The views of the department should be obtained before finalizing the report for submission.

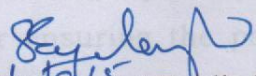
8. Progress of data collection should be appraised at each stage.

9. Study should have institutional ethics committee approval.

10. Consent form should be obtained from the study participant after giving the information sheet.

It is requested to provide necessary data to undertake the study to Mrs. Shobana Gangadharan, Professor, Apollo College of Nursing, Chennai doing Ph.D(Nursing) and inform the fact to this office without fail.

  
6/8/15

  
For Director of Public Health  
and Preventive Medicine, Ch-06.

TO:

Deputy Director of Health Services.  
Tiruvallur District.

Copy to

1. The Principal,  
Apollo College of Nursing,  
Ayanambakkam, Chennai-600 095.

2. Mrs. Shobana Gangadharan,  
Professor,  
Apollo College of Nursing,  
Ayanambakkam, Chennai-600 095.

**ANNEXURE – J**

**LETTER GRANTING PERMISSION TO CONDUCT THE STUDY FROM DDHS,  
THIRUVALLUR**

**R.No.4985/E2/2015,**

**Office of the  
Deputy Director of Health Services,  
Thiruvallur.  
Dated: 05.10.2015.**

Sub : Public Health –Study – Mrs.Shobana Gangadharan , Professor,  
Apollo College of Nursing, Chennai doing Ph.D (Nursing) –  
Permission to conduct research on "A study to assess the effect  
of Yoga on Menopausal symptoms among menopausal women at  
selected Primary Health Centre in Thiruvallur District"-  
Permissaion – Regarding.

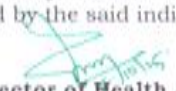
Ref : R.No. 036407/SBHI-II/S3/2015, Dated: 22.05.2015 of the  
Director of Public Health and Preventive Medicine, Chennai-6.

\*\*\*\*\*

With reference to the above letter cited, Mrs.Shobana Gangadharan ,  
Professor, Apollo College of Nursing, Chennai is here by permitted to collect data  
relating to project work "A study to assess the effect of Yoga on Menopausal  
symptoms among menopausal women at selected Primary Health Centre in  
Thiruvallur District" in Primary Health Centres, Naravarikuppam and  
Thiruverkadu Urban Primary Health Centre in this Health Unit District Subject  
to the following conditions.

- 10.The data should be kept confidential and the report should not be  
published without the permission of the Government.
- 11.The data should be used for the project work only.
- 12.Study report should be submitted to the Director of Public Health and  
Preventive Medicine.
- 13.If there is any deviation in the above, action will be taken against the  
individual.
- 14.The study should not be detrimental to normal functioning of the  
Institution.
- 15.The view of the department should be obtained before finalizing the report  
for submission.
- 16.Progress of data collection should be appraised at each stage.
- 17.Study should have institutional ethics committee approval.
- 18.Consent form should be obtained from the study participant after giving  
the information.

The medical officer of the primary health centres,  
Naravarikuppam is requested to provide the datas required by the said individual.

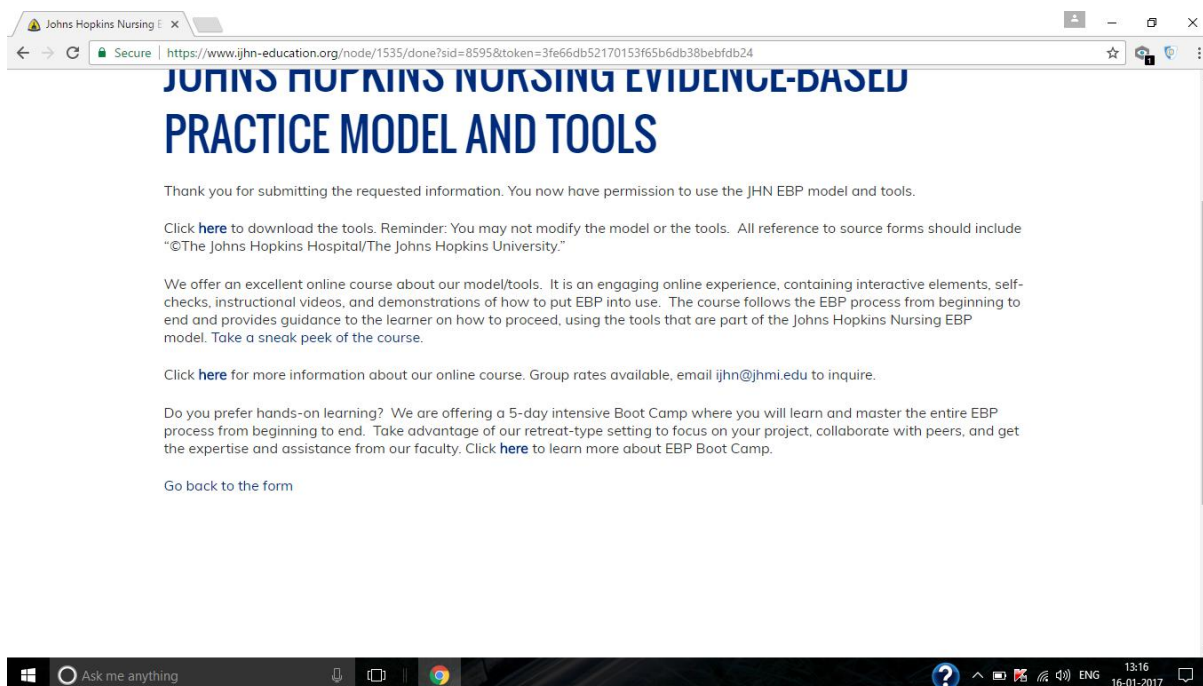
  
**Deputy Director of Health Services,  
Tiruvallur**

To: Mrs.Shobana Gangadharan Professor, Apollo College of Nursing, Chennai,  
Copy to:  
The Medical Officer, Primary Health Centres, Naravarikuppam of this Health  
Unit District.  
Copy Submitted to: The Director of Public Health and Preventive  
Medicine, Chennai-6.

  
8/10/15

## ANNEXURE K

# GRANT OF PERMISSION TO USE THE JOHNS HOPKINS NURSING EVIDENCE BASED PRACTICE MODELS AND TOOLS



The screenshot shows a web browser window with the following content:

Johns Hopkins Nursing E x

Secure | <https://www.ijhn-education.org/node/1535/done?sid=8595&token=3fe66db52170153f65b6db38beb6db24>

## JOHNS HOPKINS NURSING EVIDENCE-BASED PRACTICE MODEL AND TOOLS

Thank you for submitting the requested information. You now have permission to use the JHN EBP model and tools.

Click [here](#) to download the tools. Reminder: You may not modify the model or the tools. All reference to source forms should include "©The Johns Hopkins Hospital/The Johns Hopkins University."

We offer an excellent online course about our model/tools. It is an engaging online experience, containing interactive elements, self-checks, instructional videos, and demonstrations of how to put EBP into use. The course follows the EBP process from beginning to end and provides guidance to the learner on how to proceed, using the tools that are part of the Johns Hopkins Nursing EBP model. Take a sneak peek of the course.

Click [here](#) for more information about our online course. Group rates available, email [ijhn@jhmi.edu](mailto:ijhn@jhmi.edu) to inquire.

Do you prefer hands-on learning? We are offering a 5-day intensive Boot Camp where you will learn and master the entire EBP process from beginning to end. Take advantage of our retreat-type setting to focus on your project, collaborate with peers, and get the expertise and assistance from our faculty. Click [here](#) to learn more about EBP Boot Camp.

[Go back to the form](#)

Windows taskbar: Ask me anything, 13:16, 16-01-2017

# ANNEXURE L

## EVIDENCES OF PERMISSION TO USE STANDARDISED MENQOL

### QUESTIONNAIRE

The screenshot shows the MENQOL website interface. The browser address bar displays the URL: <https://eprovide.mapi-trust.org/instruments/menopause-specific-quality-of-life-questionnaire>. The page title is "Menopause-Specific Quality Of Life Questionnaire (MENQOL)" and it is distributed by Mapi Research Trust.

The page is divided into two main sections: "Access fees" and "Languages". The "Access fees" section is further divided into "ROYALTY FEES\*" and "DISTRIBUTION FEES\*".

Category	Cost per study	Cost per language
Commercial users	4500 € per protocol + 500€ per site	500€ per language (original version and translated versions)
	Free	Free
Funded academic research	Free	Free
	Free	Free
Not funded academic users	Free	Free
	Free	Free
Commercial users	1 000 €	500 €
	300 €	50 €
Funded academic research	Free	Free
	Free	Free

\* Excluding VAT  
Commercial users: Industry, CRO, any for-profit companies  
Funded Academic research: Projects receiving funding from commerce, government, EU or registered charity.

# ANNEXURE M

## EVIDENCE OF PERMISSION TO USE STANDARDISED MRS LIKERT SCALE

The screenshot shows a web browser window with the URL <http://hqlo.biomedcentral.com/articles/10.1186/1477-7525-1-28>. The page content includes a list of additional files and a conclusions section.

- [Additional file 6: Spanish version of the MRS](#)
- [Additional file 7: Mexican/Argentinean version of the MRS](#)
- [Additional file 8: Turkish version of the MRS](#)
- [Additional file 9: Brazilian version of the MRS](#)
- [Additional file 10: Indonesian version of the MRS](#)

It should be pointed out that individuals who are interested in using the MRS scale in their research can download the appropriate language version and use it without any formal permission. However, it would be important to keep an overview who is using the scale and for what reason. In return, all information on the scale that will have become known in between will be made available.

---

### Conclusions

The MRS scale is obviously a valuable tool for assessing health related quality of life of women in the menopausal transition and it is used worldwide. It is a standardized scale meeting psychometric norms. The currently available 9 language versions have been translated following international standards for the linguistic and cultural translation of quality of life scales. Assistance is offered to help interested parties in the translation process.

The browser interface includes a 'Table of Contents' dropdown menu, a 'Advertisement' placeholder, and a Windows taskbar at the bottom showing the time as 10:16 on 03-04-2017.



## ANNEXURE N

### LIST OF EXPERTS VALIDATED THE TOOL

1. Dr. Mrs.A.V.Raman  
Director – Nursing Education & Research  
West Fort College of Nursing  
Thrissur
2. Dr. Latha Venkatesan  
Principal  
Apollo College of Nursing  
Ayanambakkam  
Chennai 600095
3. Dr. Ganesh Kumar  
Scientist  
National Institute of Epidemiology  
Indian Council of Medical Research  
Ayapakkam  
Chennai.
4. Dr.Vijayalakshmi Seshadri  
Chennai Chapter Secretary –  
Indian Menopause Society  
Consultant Gynecologist & Obstetrician  
Sundaram Medical Foundation  
Anna Nagar  
Chennai.
5. Dr.C.Susila  
Principal  
Bilroth College of Nursing  
Maduaravoyal  
Chennai
6. Dr. Judie .A  
Assistant Professor  
Sultan Qaboos University  
Muscat  
Sultanate of Oman
7. Dr.Jane Vanitha  
Principal  
GRT College of Nursing  
Thiruttani
8. Dr. Asana Andiappan  
Asana Andiappan College of Yoga  
Anna Nagar  
Chennai
9. Prof. Valarmathi  
BioStatistician  
Department of Epidemiology  
The TamilNadu Dr. M.G.R  
Medical University  
Chennai
10. Dr. B.Ashok  
BioStatistician  
Adhiparasakthi College of Nursing  
Melmaruvathur  
Chennai

## ANNEXURE O

### REQUEST FOR OPINIONS AND SUGGESTIONS OF EXPERTS FOR ESTABLISHING CONTENT VALIDITY OF RESEARCH

To

Dear Sir / Madam,

Sub : **Requesting the opinion and suggestions of experts for establishing content validity of research tool.**

Greetings. I Mrs.Shobana Gangadharan is a faculty working in Apollo College of Nursing, Chennai and currently pursuing Ph.D in the specialization of Obstetrics and Gynecological Nursing at Apollo College of Nursing, Chennai as a part time course.

I am conducting a study 'To assess the Effect of Yoga on menopausal symptoms among post menopausal women at selected Primary Health Centres, Thiruvallur District.

Here with I am sending the developed tool for content validity and for your expert opinion and possible suggestions. It will be very kind of you to return the same to the undersigned.

Thanking You

Yours Sincerely

Mrs. Shobana Gangadharan

Research Scholar

Apollo College of Nursing, Chennai

## CONTENT VALIDITY INDEX OF TOOL

Dear Sir / Madam,

I request you to kindly examine the research tool and give your valuable opinion and suggestions on the developed tools. Please enter the items of each tool in the appropriate column on the basis of relevance. Your valuable opinion and kind suggestion will be highly appreciated.

<b>S.No</b>	<b>Tool</b>	<b>Completely meets the Criteria - Relevant</b>	<b>Meets the Criteria to some extent / Requires Modification</b>	<b>Does not meet the Criteria – Not Relevant</b>	<b>Remarks</b>
I	Demographic variable Proforma				
II	Clinical variable proforma				
III	Menopause Rating Scale				
IV	Menopause-Specific Quality of Life Questionnaire (MENQOL)				
V	Level of Satisfaction Rating scale				
VI	Intervention Protocol				

## **Certificate of Validation / Content Validity**

This is to certify that the research tool and intervention protocol constructed by Mrs. Shobana Gangadharan, currently pursuing her part time Ph.D Programme at Apollo College of Nursing, Chennai under The TamilNadu Dr.M.G.R Medical University, Guindy, Chennai for the research study to 'assess the effect of Yoga on menopausal symptoms among post menopausal women at selected primary health centres, Thiruvallur District' are found to be valid to the best of my knowledge.

Dated :

Name :

Signature :

Designation :

Seal :

## **ANNEXURE P**

### **PATIENT INFORMATION SHEET**

You are invited to take part in this research study. It is important that you understand several general principles that apply to all who take part in this study

- (i) Taking part in this study is entirely voluntary
- (ii) You may or may not benefit from taking part in this study, but the benefits will out weigh the risks.
- (iii) You may withdraw from this study at any point of time.
- (iv) The confidentiality of the details provided would be maintained.
- (v) The nature of the study, the risks and benefits are discussed.
- (vi) You are requested to discuss and clarify any doubts you have about this study.

#### **Nature of the study:**

This is an experimental study to assess the effect of yoga upon menopausal symptoms like hot flushes, sweating, osteoporosis, sleep problems, depressive mood, irritability, anxiety, physical and mental exhaustion, sexual problems, bladder problems, vaginal dryness and joint and muscular discomfort. The information gathered and the tests done will help the researcher to demonstrate Yoga and help you practice the same which controls the symptoms of menopause and provide ease and relief.

## INFORMED CONSENT

I have been informed about the procedures of the study as stated in the information. I have understood that I have the right to refuse my consent or withdraw it any time during the course of the study without adversely affecting my therapy. I am aware that by subjecting to this data collection, I will have to give more time for assessments by the researcher. I understand that the information gathered will be kept confidential and will be used only for the study purpose.

I, ----- , the undersigned , give my consent to be a participant of this study program

Signature of the Subject

Signature of the Researcher

(Name and Address)

Name and Designation

## DEMOGRAPHIC VARIABLE PROFORMA OF MENOPAUSAL WOMEN

### Purpose

This proforma is used by researcher to collect the information on demographic variables such as age, education, marital status, work status, nature of work, income, type of family, food habits, religion.

### Instructions

The researcher collects the following information from the participant by asking questions in the interview form. Please be frank and free in answering, it will be kept confidential and anonymity will be maintained.

**Name :**

**Address :**

**Phone No :**

Name, address and phone no of each sample are entered in a diary by the researcher along with sample no for future reference & follow up.

**1. Sample code number:**

**2. Age at Menopause :**

**3. Age in years**                    -----

**4. Marital status**

4.1 Married

4.2 Unmarried

4.3 Widow

4.4 Divorced / Separated

**5. Educational status**

- 5.1 Illiterate
- 5.2 Primary and middle school education
- 5.3 Higher secondary education
- 5.4 Graduate and above

**6. Occupation**

- 6.1 Home maker
- 6.2 Self employed
- 6.3 Employed
- 6.4 Others

**7. Nature of work**

- 7.1 Sedentary work
- 7.2 Moderate work
- 7.3 Heavy work
- 7.4 Others

**8. Income per month** -----

**9. Food habits**

- 9.1 Vegetarian
- 9.2 Ova vegetarian
- 9.3 Non vegetarian

**10. Type of family**

- 10.1 Nuclear family
- 10.2 Joint family
- 10.3 Extended family
- 10.4 Others



**11. Religion**

11.1 Hindu

11.2 Christian

11.3 Muslim

11.4 Others

## CLINICAL VARIABLE PROFORMA OF MENOPAUSAL WOMEN

### Purpose

This proforma is used to identify the clinical variables such as height, weight, BMI, waist circumference, Blood Pressure, pulse, body temperature etc

### Instructions

The researcher plans to use various measures to monitor the clinical variable parameters.

#### 1. Height

#### 2. Weight

#### 3. Body Mass Index

#### 4. Pulse rate -----

4.1 < 72 bpm

4.2 72- 80 bpm

4.3 > 80 bpm

#### 5. Systolic blood pressure -----

5.1 < 120 mmHg

5.2 120 – 140 mmHg

5.3 > 140 mmHg

#### 6. Diastolic blood pressure -----

6.1 < 80 mmHg

6.2 80 – 90 mmHg

6.3 > 90 mmHg

#### 7. Respiratory Rate -----

**8. Nature of menstrual cycle before menopause**

8.1 Regular

8.2 Irregular

**9. Type of menopause**

9.1 Natural

9.2 Surgical

**10. Duration of menopause**

10.1 < 1 year

10.2 1-4 years

10.3 > 4 years

11. When did you have your Final Menstrual Period? -----

12. Waist Circumference in cms

Measured at the highest level of iliac crest -----

13. Breast Examination – Findings -----

14. H/o Hormone Replacement Therapy -----

(a) Hormones taken

(b) Duration

15. H/o Fractures -----

16. Dietary history : caffeine intake, soft drink consumption

17. Intake of water : In litres -----

## MENOPAUSE RATING SCALE

### Purpose

This rating scale is used for assessment of the symptoms of the participants with regard to menopause among menopausal women.

### Instruction

According to the presence of symptoms scoring will be done. The information collected will be kept confidential and anonymity will be maintained.

Which of the following symptoms apply to you this time? Please mark the appropriate (✓) against each symptom. For each symptom that do not apply, please mark (✓) in 'none'.

S.No	Menopausal symptoms	None	Mild	Moderate	Severe	Very severe
1	Hot flushes Sweating (episodes of sweating)					
2	Heart discomfort (unusual awareness of heartbeat, heart skipping, heart racing, tightness)					
3	Sleep problems (Difficulty in falling asleep, difficulty in sleeping through, waking up early)					
4	Depressive mood (feeling down, sad, on the verge of tears, lack of drive, mood swings)					
5	Irritability (feeling nervous, inner tension, feeling aggressive, feeling aggressive)					

6	Anxiety ( Inner restlessness, feeling panicky)					
7	Physical and mental exhaustion (general decrease in performance, impaired memory, decrease in concentration, forgetfulness)					
8	Sexual Problems (change in sexual desire, in sexual activity and satisfaction)					
9.	Bladder Problems (difficulty in urinating, increased need to urinate, bladder incontinence)					
10	Dryness of the vagina (sensation of dryness or burning in the vagina, difficulty with sexual intercourse)					
11	Joint and muscular discomforts (pain in the joints, rheumatoid complaint)					

**Scoring key**

None – 0

Mild – 1

Moderate – 2

Severe – 3

Very Severe – 4

### Score Interpretation

<b>Score</b>	<b>Percentage</b>	<b>Categories</b>
1-11	<25	Mild
12-22	26 -50	Moderate
23-33	51- 75	Severe
34-44	>76	Very Severe

## Menopause Specific Quality Of Life (MENQOL) Questionnaire

The menopause specific quality of life (MENQOL) questionnaire is **developed by Hilditch et al.**, as a specific tool to measure the health-related quality of life in menopausal women and is also standardized. Recently, it has been translated into about 15 languages. The domains are: Vasomotor - 3 items (1-3), Psychosocial -7 items (4-10), Physical -15 (11-25) and sexual -2 items (26 and 27).

According to the presence of symptoms scoring will be done. The information collected will be kept confidential and anonymity will be maintained. Please mark the appropriate (✓) against each symptom. For completing the questionnaire, if the woman has not the symptom, she ticks “no” and if she has the symptom she indicates how bothered she is from the symptom in scoring 0-6.

For analyses, convert the item scores to the score ranging from 1 to 8 in the following manner:

The questionnaire score becomes “1” for “no,” “2” for “yes,” “not bothered” through to “8” for “yes,” “extremely bothered.”

S.No	Item	No Symptoms	Having Symptoms							
			Not at all bothered					Extremely bothered		
1.	Hot flushes or flashes		0	1	2	3	4	5	6	
2.	Night sweats		0	1	2	3	4	5	6	
3.	Sweating		0	1	2	3	4	5	6	
4.	Being dissatisfied with my personal life		0	1	2	3	4	5	6	

5.	Feeling anxious or nervous		0	1	2	3	4	5	6
6.	Experiencing poor memory		0	1	2	3	4	5	6
7.	Accomplishing less than I used to		0	1	2	3	4	5	6
8.	Feeling depressed, down or blue		0	1	2	3	4	5	6
9.	Being impatient with other people		0	1	2	3	4	5	6
10.	Feeling of wanting to be alone		0	1	2	3	4	5	6
11.	Flatulence (wind) or gas pain		0	1	2	3	4	5	6
12.	Aching in muscles and joints		0	1	2	3	4	5	6
13.	Feeling tired or worn out		0	1	2	3	4	5	6
14.	Difficulty sleeping		0	1	2	3	4	5	6
15.	Aches in back of neck or head		0	1	2	3	4	5	6
16.	Decrease in physical strength		0	1	2	3	4	5	6
17.	Decrease in stamina		0	1	2	3	4	5	6
18.	Feeling a lack of energy		0	1	2	3	4	5	6
19.	Drying skin		0	1	2	3	4	5	6
20.	Increased facial hair		0	1	2	3	4	5	6
21.	Changes in appearance, texture or tone of skin		0	1	2	3	4	5	6



22.	Feeling bloated		0	1	2	3	4	5	6
23.	Low back ache		0	1	2	3	4	5	6
24.	Frequent urination		0	1	2	3	4	5	6
25.	Involuntary urination when laughing or coughing		0	1	2	3	4	5	6
26.	Decrease in sexual desire		0	1	2	3	4	5	6
27.	Avoiding intimacy		0	1	2	3	4	5	6

### Scoring Key

No Symptoms – 1

Having symptoms (not at all bothered) (0 -4) – 2-6

Having Symptoms (Extremely bothered) (5,6) – 7,8

### Score Interpretation

Score	Percentage	Categories
1-27 ( If no symptoms in all categories)	< 12	No Symptoms
28 – 54	13 - 25	Having symptoms (Not at all bothered)
55 – 108	26 -50	Having symptoms (Bothered to an extent)
109 – 162	51- 75	Having symptoms (Bothered to a greater extent)
163 -216	>76	Having Symptoms ( Extremely Bothered)

## RATING SCALE ON LEVEL OF SATISFACTION REGARDING YOGA

### Purpose

This rating scale is designed to assess the level of satisfaction of menopausal women with menopausal symptoms regarding Yoga and this will be assessed by the researcher after Yoga intervention.

### Instruction

There are 12 items given below, kindly listen to the item, Responses extend from highly satisfied to highly dissatisfied. Describe your satisfaction regarding the Yoga. Give your response freely and frankly. The response will be kept confidential and anonymity will be maintained.

S.no	Item	Highly satisfied	Satisfied	Dissatisfied	Highly Dissatisfied
1.1	<b>Researcher interaction</b> Explanation by the researcher regarding Yoga intervention				
1.2	Communication by researcher				
1.3	Method of evaluation by researcher				
1.4	Time spent by the researcher in demonstrating Yoga				

	<b>Administration of Yoga</b>				
2.1	Ability to perform & Practice Yoga during instruction				
2.2	Duration of Yoga session				
2.3	Cost of Yoga				
2.4	Information on Menopause & Menopausal Symptoms				
2.5	Dietary Education				
2.6	Ability to Practice Yoga independently at home				
3.1	<b>Effects of Yoga</b> Reduction of vasomotor symptoms				
3.2	Reduction of Metabolic symptoms				
3.3	Reduction of urogenital symptoms				
3.4	Reduction of psychological & sexual symptoms				

**Score**

Highly satisfied -4

Satisfied -3

Dissatisfied -2

Highly dissatisfied -1

### Interpretation of score

<b>Score</b>	<b>Percentage</b>	<b>Level of satisfaction</b>
1-14	<25	Highly dissatisfied
15-28	26-50	Dissatisfied
29-42	51-75	Satisfied
43-56	>76	Highly satisfied

**ANNEXURE Q**  
**Nehahspad; tptug; gl bay;**

cqfi s , ej Matpy; gqNfwf tuNtwfNwd; , ej Matpy; gqNfwFk; mi dtUfFk; rpy tjj pKi wfs; nfhLf;fggl;LSSJ. mtwi w Ghpe;J nfhs;tJ mtrpak;

1. , ej Matpy; gqNfwgJ j qfs; tpuGgk;
2. vej Neuj j pYk; ebq;fs; Mai t tpl;L nryy mDkj pcz ;L.
3. j qfi s gwmpa tptuq;fs; ufrpakhf ghJ fhf;fggLk;
4. , ej Matpd; , ayG mj d; Mgj ;J kwWk; gad;fs; fye;J i uahl ggl ;LSSJ.
5. , ej Mai t gwmpj qfS fF VwgLk; reNj fqfi s Nfl;L tpi l mwpe;J nfhs;syhk;

**Matpd; , ayG**

, ej Mat;hdJ khj tpl ha; epWj j j j pd; mwpFwps; kD Nahfhtpd; j hf;fj ; j fz ;l wpa cj TfpuJ. Nrfhp;f;fggLk; tptuq;fs; kwWk; ghNrhj i d fs; Mat;hsh; j qfS fF Nahfh fwgpf;f cj t;ahf , UfFk; , j i d gapwrp nraj hy; khj tpl ha; epWj j j j pd; mwpFwpi s j hq;fs; fl ;LggLj j yhk;

## xgGj y;gbt k;

Mat;py; el f;Fk; nrayghLfs; vdf;F Kd;d j hf mwptpf;fggl ; J. ehd;  
, ej Nahfh rpf;ri r vd;Dk; Mat;py;Ue;J vej Neuj j pYk; t;pyf mDkj p  
nfhLf;fggl ; J. , ej Mat;py; t;ptuq;fs; Nrfhpf;fggLk;NghJ mj pf Neuk;  
nrythFk; vd;gJ Mat;hsuhy; vdf;F mwptpf;fggl ; J. Nrfhpf;fggl ; t;ptuq;fs;  
, ufr;pakhf ghJ fhf;fggLk; (kw;Wk) mi t Mat;pw;F kl ;LNk gad;gLj j ggLk; vd  
ek;Gf;Nwd;

\_\_\_\_\_ Mf;pa ehd; Mat;py; gqNfw;f xgGf;nfhs;f;Nwd;

gqNfw;ghsh; i fnahggk;  
(ngah; kw;Wk; K f t hp)

Mat;hsh; i fnahggk;  
ngah; kw;Wk; gj t p

khj t pl ha; epWj j g; ngz ;fS f;fhd Gssptptu khWghL gbt k;

gad,fs;

, ej gbt k; MathshfS fF (taJ> fy;tp j pUkz cwT> Nti y kj pgG>  
Nti yj j di k> tUkhd k> FLkg ti ffs> cz T goff tof;fq;fs> kj k) Kj ypa  
Gssptptuqfi s fz ;l wpa cj TfwwJ.

mwpt pgG

Muharrpahsh; gqNfwgth;fspl kpUe;J tptuqfi s NehKfj ;Nj h;tpd;  
%ykhf Nfs;t;pfS; Nfl ;L fz ;l wpt hh;nts;pggi l ahf> tpi l fi sj ;j Uj y;  
Ntz ;Lk;

1. khj php vz ;
2. Kfthp
3. nj hi yNgrp vz ;
4. khj t pl ha; epWj j j j pd; NghJ taJ
5. taJ (t UI k)

## 6. j pUkz cwT thof; f

6.1 j pUkz ki l ej th;

6.2 j pUkz khfhj th;

6.3 tji t

6.4 tpthfuj j hd th;

6.5 kz KwpTwwth;

## 7. fy;tp kj pgG

7.1 gbggwptwwth;

7.2 Mukg> nj hl f;fggss;pgbgG

7.3 Nkyepi yggss;pgbgG

7.4 gl j j hhp

**8. Nti y (kwWk) nj hopy;**

8.1 , yyj j urp

8.2 i fj nj hopy; nragth;

8.3 xa;T ngww gz pahsh;

8.4 kwwi t

**9. Nti yj j di k**

9.1 cl Yi oggww Nti y

9.2 Fi wej cl Yi ogGss Nti y

9.3 fbd cl Yi ogG Nti y

9.4 kwwi t

**10. khj tUkhd k;**

10.1 5000 Fi wthf

10.2 5001 - 10000

10.3 10001- 15000

10.4 15000 Nky;

**11. cz T Ki w gof;fq;fs;**

11.1 i rtk;

11.2 i rtk; kwWk; KI j l

11.3 i rtk; kwWk; mi rtk;

**12. FLkgj j pd; ti ffs;**

12.1 j d pf;FLkgk;

12.2 \$ I L f;FLkgk;

12.3 t p p thd FLkgk;

12.4 kwwi t



13. kj k;

13.1 , eJ

13.2 fwpj J tk;

13.3 K] ypk;

13.4 kwwi t

khj tpl ha; epWj j k; tej ngz fS f/fhd kUj ;J t gbt k;

gad,fs;

, ej gbt kh dJ (cauk> vi l > cl y; gUkd> , LgG RwwsT> , uj j mOj j k> ehbj ;J bgg> khgf ghNrhj i d Mfpatwi w fz ;l wpa cj Tf wJ.

1. cauk;
2. vi l
3. vi l cauk; tpfj FwpaL
4. ehbj ;J bggpd; vz z pfi f
5. , j a tphpti l j ypd; , uj j mOj j k;
6. , j a RUq;Fj ypd; , uj j mOj j k;
7. Rthrk;
8. khj tpl ha; epWj j j j pw;F Kd; , Uej khj tpl ha; Rowrp
- 8.1. tof;fkhd
- 8.2 tof;fj j pw;F khwhd
9. khj tpl ha; epWj j j j pd; ti ffs;
- 9.1 , awi f
- 9.2 mWi t rpfpr; i r
10. khj tpl ha; epWj j khfp vj j i d khj qfs; / Mz ;Lfs; .....
11. fi l rp khj tpl ha; Rowrp vgNghJ Vwgl ;l J .....
12. , LgG RwwsT nr.kP .....
13. khuG gupNrhj i d fz ;l wj y; .....
14. ` huNkhd; khw;W nj uggr nra;J s;S;fsh? .....
- 14.1. ` huNkhd; vL;f;fggl ;l J

14.2 fhvk;

15. vYkGKwpT epfoeJ ssj h?

16. cz TKi w

16.1 fhgp kwWk; B

16.2 Nfhvh mUeJj y;

17. j z z l; Fbj j y; (ypl l h) .....

18. Neha;fS;

18.1 cah; , uj j mOj j k;

18.2 ehppT Neha;

18.3 , Uj ak; rhhej Neha;

18.4 Ei ualy; rhej Neha;

18.5 , i t VJ kpyi y

khj tpyf;F epd wgp d; VwgLk; mwpFwphi s  
msf;f cj Tk;j u msTNfhy;

Nehf;fk;

, ej msTNfhy; khj tpyf;F epd w ngz ;fs;py; VwgLk; mwpFwphi s msf;f  
cj Tf<sub>pw</sub>J.

mwpTi u

Neh;fhz ypd; NghJ fNo css Nfs;t;pfS f;F j af;fk; , yyhky; gj py;  
mspf;fTk; mwpFwphi s;pd; mbggi l apy; kj pggLfs; toq;fggLk; , j d; %yk;  
fpi l f;Fk; cq;fs; gj py;fs; ufrpakhfTk; gj j pukhfTk; i t f;fggLk;

fb;f;fz l twWs; venj ej mwpFwphi s eq;fs; ngWf<sub>pw</sub>h;fs? jaT nraJ rhpahd  
tpi l f;F fl l j j py; ( ✓ ) nraaTk; mwpFwphi s; : vJ Tkpyi y> Fi wthf> kj khf>  
mj pfk hf> kpf mj pfk hf.

kj pgnz ;

t. vz ;	khj t <sub>pl</sub> ha; epWj j mwpFwphi s;	vJ Tkpyi y	Fi wthf	kj khf	Mj pfk hf	kpf mj pfk hf
1.	cl y; c\z k; ntssj j di kahj y; t <sub>ph</sub> j j y;					
2.	j a Rfkpd i k (, j aJ bgi g cz Uj y> Nt fkh d , j aJ gG> , Wf;fk)					
3.	J}f;fg; gpurri d fs; (J}f;fk; nj hl qF t j py;					

	<p>j hkj k&gt;</p> <p>t;pbawfhi ya;py;</p> <p>mbf;fb</p> <p>J }f;fj j ;ypUe;J</p> <p>vOj y; nj hl rrrpahd</p> <p>J }f;fkpd; k</p>					
4.	<p>kd mOj j cz h;T</p> <p>(cwrhfkpd; k&gt;</p> <p>Nrhfk&gt; fz ;</p> <p>f;yaqFj y&gt; ce;J j y;</p> <p>, yyhky; , Uj j y;</p> <p>nj hl hrrpahd kd</p> <p>khwwk)</p>					
5.	<p>vhrr;Yz h;T</p> <p>(gl ggl gG&gt; kd</p> <p>, Wf;fk&gt; MfNuh\</p> <p>cz h;T) eL;f;fk&gt;</p> <p>gj ww;Xat;pyyhj</p> <p>cs;S z h;T</p>					
6.	<p>gj l ;k;(cs;</p> <p>mi kj ;apd; k&gt;</p> <p>crrfl; ; gacz h;T)</p>					
7.	<p>cl y;kwWk;kd</p> <p>Nrhh;T (Fi wej</p> <p>nrayghL&gt;</p> <p>epi d f;Fi wj y&gt;</p> <p>ft d f;Fi wT&gt;</p> <p>kwj j y;</p>					

8.	cI YwT gpurri dfs; Fi wej Mhtk> Fi wej nrayghL> Fi wej kdepi wT					
9.	rpWeh;fgi g Fi wghL (rpWeh; fopggJ fbd khf , Uj j y> rpWeh; fopggj pd; mtrpak; mj pfkhfapUj j y; cz ht;pyyhky; rpWeh; fojj j y;					
10	Gz hgpi o Nahz p twl rp (tuz j cz hrrp kwWk; vhprrYz h;T> cI YwT fbd khf , Uj j y)					
11.	%l ;L kwWk;j i r gpurri dfs; (%l ;L typ kwWk; KI fF thj k)					

khj t pl ha; epWj j j j p w fhd j d p r r p w g G g z G

khj t pl ha; thot pd; j d p r r p w g G g z p p d; N f s; t p g l bay;

khj t pl ha; epWj j j j p w fhd j d p r r p w g G g z g p d; N f s; t p g l bay; , J. , t w w p d; t b t f; \$ W f s; , u j j F o h a; e u k G - 3 ( 1 - 3 ) > r % f c s t p a y; r h h e j J - 7 ( 4 - 10 ) > c l y r h h e j J - 15 ( 11 - 25 ) k w W k; g h y l g h L - 2 ( 26 - 27 ).

N k Y k; m w p F w p f s p d; g b k j p g n g z f s; t o q f g g L k; N r f u p f f g g l i n r a j p f i s u f r p a k h f T k; a h U k; m w p a h j t h W n r a y h f f g g L k; j a T \$ u e J m w p F w p f S f; N f w g m j w f h d F w p a l l i l F w p f f T k; , e j N f s; t p g l b a i y j l f f > x U n g z k z p f f v e j t j k h d m w p F w p f S k; , y i y n a d i y > ' v J T k; , y i y " v d F w p f f T k; k w W k; m t u f S f f m e j m w p F w p , U e j h y; v e j m s t p w F f t i y f; F w p a N j h m j w N f w g k j p g n g z ; t o q f g g L k; ( 0 - 6 )

t.vz ;	F w p g G	m w p F w p , y i y	m w p F w p c s s J							
			g h j p g G , y i y					k p F e j g h j p g G		
1.	c \ z g w p g G		0	1	2	3	4	5	6	
2.	, u t p y; t p a h j j y.		0	1	2	3	4	5	6	
3.	t p a h j j y.		0	1	2	3	4	5	6	
4.	R a t h o t p y; k d e p i y t p d w p , U j j y;		0	1	2	3	4	5	6	
5.	g a c z h i T		0	1	2	3	4	5	6	
6.	Q h g f k w j p		0	1	2	3	4	5	6	
7.	n t w w p f u k h a; n r a J K b j j y		0	1	2	3	4	5	6	
8.	k d m O j j c z h i T		0	1	2	3	4	5	6	
9.	g p w U l d; x j J N g h f h i k		0	1	2	3	4	5	6	
10.	j d p i k a p y; t p U g g k; n f h s; S j y;		0	1	2	3	4	5	6	
11.	t h A t y p		0	1	2	3	4	5	6	
12.	j i r t y p k w W k; % l i L t y p		0	1	2	3	4	5	6	
13.	c l y; N r h h; T		0	1	2	3	4	5	6	
14.	J q f , a y h i k		0	1	2	3	4	5	6	
15.	g p d; f O j J t y p k w W k; j i y t y p		0	1	2	3	4	5	6	
16.	c l y; g y t d k i l j y.		0	1	2	3	4	5	6	
17.	c l y; r f j p F i w j y.		0	1	2	3	4	5	6	

18.	MwWy; (rfj p) , yyhi k		0	1	2	3	4	5	6
19.	twl ;L rUkk;		0	1	2	3	4	5	6
20.	Kfj j py; Kb tshrrp \$ Lj y;		0	1	2	3	4	5	6
21.	Nj hypd; Nj hwwk; kwWk; j di kapy; khWghL		0	1	2	3	4	5	6
22.	cgGrkha; , Uj j y;		0	1	2	3	4	5	6
23.	, LgG ty		0	1	2	3	4	5	6
24.	nj hl hēJ / mbf;fb rWWh; foj j y;		0	1	2	3	4	5	6
25.	fl ;Lgghl wW rWWh; foj j y;		0	1	2	3	4	5	6
26.	cl Ywt py; <LghL Fi wj y;		0	1	2	3	4	5	6
27.	neUqfpa cwi t j tuj j y;		0	1	2	3	4	5	6



**ANNEXURE R**  
**INTERVENTION PROTOCOL**  
**YOGA FOR MENOPAUSAL SYMPTOMS**

The complete science of Yoga, has been used for the wellbeing of human beings, down the ages. Yoga will increase the elimination of toxins from the body right down the cellular levels. Breathing practices allows more oxygen in the body providing clarity to the mind. It's one of the major tools to relieve your stress and rejuvenate your body.

The Yoga therapy module is developed by the researcher on the basis of Patanjali Yoga and Hatha Yoga to address the menopausal symptoms with suitable practice of

1. Warm ups ( Hand and Leg stretches)
2. Asanas (Body Postures) : Includes Ardha kadichakrasana, Pada Hastha Asana  
Udhana Pada Asana, Pavanamuktasana, Makara Asana, , Bujangasana, Salabasana,  
Janusirasana, balasana , Utiana Bandha
3. Cool Down Asanas : Pranayama - Nadi Shudhi (alternate nostril) and Sheethali  
through tongue) , Dhyana (concentrates breathe in meditative pose in Ardha  
Padmasana or Sukhasana) and Shanthiasana (deep relaxation in corpse pose)

The Yoga practices were demonstrated by the researcher and the subjects are expected to perform and practice the same in front of the researcher. The intervention was planned for 6weeks which began by collecting the baseline data, teaching and practicing respective protocol for 45 minutes every day. The follow ups and post interventional data were assessed after 6 weeks of practice. The study included 228 post menopausal women, 108 in Yoga group and 120 in Non -Yoga group from the selected Primary Health Centres. Formal permission for utilisation of the population under the selected Primary Health Centres were

obtained from the DDHS, Thiruvallur District. The samples were chosen by cluster sampling technique with randomization. The permission for the space chosen were obtained from the concerned local leaders / influential persons and the owners of the space.

### **Yogasanas included**

- Hand and Leg stretches
- Ardhakadi Chakrasana
- Pada Hastasana
- Udhana Padasana
- Pavanamuktasana
- Makarasana
- Bhujangasana
- Salabhasana
- Janusirasana
- Balasana
- Utianabandha
- Nadishudhi Pranayama
- Sheethali Pranayama
- Dhyana (Meditation)
- Shanthiasana

### **1. Hand and Leg Stretches**

#### **1.1 Leg Stretches**

Sit up with hands behind, legs outstretched.

Stretch 1 - Bend toes forward and bend toes backward.

Stretch 2 – Bend the feet forward and bend the feet backward

Stretch 3 – Rotate the feet clockwise and anti clockwise

Stretch 4 – keep left leg on the right thigh; with hands turn left foot clockwise & anti clockwise . repeat with other leg

Stretch 5 – Turn the feet gently to the right and then to the left.

## 1.2 Hand Stretches

Stretch 1 – Stretch your hands in front of you with palms facing outward and then inward. Repeat

Stretch 2 – Stretch your hands in front of you. Close your fingers and make a fist then open it slowly. Repeat

Stretch 3 – Arms still outstretched, close your fingers into a fist and make a circle at the wrists, both clockwise and anti-clockwise.

Stretch 4 – Stretch your hands by keeping them inside out. Make a fist with your fingers , fold your arms at the elbow and draw your hands up to shoulders.

Stretch 5 - Stretch your hands by keeping them inside out. Bring your fingers together , now fold your arms at the elbow and draw up your hands so that your fingers reach the shoulder. Now revolve arms from front to back and back to front.

## 1.3 Hand and leg stretch poses





## 2. Ardhakati Chakrasana

"ArdhakatiChakrasana" is famous as half wheel pose as well. The bend from the waist sideways in this asana resembles the wheel. The name of the Asana is derived from the words Ardha, meaning half, Kati, meaning waist and Chakra, which means wheel. It is one of the most common Asanas that are used for general body toning on a day to day basis"

### 2.1 Steps

- 2.1.1 While standing, your feet should be placed together, and the hands should be stretched out along the thighs. This step in itself is an Asana known as Tadasana.
- 2.1.2 The right hand should be raised vertically, and you should breathe in during this step.
- 2.1.3 The right hand should be stretched as much as possible, following which the body is to be bent towards the left, while exhaling.
- 2.1.4 Once the final posture is reached, maintain regular breathing. The posture should be maintained for 30 seconds.
- 2.1.5 The same action should be repeated for the other side.

## **2.2 Benefits**

- 2.2.1 Practitioners of this Asana have reported relief from constipation issues, especially if it is practiced during the morning hours.
- 2.2.2 The back muscles are exercised and this leads to their strengthening.
- 2.2.3 It is a very useful posture for people with excessive fat, especially around the waist region.
- 2.2.4 Daily practice of this Asana can lead to more flexible hip joints than ever before.
- 2.2.5 Asthma and high blood pressure, two common medical problems of the modern world, can be controlled through this Asana.

## **2.3 Ardha kadi Chakrasana Pose**



## **3. Pada Hastasana**

### **3.1 Steps**

- 3.1.1 Keep the feet close together and stand erect

- 3.1.2 Exhale, relax the body, raise arms, bend forward, and hold your big toe with your fingers
- 3.1.3 Knees should be straight
- 3.1.4 Bring your chin to the knees
- 3.1.5 If it is difficult to bring the face forward all the way down while holding your big toes, hold the ankles instead
- 3.1.6 Hold for 10 - 15 seconds
- 3.1.7 Repeat thrice.

### **3.2 Benefits**

- 3.2.1 Back muscles become strong and flexible.
- 3.2.2 Reduces back and leg pain.
- 3.2.3 Massaging the abdominal muscles has a revitalizing effect.
- 3.2.4 Stomach ailments will disappear.
- 3.2.5 Brings a youthful glow to the face.

### **3.3 Padahastasana Pose**



## 4. Udhana Padasana

### 4.1 Steps

- 4.1.1 Lie on your back, with your palms on the floor, by the side of your body and close it.
- 4.1.2 Slowly raise both legs, and without stiffening lift them upto 1-2 inches off the floor initially and later try lifting upto 4 inches.
- 4.1.3 Stay in this position for 10 – 20 seconds, then put your legs down slowly
- 4.1.4 Breathe normally, although in the beginning you may be holding your breath.
- 4.1.5 Repeat thrice.

### 4.2 Benefits

- 4.2.1 Your abdomen will get flatter and the waistline gets smaller.
- 4.2.2 Digestive organs will contract and begin to work well.
- 4.2.3 From head to toe, all the nerves in the body are activated.
- 4.2.4 Gas trouble will recede.
- 4.2.5 Ideal for women who would like to reduce their waist line.

### 4.3 Udhana padaasana Pose



## 5. Pavanamuktasana

Is otherwise called as wind releasing pose

### 5.1 Steps

- 5.1.1 Lie down on your back
- 5.1.2 Fold right leg, bind knee over stomach with hands and raise head
- 5.1.3 Next, fold left leg, bind knee over stomach with hands and raise head
- 5.1.4 Fold both legs, bind knees over stomach with hands, and raise head.
- 5.1.5 Repeat thrice.

### 5.2 Benefits

- 5.2.1 It encourages blood to flow freely to all nerves in the body
- 5.2.2 Yoga scriptures claim that those who practice this asana regularly will be clear and calm in thinking
- 5.2.3 This asana helps stabilize blood pressure

### 5.3 Pavanamukthasana Pose





## 6. Makarasana

### 6.1. Makarasana- the meaning

“Makara” means crocodile.

While doing this asana, body resembles the shape of a crocodile.

Hence it is known as Makarasana

### 6.2 Steps

Lie on your abdomen

Take both your hands from either side and keep them under the chin

Now lie either chin over the hands or cheek over the hands

### 6.3 Benefits

The intestine will be suspended in a relaxed state and hence gets soothing effect.

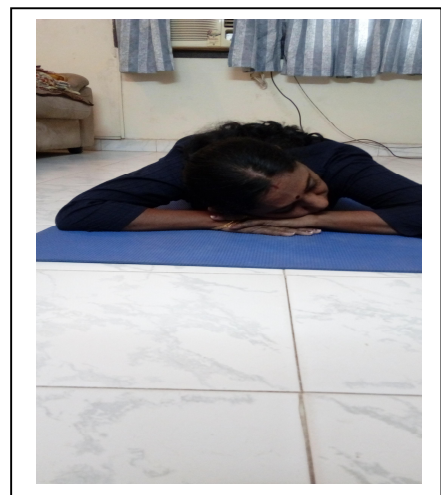
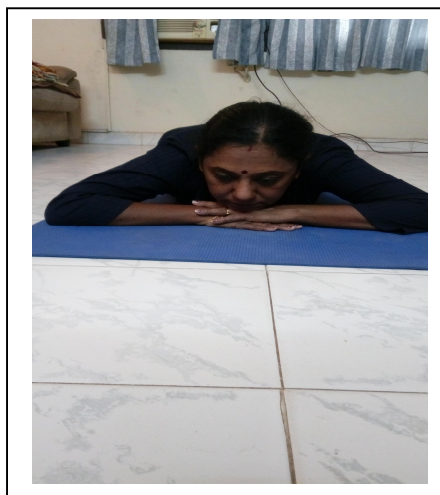
This improves digestive process.

This asana relaxes the individual and promotes sleep

Excellent remedy for flatulence and intestinal spasms

It is also a good remedy for anxiety neurosis

### 6.4 Makarasana Pose



## 7. Bhujangasana

### 7.1 Steps

- 7.1.1 Lie on your chest with palms down, and fingertips in line with the shoulder
- 7.1.2 Applying minimum pressure on your hands, raise your head high and bend back like a snake
- 7.1.3 Breathe normally
- 7.1.4 Then lower your head slowly.
- 7.1.5 Hold for 15 seconds and repeat 3 times.

### 7.2 Benefits

- 7.2.1 As your stomach muscles are pulled, blood flows freely through the front of the body
- 7.2.2 The backbone gets stronger
- 7.2.3 When the chest expands, the ribs get strengthened
- 7.2.4 This is an important asana in the cure of asthma

### 7.3 Bhujangasana Pose



## **8. Salabasana**

### **8.1 Steps**

- 8.1.1 Lie on your chest, keep your face low down on the mat
- 8.1.2 Let the palm face downward, and tucked under the abdomen
- 8.1.3 Inhale and hold your breath, press your palms on the floor and raise your legs straight up
- 8.1.4 Hold for 5 – 10 seconds at a time
- 8.1.5 Lift the legs as far back and up as possible, and let it drop slowly
- 8.1.6 In the beginning, practice raising one leg at a time.
- 8.1.7 Repeat thrice

### **8.2 Benefits**

- 8.2.1 Strengthens abdominal muscles. Pulls the intestines upward and improves its function.
- 8.2.2 Relieves constipation
- 8.2.3 The waistline gets smaller when the abdomen is pulled up
- 8.2.4 Spine and vertebrae gets strengthened

### **8.3 Salabasana Pose**

## **9. Janusirasana**

### **9.1 Steps**

- 9.1.1 Sit upright, raise arms and spread your legs as wide as possible
- 9.1.2 Fold the left leg, with your heel touching the anus
- 9.1.3 With your right palm hold the right foot as you bend over
- 9.1.4 Your face should touch the knee
- 9.1.5 Do the same with the other leg

9.1.6 Stay in this position for 5 to 15 seconds

9.1.7 Repeat thrice

## **9.2 Benefits**

9.2.1 The sides of your rib cage gets stronger

9.2.2 Indigestion and gas troubles recede, and the body becomes flexible

9.2.3 The middle part of the body is strengthened

9.2.4 Back and hip pain will reduce

9.2.5 Urinary sphincter and anal sphincter musculature gets strengthened

## **9.3 Janusirasana Pose**



## **10. Balasana**

### **10.1 Purpose**

Is one of the best known yoga relaxation and meditation.

Balasana is also one of the best yoga for hypertension.

### **10.2 Steps**

With your legs on the floor, bend your knees.

Now rest your chest on your knees

And stretch you head forward towards the ground

Let your fore head touch the ground if possible

Stretch your arms forward as shown in the image

Remain in this pose for about five to six minutes while taking deep breaths

### **10.3 Benefits**

Promotes sleep and relaxation

Prevents and controls stress

Provides peace and prevents restlessness

Controls hypertension

### **10.4 Balasana Pose**



## **11. Utianabandha**

Utiana should only be practiced on an empty stomach

### **11.1 Steps**

Keep the legs one foot apart

With your hands on your thighs and knees slightly bent.

Bend the body forward

Exhale completely.

Tuck in your stomach, press the hands on the thigh

Force your intestines up.

Perform this asana very gently and without haste

Hold for 5 seconds, then relax

Repeat 3 times

### **11.2 Benefits**

Regulates urinary and anal sphincter control

Prevents urgency and stress incontinence

Reduces extra fat around the abdomen

Strengthens inner organs of the abdomen

### **11.3 Utiana Bandha Pose**



## **12. Nadishudhi Pranayama**

### **12.1 Technique**

Sit in meditative posture, close the eyes and relax.

With the help of Nasik mudra close the right nostril with right hand thumb

Inhale through left nostril and close it with 1<sup>st</sup> and 2<sup>nd</sup> finger

Hold the breath according to your capacity

Now slowly exhale through the right nostril

After this , alternate with the opposite nostril breathing

This is one round of Nadishuddhi Pranayama

### 12.2 Benefits

It clears the blockage in pranic flow thus reducing stress.

It gives energy to the body and increases efficiency of brain

### 12.3 Nadi Shuddi Pranayama Poses



### 13. Sheetal Pranayama

This pranayama cools the system as the name indicates

#### 13.1 Technique

Protrude the tongue a little away from the lips.

Fold the tongue like a tube, Draw in the air through mouth

Retain the breath as long as you can hold on with comfort

Exhale slowly through both nostrils.

Practice this daily again and again in the morning from 15 to 30 times.

Can do this in Padmasana, Siddhasana, Vajrasana or when you stand or walk.

#### 13.2 Benefits

Purifies the blood.

Cools the whole body

Quenches thirst

### **13.3 Sheethali Pranayama Pose**



## **14. Meditation or Dhyana**

Control of mind and its thought is meditation. Its principle is to develop internal awareness

### **14.1 Steps / Technique**

Select calm, clean and ventilated place.

Keep your trunk, neck, and head straight.

Rest your wrist on the folded knees and keep palms up.

Touch your index finger with the thumb.

Keep remaining fingers open and downward.

Close your eyes. Keep your body absolute without movement

### **14.2 Benefits**

Increases calmness of mind, steadiness & one point awareness.

Increases peace in our day-to-day life.



### 14.3 Meditation or dhyana Pose



### 15. Shanthiasana

This posture is called Shanthiasana as it gives peace or Shanthi to the one who does it. In Sanskrit “Shava” means “dead body”. The posture is also called Shavasana as it resembles a dead body.

#### 15.1 Technique

The person has to lie on his or her back with legs and hands relaxed for over a period of time

#### 15.2 Benefits

It gives rest to the whole body. Removes physical and mental fatigue.

Gives a sense of relaxation and feeling of freshness

It is very beneficial in high blood pressure and cardiac disease.

This asana is beneficial for those suffering from neurosis and fear psychosis

Regular practice of any relaxation technique or meditation will help you to improve your sleep.

### 15.3 Shanthiasana Pose



## ANNEXURE S

### CHECK LIST FOR ASSESSING THE INTERVENTION FIDELITY OF THE RESEARCH

S.L	Criteria for Intervention fidelity		Approaches for meeting the criteria for Intervention fidelity	Present	Absent
1.	Study design	Eliminate contamination	<ul style="list-style-type: none"> <li>• Randomisation</li> <li>• Random assignment</li> <li>• Selection of study subjects free from bias</li> <li>• Structured inclusion and exclusion criteria</li> <li>• Inclusion and Exclusion criteria equally applied to all study participants</li> </ul>		
		Intervention and control sufficiently different, yet similar to avoid bias	<ul style="list-style-type: none"> <li>• Consent wording</li> <li>• Post assessment</li> <li>• Protocol same for both the groups</li> </ul>		
2.	Treatment and its delivery	Intervention delivered as intended	<ul style="list-style-type: none"> <li>• Similar No. of participants in all intervention sessions</li> <li>• Similar duration of Intervention</li> <li>• Standardised intervention package</li> <li>• Reinforcement of</li> </ul>		

			<p>Intervention at regular intervals</p> <ul style="list-style-type: none"> <li>• Intensity and duration of the Intervention sufficient to produce meaningful effect</li> <li>• Standard, valid, reliable data collection instrument used</li> <li>• Measurement of effect at an appropriate level of precision</li> <li>• Control of other factors accounted for outcome effect</li> </ul>		
3.	Treatment Intervention receipt	<p>Ensure participants can understand intervention and control instruction</p>	<ul style="list-style-type: none"> <li>• Confirming receipt of the treatment</li> <li>• Periodical demonstration</li> <li>• Verify ability to understand and follow instructions</li> </ul>		
		<p>Ensure participation can understand perform, skill interventions</p>	<ul style="list-style-type: none"> <li>• Outcome measures studied</li> <li>• Evaluate the difficulties faced during intervention</li> <li>• Ensure instructions are understood</li> <li>• Similar tools used for assessment of variables</li> </ul>		

4.	Treatment enactment	Ensure participants are able to perform skills	<ul style="list-style-type: none"> <li>• Ongoing observation</li> <li>• Presence of investigator to perform the intervention</li> <li>• Correcting mistakes and motivating participants</li> </ul>		
5.	Provider training	Adequate training received on the intervention by the investigator and co investigator	<ul style="list-style-type: none"> <li>• Investigators and co investigators duly qualified in rendering interventions</li> <li>• Co-Investigators received adequate training and confident enough to render interventions</li> </ul>		

### Scoring interpretations:

Each Approaches when present is given a score of '1'. If absent, score given is '0'

Scores for intervention fidelity	Percentage	Remarks
0-10	0-33%	Poor Intervention fidelity
11-20	34-67%	Average Intervention fidelity
21-30	68-100%	Good Intervention fidelity

## ANENXURE T

### CERTIFICATE FOR PARTICIPATING IN INDIAN MENOPAUSE SOCIETY CONDUCTED CME/ ACTIVITIES

#### CERTIFICATE OF PARTICIPATION

This is to certify that **Mrs. Shobana Gangadharan**, life member of Indian Menopause Society, working as Professor, Apollo College of Nursing, Chennai, and Ph.D Candidate in The Tamil Nadu Dr. M.G.R Medical University, Chennai has participated in the following Indian Menopause Society organised CME / events . I wish her all the success in her career.

S.No	Date	Title of the Event / CME	Organised/ Participated	Venue
1.	22/08/2013	CME on Breast and Hormones	Participated	Hotel Ramada Inn, Egmore, Chennai
2.	27/10/2013	CME on Menopausal Health	Participated	Hotel Residency towers, T.Nagar, Chennai
3.	02/03/2014	Health Camp for Midlife Women	Organised	Perumalagaram, Thiruverkadu
4.	20/07/2014	Had been a part of PAN India survey conducted by Indian Menopause Society covering east, west, north, south and central regions on Age at menopause and determinants of menopausal age.	Collected data for Chennai chapter, Southern region.	Ayanambakkam, Rajankuppam

5.	09/08/2014	CME on Coronary Heart Disease and Menopause	Participated	Hotel Ramada Inn, Egmore, Chennai
6.	24/09/2014	CME on Menopause and Osteoporosis – “Stand tall, Support your bones, they would support you”	Participated	Hotel Ramada Inn, Egmore, Chennai.
7.	10/05/2015	CME on Midlife women’s Health	Participated	Hotel Ramada Inn, Egmore, Chennai
8.	27/02/2016	CME on Save the Uterus – Tribute on Midlife Uterine bleeding	Participated	Apollo Hospitals Greams Road Chennai.

*Vijayalakshmi Seshadri*  
 DR. VIJAYALAKSHMI SESHADRI  
 M.S. FICOG, FRCMCH  
 CIMP.  
 CHAPTER Secretary

**Indian Menopause Society**

**Chennai Chapter**



ANNEXURE U

CERTIFICATES FOR PARTICIPATING / PRESENTING IN RESEARCH/ YOGA

WORKSHOP / CONFERENCE



The Tamil Nadu Dr. M.G.R. Medical University

69, Anna Salai, Guindy, Chennai - 600 032.

CME - 30 CREDIT POINTS

This Certificate is awarded to *Dr. / Mr. / Ms. ...S.HOBANA...G.*.....

for participating in the **XXX** Workshop on  
**Research Methodology & Biostatistics**

as

**Resource Person / Participant**

organized by the Department of Epidemiology,

The Tamil Nadu Dr. M.G.R. Medical University

from 18<sup>th</sup> to 22<sup>nd</sup> November 2013



*J*

Prof. Dr. JHANSI CHARLES, M.D.,  
REGISTRAR

*Shantaram*

Prof. Dr. D. SHANTHARAM, M.D., D.Diab,  
VICE - CHANCELLOR







## Conference on Stress Reduction Skills : Scientific Update



30<sup>th</sup> and 31<sup>st</sup> August, 2014

Ms. Shobana. G has been awarded for the best poster 'Effect of Tratak Guided Meditation Technique on Stress and Concentration among adolescent girls in Apollo College of Nursing, Chennai' in this conference organized by the Department of Psychiatry, All India Institute of Medical Sciences, New Delhi and the Sri Sri Global Meditating Doctors Association at Indian Institute of Technology, New Delhi.

This CME program has been accredited by the Delhi Medical Council vide Ref. No. 2049/CME/16C/2/2014 Dated 31st July, 2014 for Six hours and 20 minutes.

Dr. S K Khandelwal  
Co-Chairperson

Dr. Anju Dhawan  
Organizing Secretary



# Conference on Stress Reduction Skills : Scientific Update

30<sup>th</sup> and 31<sup>st</sup> August, 2014

Dr. / Ms / Mr Prof. Shobana Gaugadhara..... has participated as a delegate/speaker/  
chair person in this conference organized by the Sri Sri Global Meditating Doctors Association and the  
Department of Psychiatry, All India Institute of Medical Sciences, New Delhi, at Indian Institute of  
Technology, New Delhi.

This CME program has been accredited by the Delhi Medical Council vide Ref. No.  
2002049/CME/16C/2/2014 Dated 31st July, 2014 for 6 hours 20 minutes.

*Vinod Kochupillai*

**Dr. Vinod Kochupillai**  
Chair person

*S K Khandelwal*

**Dr. S K Khandelwal**  
Co-Chairperson

*Anju Dhawan*

**Dr. Anju Dhawan**  
Organizing Secretary



# Total Innovation Management

A drive for competitive success

8<sup>th</sup> INTERNATIONAL NURSING CONFERENCE - 2015

This is to certify that

Dr./Mr./Ms. **SHOBANA GIANGADHARAN** .

has been a Delegate / ~~Resource-Speaker~~ / ~~Moderator~~ at the 8th International Nursing Conference on

“Total Innovation Management: A Drive for Competitive Success”

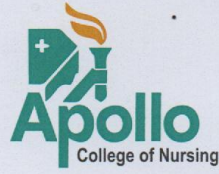
Organized at Apollo College of Nursing, Chennai,  
11th & 12th June 2015 and presented a paper on

**YOGA NIDRA POWERED - A PRODUCT INNOVATION  
IN THE FIELD OF NURSING PRACTICE.**

TNMMC awarded credit hours 16

**Mr. V. Satyanarayana Reddy**  
Chief Operating Trustee

**Dr. Latha Venkatesan**  
Principal



## State Level Workshop

**This is to certify that**

Dr./Mr./Ms... Shobana G .....

has been a Delegate at the State Level workshop on

**“Construction and Standardization of Research Questionnaire”**

Organized by Apollo College of Nursing, Chennai, on 24.11.2016.

Tamil Nadu Nurses and Midwives council awarded

Credit hours 5

**Mr. V. Satyanarayana Reddy**  
Chief Operating Trustee

**Dr. Latha Venkatesan**  
Principal



The Tamil Nadu Dr. M.G.R. Medical University

69, Anna Salai, Guindy, Chennai - 600 032.

CME - 10 CREDIT POINTS

This Certificate is awarded to Dr. / Mr. / Ms. ....*Shehana Gangaacharan*.....

for participating in the IV Workshop on  
'Introduction to Scientific & Medical Writing'  
organized by the Department of Epidemiology,

The Tamil Nadu Dr. M.G.R. Medical University on 30<sup>th</sup> August 2013

Prof. Dr. JHANSI CHARLES, M.D.,  
REGISTRAR

Prof. Dr. D. SHANTHARAM, M.D., D.Diab.,  
VICE - CHANCELLOR



**Apollo College of Nursing, Ayanambakkam**

**Chennai - 600 095**

**This is to certify that**

**Ms /Mrs/Mr. SHOBANA . G.....**

**(RN.....42331....., RM.....49081.....) was /Resource Person / has**

**participated in the workshop on**

**“RESEARCH METHODOLOGY”**

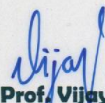
**at Apollo College of Nursing, Chennai – 95**

**from 14.10.2013 to 18.10.2013.**

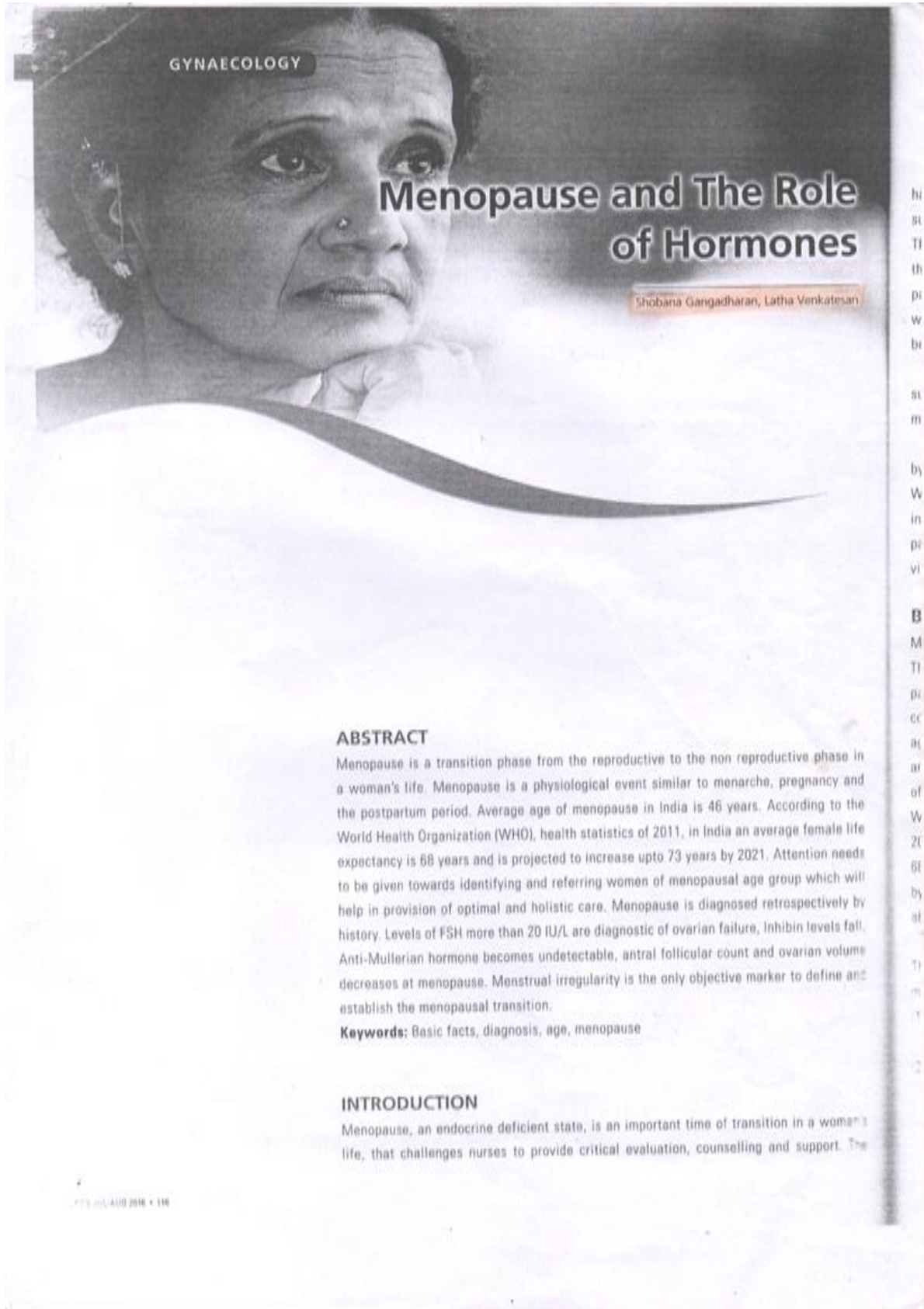
**Credit hours awarded by the Tamil Nadu Nurses &**

**Midwives Council is 30 with 15 Credit points.**  
**HRS**

  
**Dr. Latha Venkatesan**  
**Principal & Organizing Chairperson**

  
**Prof. Vijayalakshmi.K**  
**Organizing Secretary**

**ANNEXURE – V**  
**THESIS RELATED PUBLICATIONS**



hallmark of menopause is ovarian senescence and the subsequent decrease in estrogen and progesterone. This decline is accompanied by changes throughout the body. Just as Menarche and Pregnancy, menopause, another physiologic state in the life of a woman can be extremely symptom producing and may be perceived as illness.<sup>1</sup>

"There is nothing to compare with the almost sudden decay of the organs of reproduction which marks the middle age of woman" – Barnes, 1873.

The term menopause was first invented in 1821 by French MD Gardanne. Menopause is defined by WHO as Permanent cessation of menstruation resulting from loss of ovarian follicular activity. The menopause is an important crossroads in our lives and, if viewed positively, can be rewarding and revealing.<sup>2</sup>

### BASIC FACTS ABOUT MENOPAUSE

Menopause generally occurs between 45-55 years. The average age when woman experience the menopause is 51 years globally an age that has remained constant over centuries, even though the average age for the onset of menstruation has become earlier and <10% reach menopause before 46. Average age of menopause in India is 46 years. According to the World Health Organization (WHO), health statistics of 2011, in India an average female life expectancy is 68 years and is projected to increase up to 73 years by 2021. Menstruation stops before 45<sup>th</sup> birthday for about a third of all women.<sup>3</sup>

There are two factors that may influence the time of menopause:

- 1) The age you begin to menstruate may affect the age that you experience the menopause.
- 2) The age at which your mother experienced menopause will have some bearing on when you stop menstruating, but again this relationship has not been significantly proven.

### MENOPAUSE AND LONGEVITY

Women live the longest after menopause relative to their total life span, when compared with all other mammals. During the 20<sup>th</sup> century longevity for women has increased two-fold. More than 33% of a woman's life remains after the cessation of menses.<sup>4</sup>

### DIAGNOSIS / CONFIRMING PERIMENOPAUSE

The test for perimenopause is clear-cut. (i) 12 months without a period (ii) FSH and LH in the menopausal range. The best way a doctor determines whether the patient is in perimenopause is to take a thorough medical history, reviewing all the symptoms and perform a physical exam. A blood or saliva test to check the levels of hormones progesterone, estradiol, FSH and LH can confirm the doctor's diagnosis but should not be relied upon 100%. Because perimenopause is characterized by hormonal fluctuations, so a blood or saliva test of your hormones could indicate normal levels even if you are in menopause. But the same test performed next month could show your hormones to be completely out of whack.

The reason that hormone levels may swing in and out of the normal range in perimenopause is that they are determined by the condition of the particular follicle that matures each month i.e., if the woman happens to release a healthy egg, her circulating *estrogen, progesterone, FSH, LH* and *Inhibin* levels will be normal; if instead she releases a wornout egg, her hormone levels will be in the perimenopausal range.

Of all these hormones, Inhibin is the most sensitive marker of follicular health. But as of yet, there is no known way to measure inhibin levels. Instead we measure circulating FSH levels because without adequate inhibin, FSH is released in greater than normal amounts. FSH levels more than 20 IU/L are diagnostic of ovarian failure in the perimenopausal age group with vasomotor symptoms even in the



absence of cessation of menstruation. In other words, as your inhibin goes down, your FSH goes up. To determine a patient's FSH level, blood sample should be drawn on the third day of her cycle.<sup>5</sup>

Estrogen is really an umbrella term. Each of its 3 major types play a distinct role in the body – Estrone (E1), Estradiol (E2) and Estriol (E3).

**Estrone (E1)** a weaker estrogen, is the main form of estrogen after menopause. It is produced in fat cells from the male hormone androstenedione. Obese women of any age have high levels of estrone. During your reproductive years, your ovaries and liver produce small amounts of estrone from estradiol. **Estradiol (E2)** is the predominant form of estrogen circulating in your body from menarche to menopause and therefore the one that we test when we do hormone studies. There are estradiol receptors on virtually every cell in your body – not just your reproductive organs – including your brain, skin, hair, heart, liver, blood vessels, bones, breasts, vagina, bladder, colon, uterus and thyroid gland. That is why when you enter perimenopause and your estradiol levels fluctuate, you may experience a wide range of physical, mental and emotional symptoms. **Estriol (E3)** – Estriol is only produced in significant amounts by the placenta during pregnancy. The reason pregnant women glow and have thick lustrous hair is because estradiol receptors are mostly found in skin, hair and vaginal tissues.<sup>5</sup>

To determine a patient's FSH level, blood sample should be drawn on the third day of her cycle. To find out her serum levels of progesterone, draw blood either 10 days after she has ovulated (or) 4 days before she expects her next period.

Saliva testing of hormone levels is becoming increasingly popular, as it is simple and painless: all

you need to do is to spit into a test tube during the 2nd half of your cycle (around days 20 – 23 of a 28 days cycle). The drawback of saliva testing is that at present it can only be used to measure estrogen, progesterone and testosterone levels, not FSH or LH. Other important hormones to have checked in perimenopause are TSH (Thyroid Stimulating Hormone), Free T4 and Prolactin levels, as well. As thyroid disease often sets in when women reach their forties and early fifties and it can affect the menstrual cycle in a way that mimics perimenopause. If thyroid is a culprit, your period should return to normal as soon as its treated.<sup>5</sup>

## CONCLUSION

In menopausal women, hormone alterations often result in unpleasant physical, psychological and sexual changes, which can have a negative impact on their quality of life. Nurses working in Community setting and OG setting need to gain knowledge on menopause, an important transitional period in the life of a woman and further develop attitude and skills with regard to practice. Women in this stage of life get minimal attention and care, their problems are less spoken out by themselves as menopause is considered normal almost always. Considering the present day life style and the multi faceted roles of women at home and work, it is of great need to inform, orient and create awareness on the strategies to overcome the menopausal symptoms.

## About the Authors

Mrs. Shobana Gangadharan is Ph.D Scholar in Obstetrics and Gynecology and Dr. Latha Venkatesan is Principal and Professor in Obstetrics & Gynecology Nursing, Apollo College of Nursing, Chennai, India

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Menopausal symptoms	Control group n=30		Experimental group n=30		t value
	M	SD	M	SD	
<b>Before Administration</b>					
Physiologic symptoms	18.9	3.53	20.8	2.80	2.11
Psychologic symptoms	20.16	2.32	20.46	3.56	2.06
<b>After Administration</b>					
Physiologic symptoms	18.7	3.54	14.4	4.66	4.12***
Psychologic symptoms	20.16	2.40	13.56	4.81	4.48***

\*\*\*p<0.001

The data presented in the above table inferred that the difference in mean and standard deviation of physiological symptoms (M=18.9, 20.8, SD=3.53, 2.80) and psychological symptoms (M=20.16, 20.46, SD= 2.32, 3.56 ) before administration of soya milk between control and experimental group of menopausal women is not statistically significant ( $p<0.05$ ). Whereas the difference in mean and standard deviation of physiological symptoms (M=18.7, 14.4, SD=3.54, 4.66) and psychological symptoms (M=20.16, 13.56, SD= 2.40, 4.81) after administration of soya milk between control and experimental group of menopausal women is statistically significant ( $p<0.001$ ).

There is significant reduction of physiological and psychological symptoms in experimental group after soya milk administration which can be attributed to the effectiveness of soya milk. Hence null hypothesis  $H_0$ , "There will be no significant difference in menopausal symptoms before and after administration of soya milk between control and experimental group of menopausal women" was rejected.

### Conclusion

The findings of the study showed that the effectiveness of soya milk upon menopausal symptoms in experimental group was better than those in the control group. Hence it could be concluded that there is an association between the menopausal symptoms and

administration of soya milk. Soya milk is easy to administer and a natural supplement for menopausal women, which can also be prepared at home and consumed.

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- Aaron, R.&Mulyil,J.(2002).Medical social dimensions of menopause.National Medical Journal of India, 15(1), 14-17.
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- Shah, R.et al (2004).Menopausal symptoms in urban Indian women, Obstetrics & Gynecology Today, 9(10), 667-670.

4. To determine the level of satisfaction regarding the administration of soya milk in the experimental group of menopausal women.

#### Null hypotheses

Ho, There will be no significant difference in menopausal symptoms before and after administration of soya milk between control and experimental group of menopausal women.

Ho, There will be no significant association between selected demographic variables and menopausal symptoms in control and experimental group of menopausal women.

Ho, There will be no significant association between selected clinical variables and menopausal symptoms in control and experimental group of menopausal women.

#### Research Methodology

An experimental approach was adopted for the study and the research design monograph was

Control group:	R	O <sub>1</sub>	-	O <sub>2</sub>
Experimental group:	R	O <sub>1</sub>	X	O <sub>2</sub>

R- Randomization

O<sub>1</sub>- Pre assessment of menopausal symptoms

O<sub>2</sub> - Post assessment of menopausal symptoms

X -Intervention (administration of soya milk)

Setting: The study was conducted at Rajankuppam, Chennai.

Sample and sampling technique: Simple random sampling was chosen where lottery method was used to assign the subjects 30 in control and 30 in experimental group.

Tools: The study instruments are demographic variables, clinical variables, structured knowledge questionnaire, rating scale on level of menopausal symptoms and level of satisfaction regarding administration of soya milk.

Data collection procedure: Survey method was used to assess the prevalence of menopause. After which menopausal symptoms were assessed in control and experimental group using rating scale. Menopausal women in the experimental group were administered (house to house) 100 ml of soya milk in midmorning daily for 4 weeks. At the end of 4 weeks symptoms were assessed for both control and experimental group by using rating scale. The level of satisfaction on administration of soya milk was assessed by using the rating scale in the experimental group. The collected data were tabulated and analyzed using descriptive and inferential statistics.

#### Results And Discussion

Table 1: Comparison of Mean and Standard deviation of Menopausal symptoms before and after administration of soya milk between Control and Experimental group of Menopausal women.

## EFFECTIVENESS OF SOYA MILK UPON MENOPAUSAL SYMPTOMS

Ms. Lourds Bemig., M. Sc (N) II year, Dr. Latha Venkatesan, Principal,  
Mrs. Shobana.G., Professor, Apollo College of Nursing, Chennai

### Abstract

A experimental study was conducted among 60 samples to assess the effectiveness of Soya milk upon Menopausal symptoms among Menopausal women in selected wards of Thiruverkadu Township. Survey method was used to assess the prevalence of menopause and following this menopausal symptoms were assessed in control and experimental group using rating scale. Menopausal women in the experimental group were administered (house to house) 100 ml of soya milk in midmorning daily for 4 weeks. At the end of 4 weeks symptoms were assessed for both control and experimental group by using rating scale. The level of satisfaction on administration of soya milk was also assessed by using the rating scale in the experimental group. The results revealed that there was a significant reduction of physiological and psychological symptoms in experimental group after soya milk administration which can be attributed to the effectiveness of soya milk.

**Key words:** Menopause, Soya milk

### Introduction

The word "Menopause" literally means the "end of monthly cycles. It is the permanent cessation of menses associated with declining ovarian function. A woman's ovaries have two hormones estrogen and progesterone, when these hormones are out of balance, hormone related illness can emerge.

Due to hormonal changes women notice hot flashes, night sweat, insomnia, vasomotor changes. They may vary in intensity from a barely perceptible warm feeling to sensation of extreme warmth accompanied by profuse sweating, causing discomfort, sleep disturbance and subsequent fatigue. The entire genito urinary system is affected by the reduced estrogen level.

Soy milk contain isoflavones which are referred to as phytoestrogens and have the most potent estrogen like activity of all common phytoestrogens Soy beans and other legumes contain isoflavones and are an important source of dietary phytoestrogens. There are many different isoflavones found in plants.

Women hesitate or neglect to discuss the physiologic and psychological changes and due to family commitments may avoid to aid pharmacological management therefore automatically she turn towards home remedies which is alternative and complementary therapies because of its cost effectiveness (without side effects).

### Statement of the problem

An Experimental Study to Assess the Effectiveness of Soya milk upon Menopausal symptoms among Menopausal women in Selected wards of Thiruverkadu Township.

### Objectives of the study

1. To assess the prevalence of menopausal symptoms among menopausal women in selected wards of Thiruverkadu Township.
2. To assess the level of knowledge regarding menopause in control and experimental group of menopausal women.
3. To determine the effectiveness of soya milk by comparing the menopausal symptoms in control and experimental group of menopausal women.

Menopausal symptoms	Control group n=30		Experimental group n=30		T value
	M	SD	M	SD	
<b>Before Administration</b>					
Physiologic symptoms	18.9	3.53	20.8	2.80	2.11
Psychologic symptoms	20.16	2.32	20.46	3.56	2.06
<b>After Administration</b>					
Physiologic symptoms	18.7	3.54	14.4	4.66	4.12***
Psychologic symptoms	20.16	2.40	13.56	4.81	4.48***

\*\*\*p<0.001

The data presented in the above table inferred that the difference in mean and standard deviation of physiological symptoms (M=18.9, 20.8, SD=3.53, 2.80) and psychological symptoms (M=20.16, 20.46, SD= 2.32, 3.56 ) before administration of soya milk between control and experimental group of menopausal women is not statistically significant ( $p<0.05$ ). Whereas the difference in mean and standard deviation of physiological symptoms (M=18.7, 14.4, SD=3.54, 4.66) and psychological symptoms (M=20.16, 13.56, SD= 2.40, 4.81) after administration of soya milk between control and experimental group of menopausal women is statistically significant ( $p<0.001$ ).

There is significant reduction of physiological and psychological symptoms in experimental group after soya milk administration which can be attributed to the effectiveness of soya milk. Hence null hypothesis  $H_0$ , "There will be no significant difference in menopausal symptoms before and after administration of soya milk between control and experimental group of menopausal women" was rejected.

#### Conclusion

The findings of the study showed that the effectiveness of soya milk upon menopausal symptoms in experimental group was better than those in the control group. Hence it could be concluded that there is an association between the menopausal symptoms and

administration of soya milk. Soya milk is easy to administer and a natural supplement for menopausal women, which can also be prepared at home and consumed.

#### References

- Aaron, R.&Mulyil J. (2002). Medical social dimensions of menopause. National Medical Journal of India, 15(1), 14-17.
- Adele, P. (2007). Menopause. Maternal and child health nursing, (6<sup>th</sup>ed), Philadelphia, 102-104.
- Allender, A. (2010). Women's health. Community Health Nursing, (7<sup>th</sup>ed), Lippincot, 662-663.
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- Shah, R. et al (2004). Menopausal symptoms in urban Indian women, Obstetrics & Gynecology Today, 9(10), 667-670.

## ORIGINAL ARTICLE

### EFFECT OF TRATAK GUIDED MEDITATION TECHNIQUE UPON STRESS AND CONCENTRATION LEVEL AMONG LATE ADOLESCENT GIRLS.

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#### ABSTRACT

Growing through adolescence to young adulthood, life just gets more complicated as added demands create more responsibilities to manage, and more information and competencies to learn. Our mind cannot stay still for longer than a few moments, which eventually results in lack of concentration and loss of memory. He or she may have to undergo lot of stress and problems which affect the memory and concentration level of the adolescents to function well. Decreasing concentration levels and increasing stress levels at this budding age can have a great impact on their future. Adolescence is the period when the individual can be shaped and molded into great adult psychologically. Meditation gives joy and tratak guided meditation helps promote focus and concentration along with joy thus reducing the burden of stress. The present study employed Pre experimental research, one group pre and post test design. The study included 30 nursing students as the sample size. Non probability purposive sampling technique was adopted for this study. Apollo College of Nursing, Chennai was the selected setting. Tools used were Modified Dr. Latha Satish Stress Scale and Rating Scale for Assessing Concentration and Focus Skills. Data collection was done for a period of 4 weeks. It can be interpreted that TGMT administered for about 3 weeks showed markedly increased concentration levels and decreased stress levels. The idea is to let the flame of candle eliminate the darkness of ignorance which is rooted deep in the mind.

**Keywords:** Adolescence, Stress, Concentration, Tratak Guided Meditation Technique

#### INTRODUCTION

Our mind is always occupied with the incessant flow of thoughts. It is always in a state of disturbance, and has a habitual tendency for distraction. This leaves us feeling so much fragmented that we find ourselves scattered in all directions. It is no exaggeration then, to say that our mind cannot stay still for longer than a few moments, which eventually results in lack of concentration and loss of memory. Adolescence is the period when the individual can be shaped and molded into great adult

psychologically. The sense of identity and crisis of intimacy and isolation increases as adolescent progress towards young adulthood and move from dependency to the beginning of independence.<sup>1</sup> Metamorphically adolescents change their behavior patterns and values as well. The rates of change in attitude, interest are seen parallel to the rate of physical change in the growth and development of an adolescent, the emotional disturbance might lead them to react to frustration through maladjusted behavior displayed by children more in schools and colleges.<sup>2</sup>

Tratak not only brings an end to the mind's distractions but also enhances the ability to concentrate. It increases the power of memory and brings the mind in a state of awareness, attention and focus. Tratak is an ideal meditation technique for people of all age groups, especially for students who need to concentrate on studies, sports persons and older people who often tend to forget every now and then can greatly benefit from this technique.

As a result of its continuous practice, an immense rise in confidence level, stability in thoughts, and an ability to focus on whatever task undertaken will be witnessed.

**Need for the Study:** Adolescence is a critical stage in the life of a human. Hence he or she may have to undergo lot of stress and problems which affect the memory and concentration level of the adolescents to function well. Decreasing concentration levels and increasing stress levels at this budding age can have a great impact on their future. Guiding them and intervening at this point would be the best possible way to create peace thus helping them to perform better in their personal and professional career. Meditation gives joy and tratak guided meditation helps promote focus and concentration along with joy thus reducing the burden of stress.<sup>3,4</sup>

**Objectives of the study:** To assess the effect of Tratak Guided Meditation Technique upon the level of stress among late adolescent girls through pre and post assessment. 2. To assess the effect of Tratak Guided Meditation Technique upon concentration among late adolescent girls through pre and post assessment.

## METHODS AND MATERIALS

This study employed Pre experimental research, one group pre and post test design. The study included 30 nursing students as the sample size : 5 from B.Sc(N) I Year, 5 from B.Sc(N) II Year, 5 from B.Sc(N) III Year, 5 from B.Sc(N) IV Year and 5 each from Post Basic B.Sc(N) I & II Year. Non probability purposive

sampling technique was adopted for this study. Apollo College of nursing, Chennai was the selected setting.

**Tools:** Demographic Variables (age, sex, religion, family income, dietary habits, etc ). Modified Dr. Latha Satish Stress Scale is a standardized scale which was modified by the investigator after extensive review of literature and consultation with experts. Rating Scale for Assessing Concentration and Focus Skills : It consist of ten questions with maximum scores of 50. The rating scale indicates how often (or) to what degree the individual agrees with the statement. This rating scale was designed by the researcher to assess the ability to concentrate despite distraction, boredom or fatigue which requires a lot of self discipline.

The data collection was done for a period of 4 weeks. Formal permission was obtained to conduct the study in Apollo College of nursing, Chennai. The adolescent girls were selected on the basis of inclusion criteria. The purpose of the study was explained and written consent was received from the adolescent girls to ensure full cooperation., stress level also assessed by using stress scale. Investigator administered Tratak Guided Meditation Technique and the level of stress and concentration was assessed before and after the same.

**Description of the Intervention:** Tratak Guided Meditation Technique was performed every day morning for 3 weeks by placing a lighted candle in front of each participant, keeping the flame of the candle at the eye level and at 1 metre distance from the participant. Participants were asked to keep their spine erect and focus on the candle flame so that inner energy can flow easily through the subtle channels of the body and render tranquility to the restless mind.

### Stage 1

This powerful technique of meditation is based on fixing one's gaze at the flame of a candle or diya. The flame should burn steadily and it will do so only when we calm the air around it. Begin with slow and deep breathing. As you inhale, let the stomach expand, and

breathe out with complete contraction. While you breathe in this manner, keep a steady gaze at the flame.

Keep your eyes focused. Gaze at the flame, not the wick or the candle or the diya; just the flame. Let your vision be at the flame. If thoughts arise, simply ignore them; do not struggle to remove them. It is important to be wakeful and vigilant.

#### Stage2

Imagine the flame is entering your body through your eyes and illuminating your inner being. At this stage, it is good to let the eyes close with ease. Now, try to imagine the same flame with closed eyes as you were seeing it with open eyes. If you are able to practice Tratak without blinking your eye, it will be easy for you to see the flame with closed eyes. The total time taken is approximately 5- 10 minutes. Time taken varies from person to person. Participants are requested not to perform meditation when they have head ache or any other pain. At the end of 3<sup>rd</sup> week again the level of stress and concentration was assessed. The idea is to let the flame of candle eliminate the darkness of ignorance which is rooted deep in the mind.

Gradually you will find that your gaze has grown more peaceful and tranquil.

Once you are established within, watch yourself separate from this body, and be distant from your mind. This distance will eliminate the clutter from the mind and make it silent, peaceful, and tranquil.<sup>45</sup>

#### RESULTS

Table 1 reveals that most of the participants were in the age group of 18-19years (70%), belonging to Christian religion (53%), all were females (100%) and half of the study participants (50%) had family income of Rs. 8001 per month. All the participants (100%) were consuming non vegetarian food and majority of the study participants (90%) were consuming coffee/tea.

Table 2 show that the mean concentration level of late

adolescent girls were 10.7 before administration of tratak guided meditation technique and after administration of tratak the concentration level of late adolescent girls were increased to 12.9. The difference was statistically proven to be significant at  $p < 0.001$ .

Table 3 show that the mean stress level of late adolescent girls were 12.4 before administration of TGMT and after administration of TGMT the stress level of late adolescent girls were reduced to 9.5. The difference was statistically proven to be significant at  $p < 0.001$ .

#### DISCUSSION

As most of the participants were in the age group of 18-19 years, it can be interpreted that stress and lack of concentration were widely common in this age group due to their changes in physical and psychological growth. The investigator identified that consuming tea / coffee along with spicy diet may be a cause for developing fatigue and boredom.

The findings of the present study showed that the majority of late adolescent girls (87%) experienced moderate stress and few of them experienced mild stress(13%). The level of stress in late adolescents was high before TGMT ( $M=12.4$ ,  $SD=0.806$ ) and after the TGMT it was found to be less ( $M=9.5$ ,  $SD=0.695$ ). The difference was statistically proven to be significant at  $p < 0.001$ . It was found that the participants were relaxed to prepare for examinations and they may plan their schedules clearly by that they can do their assignments at time without delay. From these findings, it can be assumed that administration of TGMT reduces the stress among late adolescents.

The mean concentration level of late adolescent girls before administration of TGMT was ( $M = 10.7$ ,  $S.D = 0.635$ ) and after the TGMT the mean concentration level of late adolescent girls was high (Mean =12.9, S.D =1.01). The difference was statistically proven to be significant at  $p < 0.001$  level. It can be interpreted that



TGMT administered for about 3 weeks showed markedly increased concentration levels.

It was found that participants who received TGMT had decreased hair loss, fatigue. It was found that reduction in mental irritability and tachycardia was also there. It can be interpreted that TGMT is found to be very effective in enhancing the concentration power and had a great impact on their focus skills.

### CONCLUSION

It is only when we learn to meditate that we learn to live life meaningfully. Meditation is an experience in itself which enhances the quality of life and helps one discover the exuberant inner bliss. With mounting pressures and endless pursuit to achieve lofty ambitions, we go on running tirelessly. Amidst all this

chaos, take a deep breath and explore the benefits of Tratak Guided Meditation, an ideal meditation technique for people of all age groups. Tratak has physiological, psychological and spiritual benefits on the individual who follows it. It is highly recommended for students and working professionals for greater efficiency. The above finding reveals that administration of Tratak guided meditation technique is effective for reducing stress and improving concentration and focus skills among adolescent girls.

### Acknowledgement

None

### Source of Support

Nil

### Conflict of Interest

None

Table.1 Frequency and Percentage Distribution of Demographic Variables of late adolescent girls.

N = 30		
Demographic variables	n	p
<b>Age</b>		
17-18yrs	9	30
18-19yrs	21	70
<b>Sex</b>		
Male	-	-
Female	30	100
<b>Religion</b>		
Hindu	14	47
Christian	16	53
<b>Family income</b>		
< 3000	4	13
3001-5000	4	13

5000-8000	7	24
>8001	15	50
<b>Dietary habits</b>		
Vegetarian	–	–
Non- vegetarian	30	100
<b>Consumption of coffee/tea</b>		
Yes	27	90
No	3	10

**Table. 2 Mean and standard deviation of concentration level in late adolescent girls before and after Tratak Guided Meditation Technique**

N=30

Group	Mean	Standard deviation	t
Concentration level before Tratak Guided Meditation Technique	10.7	0.635	14.89***
Concentration level after Tratak Guided Meditation Technique	12.9	1.01	

**Table. 3 Mean and standard deviation of stress level in late adolescent girls before and after Tratak guided meditation technique**

N=30

Group	Mean	Standard deviation	t
Stress level before Tratak Guided Meditation Technique	12.4	0.806	20.74***
Stress Level After Tratak Guided Meditation Technique (TGMT)	9.5	0.695	

## REFERENCES

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## ANNEXURE W

### PH.D SYNOPSIS SUBMISSION APPLICATION FORM

66 /

Serial No.

APPLICATION FEE : Rs.

The Tamil Nadu Dr. M.G.R. Medical University, Chennai.

#### FORM - IV

#### Ph.D., Synopsis Submission Application Form:-

Note : Candidates should submit the duly filled Synopsis Application Form and Six copies of the Synopsis on or before the last working day of the Registration Sessions as given in No.31 of the Ph.D., Regulations.

- 1) Details of Remittance : DETAILS ENCLOSED
  - a) Name of the Bank / Branch.
  - b) Amount Remitted.
  - c) Demand Draft / Cheque No.
  - d) Date of issue / remittance.
- 2) Name of the Candidate : MRS. SHOBANA G.
- 3) Date of Birth & Age : 17/05/1972 & 44 Yrs
- 4) Place of Birth : ERODE
- 5) Name and Occupation of father / guardian : MR. A.K. ASOKAN, IT TRAINER
- 6) Nationality : INDIAN
- 7) Religion : HINDU
- 8) Designation of the Candidate : PROFESSOR
- 9) Office Address with Tel. No./Fax No./E-mail I.D. : APOLLO COLLEGE OF NURSING  
VARAANAM 40 AMBATTUR  
200004
- 10) Address for Communication with Telephone No. / Fax No. / E-mail I.D. : AYANAMISAKKAM  
CHENNAI - 600041 26534387  
2006.shobana@gmail.com
- 11) Name of the University, Register Number, Month and Year of Passing of the qualifying examination as mentioned in No.3 of Ph.D., Regulations. : THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY  
APRIL 2001 - M.Sc. NURSING  
01/01/2014 - METHUEN DAY PH.D EXAMINATION

- 12) Date, Month & Year of the Convocation at which the qualifying Degree was taken
- 13) The Examination passed is from any other University, state the number and date of the communication recognising the Degree (Enclose certified Xerox Copies).
- 14) The month and year in which the candidate was provisionally registered (Enclose certified Xerox Copies of confirmation of Provisional Registration).
- 15) Name of the Guide
- 16) Name of the Department / Institution where the Research Work was done Mention may be made about the additional places of the Research Work if any.
- 17) Title of the Thesis in Block Letters
- 18) Signature of the Candidate
- 19) Signature of the Guide with Designation
- 20) Signature of the Head of the Department where the candidate conducted the Research Work.
- 21) Signature of the Head of the Institution where the candidate is working
- 22) Station with Date

MARCH 2002

THE TAMIL NADU DR.M.G.R  
MEDICAL UNIVERSITY, CHENNAI

01/01/2013

DR. LATHA VENKATESAN  
APOLLO COLLEGE OF NURSING  
CHENNAIEFFECTIVENESS OF YOGA UPON  
MENOPAUSAL SYMPTOMS IN MENOPAUSAL  
WOMEN AT SELECTED PRIMARY  
HEALTH CENTRES, THIRUVALLUR

Latha

Latha

Latha

PRINCIPAL  
APOLLO COLLEGE OF NURSING  
Vanagaram To Ambattur Main  
Ayanambakkam, Chennai-600 0

CHENNAI 30/09/2016

## ANNEXURE – X

### PH.D THESIS SUBMISSION APPLICATION FORM

Serial No.

APPLICATION FEE : Rs.





The Tamil Nadu Dr. M.G.R. Medical University, Chennai.

#### FORM – V

#### Ph.D., Thesis Submission Application Form :-

S.No	Contents	:	Details
1)	Details of Remittance		
	a) Name of the Bank / Branch	:	Indian Overseas Bank, Apollo Hospitals Branch
	b) Amount Remitted	:	Rs.30,500/-
	c) NEFT transfer UTR No	:	IOBAN16357483988
	d) Date of Issue / Remittance	:	22/12/2016 <b><u>Enclosure 1: e - Receipt of fees remitted</u></b>
2)	Name of the Candidate	:	Mrs. Shobana Gangadharan
3)	Date of Birth & Age	:	17/05/1972 . 44 Yrs
4)	Place of Birth	:	Erode
5)	Name and Occupation of Guardian	:	Mr. Asokan. A.K . I.T Consultant.
6)	Nationality	:	Indian
7)	Religion	:	Hindu
8)	Designation of the Candidate	:	Professor & Head of the Department in Community health Nursing
9)	Office Address	:	Apollo College of Nursing, A Unit of Apollo Hospitals Educational Trust, Vangaram to Ambattur Road, Ayanambakkam, Chennai -600095
	Telephone Number	:	044 -26534387
	Fax No.	:	044 – 26534923/4386
	E.mail I.D	:	apollocollegeofnursing@gmail.com

10)	Address for Communication  Mobile Number Email Address	:	154/2, Natesan Nagar, 3 <sup>rd</sup> Main Road, Virugambakkam, Chennai – 600092  9840491279 2006.shobana@gmail.com
11)	Name of the University  Register Number, Month and year of Passing the qualifying examination as mentioned in No. 3 of Ph.D Regulations.	:	The Tamilnadu Dr. M.G.R Medical University. Reg No :30991608 Month & Year of passing M.Sc.Nursing – March 2001  <b><u>Enclosure 2 : Certified Xerox copy M.Sc.Nursing Mark sheet</u></b>
12)	Date, Month & Year of the Convocation at which the qualifying Degree was taken	:	Date of obtaining M.Sc. Nursing 03/05/2002.  <b><u>Enclosure 3 : Certified Xerox copy of M.Sc Nursing Degree Certificate</u></b>
13)	The Examination passed is from any other University, state the number and date of the communication recognising the Degree (Enclose certified Xerox Copies).	:	Not Applicable
14)	The month and year in which the candidate was provisionally registered for Ph.D (Enclose certified Xerox Copies of confirmation of Provisional Registration).	:	Date of Provisional Registration for Ph.D - 01/01/2013  <b><u>Enclosure 4 : Certified Xerox copy of Provisional Registration Certificate for Ph.D</u></b>
15)	Name of the Guide	:	Dr.Latha Venkatesan
16)	Whether the candidate has published at least two research papers in the indexed journals / National /International Conferences	:	Yes  <b><u>Enclosure 5 : Certified Xerox copies of publications in Journals</u></b>
17)	Name of the Faculty / Branch Name of the Department / Institution where the Research Work was done.	:	Nursing / Community Health Nursing Obstetrics and Gynecology Nursing Apollo College of Nursing, Chennai  <b><u>Enclosure 4 : Certified Xerox copy of</u></b>

	Mention may be made about the additional places of the Research Work if any.	<p><b><u>Provisional Registration Certificate for Ph.D</u></b></p> <p>Primary Health Centres Thiruverkadu and Naravarikuppam</p> <p><b><u>Enclosure 6 : Certified Xerox copy of permission letters from DPH, Chennai and DDHS Thiruvallur District</u></b></p>
18)	Title of the Thesis in Block Letters	"EFFECTIVENESS OF YOGA UPON MENOPAUSAL SYMPTOMS IN MENOPAUSAL WOMEN AT SELECTED PRIMARY HEALTH CENTRES OF THIRUVALLUR DISTRICT, CHENNAI"
19)	Whether the anti-plagiarism software been utilized before submission of thesis to this University	The Anti - Plagiarism Software from the University is not working
20)	Whether the applicant submitted the Thesis previously for the Degree; if so, the month/s and year/s in which the Thesis was submitted	Not submitted earlier
21)	If the Thesis is re-submitted, please mention the reasons for re-submission	Not applicable
	a) Corrections carried out and re-submitted. b) Rejected in the first instance and re-submitted with additional work.	Not applicable
22)	Signature of the Candidate	 SHOBANA G.
23)	Signature of the Guide with Designation	
24)	Signature of the Head of the Department where the candidate conducted the Research Work.	 VANDANATHAN APPOINTMENT OFFICER VANDANATHAN APPOINTMENT OFFICER VANDANATHAN APPOINTMENT OFFICER
25)	Signature of the Head of the Institution where the candidate is working	 VANDANATHAN APPOINTMENT OFFICER VANDANATHAN APPOINTMENT OFFICER
26)	Station with Date	CHENNAI 26/12/2016



ANNEXURE -Y

PHOTOS







Group	SINo	MRS with domains-pre				MRS with domains -Post				MENQOL total		MENQOL with domains-pre			MENQOL with domains-				
		SomVeg	Psych	Urogen	Pre tot	SomVeg	Psych	Urogen	Post tot	PRE-	POST	VM-Phy	Psycoc	Sexl	total	VM-Phy	Psycoc	Sexl	total
1	1	8	13	4	25	2	2	3	7	135	39	88	40	7	135	18	14	7	39
1	2	9	11	7	27	3	4	3	11	136	48	92	34	10	136	18	22	8	48
1	3	11	11	9	31	3	4	2	9	161	42	99	49	13	161	18	14	10	42
1	4	10	10	7	27	5	5	3	13	161	78	102	48	11	161	36	34	8	78
1	5	9	10	9	28	4	4	3	11	155	69	96	46	13	155	32	26	11	69
1	6	11	10	6	27	5	4	3	12	159	62	99	51	9	159	29	27	6	62
1	7	4	8	7	19	0	2	3	5	149	52	90	49	10	149	24	20	8	52
1	8	8	9	5	22	2	4	3	9	135	52	86	41	8	135	26	18	8	52
1	9	12	13	10	35	6	4	4	14	147	52	101	37	9	147	24	20	8	52
1	10	10	10	7	27	4	3	3	10	150	49	98	42	10	150	19	21	9	49
1	11	9	12	2	23	4	3	0	7	135	53	91	38	6	135	30	18	5	53
1	12	6	5	1	12	3	2	0	5	141	60	96	41	4	141	36	20	4	60
1	13	4	8	4	16	0	4	1	5	154	48	91	53	10	154	18	22	8	48
1	14	12	13	8	34	6	6	3	15	141	52	97	33	11	141	24	18	10	52
1	15	11	16	7	34	4	4	5	13	155	46	89	53	13	155	21	13	12	46
1	16	8	11	3	22	5	4	1	10	107	35	70	31	6	107	18	11	6	35
1	17	10	11	9	30	4	2	3	9	167	83	108	48	11	167	45	28	10	83
1	18	9	10	3	22	3	4	1	8	145	38	105	35	5	145	20	14	4	38
1	19	10	9	6	25	4	3	3	10	158	52	108	39	11	158	28	14	10	52
1	20	12	11	4	27	4	3	3	10	154	51	104	44	6	154	24	22	5	51
1	21	6	10	6	22	2	4	3	9	144	48	96	42	6	144	22	21	5	48
1	22	13	11	8	32	6	4	5	15	170	82	112	48	10	170	44	30	8	82
1	23	10	12	3	25	4	5	1	11	152	59	110	35	7	152	33	20	6	59
1	24	9	9	7	25	5	3	3	11	151	53	106	36	9	151	26	19	8	53
1	25	9	11	7	27	5	7	4	16	142	74	97	39	6	142	46	22	6	74
1	26	10	8	5	23	7	4	3	14	152	78	108	36	8	152	48	22	8	78
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1	28	13	9	6	28	6	3	2	11	155	76	110	39	6	155	42	28	6	76
1	29	11	10	6	27	5	3	4	13	165	102	118	37	10	165	68	24	10	102
1	30	7	13	8	28	3	6	3	12	171	96	109	50	12	171	50	36	10	96
1	31	8	6	3	17	4	2	2	8	128	44	82	36	10	128	23	11	10	44
1	32	10	8	5	23	4	4	3	11	152	51	104	41	10	152	27	14	10	51
1	33	10	12	6	28	6	6	4	16	126	48	83	36	7	126	26	14	8	48
1	34	11	8	6	25	5	3	3	11	153	67	110	34	9	153	38	20	9	67
1	35	5	10	3	18	2	5	2	9	116	48	75	33	8	116	23	18	7	48
1	36	7	13	3	23	4	4	1	9	126	50	88	31	7	126	26	17	7	50
1	37	8	10	6	24	3	4	3	10	156	48	119	31	6	156	32	10	6	48

1	38	9	11	2	22	5	5	0	10	140	52	92	42	6	140	34	12	6	52
1	39	10	10	6	26	3	4	4	11	143	61	104	32	7	143	40	15	6	61
1	40	7	8	5	20	3	5	2	10	152	37	106	38	8	152	18	12	7	37
1	41	11	11	8	30	6	5	3	14	164	59	112	42	10	164	32	18	9	59
1	42	10	11	5	26	5	5	3	13	136	58	90	37	9	136	32	18	8	58
1	43	10	9	4	23	4	3	3	10	152	48	113	35	4	152	30	14	4	48
1	44	6	9	7	22	3	3	4	10	137	45	89	42	6	137	28	11	6	45
1	45	11	12	10	33	6	6	4	16	154	52	108	37	9	154	32	12	8	52
1	46	11	11	7	29	6	5	5	16	147	49	103	34	10	147	29	10	10	49
1	47	8	10	9	27	3	5	3	11	161	73	111	43	7	161	40	27	6	73
1	48	10	10	3	23	4	5	1	10	146	52	98	38	10	146	30	12	10	52
1	49	7	10	7	24	3	4	3	10	150	64	102	38	10	150	34	22	8	64
1	50	10	11	3	24	5	5	1	11	150	73	100	43	7	150	44	22	7	73
1	51	9	12	7	28	2	2	3	7	155	80	104	43	8	155	48	25	7	80
1	52	9	11	5	25	3	3	2	8	156	55	112	35	9	156	26	20	9	55
1	53	12	13	7	32	4	5	2	11	167	58	119	41	7	167	32	18	8	58
1	54	12	8	6	26	4	3	4	11	157	53	120	29	8	157	23	23	7	53
1	55	13	9	6	28	6	3	2	11	155	76	114	34	7	155	44	25	7	76
1	56	11	10	6	27	5	3	4	13	165	102	125	31	9	165	69	25	8	102
1	57	7	13	8	28	3	6	3	12	171	96	132	34	7	171	59	30	7	96
1	58	8	6	3	17	4	2	2	8	128	44	87	34	7	128	22	16	6	44
1	59	10	8	5	23	4	4	3	11	152	51	112	30	10	152	28	13	10	51
1	60	10	12	6	28	6	6	4	16	126	48	78	38	10	126	23	14	11	48
1	61	11	8	6	25	5	3	3	11	153	67	116	30	7	153	42	18	7	67
1	62	5	10	3	18	2	5	2	9	116	48	75	35	6	116	28	14	6	48
1	63	8	13	4	25	4	4	1	9	126	50	73	44	9	126	30	12	8	50
1	64	8	10	6	24	3	4	3	10	156	48	102	48	6	156	32	10	6	48
1	65	9	11	4	24	5	5	0	10	140	52	94	36	10	140	28	14	10	52
1	66	10	10	8	28	3	4	4	11	143	61	98	36	9	143	35	18	8	61
1	67	7	8	5	20	3	5	2	10	152	37	114	32	6	152	18	13	6	37
1	68	9	11	7	27	3	4	3	11	136	48	91	36	9	136	26	14	8	48
1	69	11	11	9	31	3	4	2	9	161	42	124	30	7	161	20	16	6	42
1	70	10	10	7	27	5	5	3	13	161	78	116	36	9	161	44	24	10	78
1	71	9	10	9	28	4	4	3	11	155	69	107	41	7	155	40	22	7	69
1	72	11	10	6	27	4	4	3	12	159	62	110	39	10	159	35	17	10	62
1	73	4	8	7	19	0	2	3	5	149	52	104	34	11	149	28	14	10	52
1	74	8	9	5	22	2	4	3	9	135	52	92	36	7	135	26	20	6	52
1	75	12	13	10	35	6	4	4	14	147	52	108	32	7	147	30	15	7	52
1	76	10	10	7	27	4	3	3	10	150	49	106	35	9	150	27	14	8	49

1	77	9	12	2	23	4	3	0	7	135	53	91	36	8	135	32	13	8	53
1	78	12	8	6	26	4	3	4	11	147	50	109	32	6	147	27	18	5	50
1	79	13	9	6	28	6	3	2	11	158	76	122	28	8	158	50	18	8	76
1	80	11	10	6	27	5	3	4	13	188	102	132	47	9	188	68	27	7	102
1	81	7	13	8	28	3	6	3	12	171	96	118	45	8	171	64	26	6	96
1	82	8	6	3	17	4	2	2	8	128	44	88	34	6	128	21	18	5	44
1	83	10	8	5	23	4	4	3	11	152	51	124	32	8	152	30	13	8	51
1	84	10	12	6	28	6	6	4	16	126	48	78	40	8	126	28	12	8	48
1	85	11	8	6	25	5	3	3	11	153	67	111	32	10	153	40	18	9	67
1	86	5	10	3	18	2	5	2	9	116	48	78	32	6	116	24	18	6	48
1	87	8	13	4	25	4	4	1	9	126	50	81	38	7	126	30	13	7	50
1	88	8	12	6	26	2	3	2	8	164	73	114	42	8	164	45	20	8	73
1	89	9	11	4	24	5	5	0	10	140	52	100	33	7	140	27	18	7	52
1	90	10	10	8	28	3	4	4	11	143	61	106	27	10	143	34	17	10	61
1	91	7	10	5	22	3	5	2	10	140	37	88	45	7	140	18	12	7	37
1	92	9	11	7	27	3	4	3	11	128	36	80	39	9	128	18	11	7	36
1	93	11	11	9	31	3	4	2	9	161	42	121	31	9	161	22	12	8	42
1	94	10	10	7	27	5	5	3	13	161	74	118	35	8	161	45	22	7	74
1	95	9	10	9	28	4	4	3	11	155	69	114	32	9	155	42	19	8	69
1	96	11	10	6	27	5	4	3	12	159	58	122	29	8	159	36	16	6	58
1	97	4	8	7	19	0	2	3	5	149	52	103	38	8	149	32	14	6	52
1	98	8	11	5	24	2	4	3	9	135	52	95	32	8	135	30	16	6	52
1	99	12	14	10	36	6	6	4	16	127	46	81	37	9	127	26	13	7	46
1	100	10	13	7	27	4	3	3	10	150	49	100	42	8	150	28	15	6	49
1	101	9	13	2	23	4	3	0	7	135	44	97	35	3	135	28	14	2	44
1	102	6	13	1	12	3	2	0	5	141	60	93	46	2	141	38	20	2	60
1	103	4	13	4	16	0	4	1	5	154	48	97	51	6	154	28	15	5	48
1	104	12	13	8	34	6	6	3	15	141	52	101	33	7	141	29	16	7	52
1	105	11	13	7	34	4	4	5	13	155	46	105	41	9	155	26	13	7	46
1	106	8	13	3	21	5	4	1	10	107	35	70	31	6	107	18	11	6	35
1	107	10	8	5	23	4	4	3	11	152	51	123	22	7	152	31	13	7	51
1	108	10	12	6	28	6	6	4	16	126	48	88	30	8	126	27	16	5	48

Group	SI No	MRS with domains-pre				MRS with domains -Post				MENQOL total		MENQOL with domains-pre			MENQOL with domains				
		SomVeg	Psych	Urogen	Pre tot	SomVeg	Psych	Urogen	Post tot	PRE-	POST	VM-Phy	Psysoc	Sexl	total	VM-Phy	Psysoc	Sexl	total
2	1	9	12	7	28	9	11	7	27	155	148	123	22	10	155	120	20	8	148
2	2	9	11	5	25	10	10	6	26	156	148	120	28	8	156	116	25	7	148
2	3	12	13	7	32	12	12	6	26	167	175	125	33	10	167	129	35	11	175
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2	120	8	8	7	23	9	9	7	25	149	145	114	25	10	149	110	25	10	145

Menopausal Symptoms assessed by MRS - Domain 1 - Somatic - 4 items (1,2,3,11)

Domain 2 - Psychological - 4 items - (4,5,6,7)

Domain 3 - Urogenital - 3 items- 8,9,10)

The Menopause Specific Quality of Life -

Domain 1 - vasomotor & Physical joined together - ie., vasomotor 3 items (1-3)  
physical -15 items (11-25)  
total -18 items

Domain 2 - Psychosocial -7 items (4 -10) and

Domain 3 - Sexual - 2 items ( 26 -27)







