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A comparitive study to evaluate the efficacy of selected Yoga techniques in Perimenopausal Women

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ABSTRACT

Background: Menarche and menopause are the two major components of women's reproductive life. Perimenopause is a transition stage from reproductive phase to non reproductive phase, which begins several years before the actual menopause. It demands priority in the Indian scenario due to increase in life expectancy and growing population of menopausal women. During this phase there is imbalance in the hormonal levels which causes both physical and emotional symptoms. Yoga, a potential alternative to hormone therapy, is currently being assessed for its therapeutic value in decreasing stress and other symptoms associated with Perimenopause. Hence this study was undertaken to see the effect of selected yoga techniques in reducing the physical and psychological symptoms in Perimenopause women. **Materials & Methods:** It was an Open Randomized Comparitive Clinical Trial of 2 groups was adopted with pre-test and post-test design. 25 subjects in each group were selected using the inclusion and diagnostic criteria with selected *Yogasanas* and *Pranayama* and selected *Pranayama* respectively. The subjects were taught with selected Yoga techniques for a week and given printed protocol. They were asked to continue the therapy for 60 days. The criteria assessed were irregular menstruation, hot flushes, night sweats, palpitation, fatigue, weakness, depression, insomnia, irritability, mood swing and anxiety on 0^{th}, 30^{th}, 60^{th} and 90^{th} day. **Results**: Selected Yogasanas and Pranayama has given statistically significant results in reducing all the physiological and psychological symptoms in Perimenopausal women whereas Selected Pranayama showed statistical significance in symptoms like Hot Flushes, Night Sweats, Palpitation, Fatigue, weakness, Insomnia and Irritability and showed no statistical significance in Irregular Menstruation, Depression and Anxiety. **Conclusion:** The symptoms were reduced statistically in Selected Yogasanas and Pranayama when compared to Selected Pranayama Group. Thus, Perimenopause condition will be effectively managed with Selected Yogasanas and Pranayama.

Key words: *Perimenopause, Menopause, Pranayama, Yogasanas.*

INTRODUCTION

Women play variety of significant roles in our society and community as well as in a family from their birth till the end of life. Menarche and menopause are the two major components of women's reproductive life, since the interval between them determines the natural reproductive phase, which has an important influence on the women's physical, physiological, social, spiritual and emotional wellbeing and overall quality of life. In 1990, there were an estimated 467 million women in Karnataka and this number is expected to increase to 1200 million by the year 2030.[1] It demands priority in the Indian scenario due to increase in life expectancy and growing population of menopausal women.[2] According to the Indian Menopausal Society, there will be large increase in the Perimenopausal women in India.[3] During this stage there is decline in ovarian hormone and aging producing menopausal symptoms. Menopause begins at the age around fifty years. But before reaching this stage, women will have to face the stage of

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Perimenopause. It is a transition stage from reproductive phase to non reproductive phase, which begins several years before the actual menopause. It's the time when the ovaries gradually begin to produce less estrogen. Estrogen is the major hormone which is involved in increasing the crucial part of the parasympathetic nervous system. And the fluctuation at the level of estrogen leads to the imbalance of sympathetic and parasympathetic balance. Reduction in the estrogen level leads to under reactive parasympathetic action and over reactive sympathetic action, and also produces many symptoms both physically and psychologically. Prevalence of somatic symptoms like Hot flushes, night sweat etc and psychological symptoms like mood swing, depression etc. is seen in 80% and incidence of 10.15% in women at Perimenopausal period.[4]

Most of Indian women over the age of 40, do not understand the changes taking place in body during perimenopause. These symptoms are severe enough to affect woman's ability to function at home/in her relationship with others.[5] To improve the immediate symptoms of menopause and to manage its long-term consequences, hormonal therapies have been used extensively. However, these therapies have created new concerns about the increased risk of neoplasia of the endometrium and possibly the breast.[6-8] Hence it becomes important to develop holistic methods in safe management of Perimenopausal symptoms of this group of woman. Both physical and psychological symptoms are included in Perimenopause. Therefore is a need of strong intervention to tackle these symptoms.

Yoga, the traditional Indian- body mind science has been used effectively in various health disorders, which can be done at any age. It is most beneficial to those over 40 years, when the re-curative power of the body is declining and resistance to illness is weakened. Yogasanas and Pranayamas are today recognized as techniques that can improve muscle strength, flexibility, blood circulation and oxygen uptake as well as hormone functions[9] at the gross level. Since yoga is a holistic, non-pharmacological, cost-effective method,[10] it may be particularly important to mid-life as a safe option. Although the validity of claims about yoga and health has been questioned (Foreman, 2004) the number of studies focusing on the psychological, musculoskeletal, cardiovascular, and autonomic nervous system effects of yoga continues to grow. Comprehensive reviews have examined indices of cardiovascular disease risk and improved musculoskeletal function.[11]

A recent review comparing the benefits of yoga versus traditional exercise for a variety of health outcomes including blood lipids, blood glucose, heart rate variability and perceptions of stress, found that yoga is as effective, or better, than traditional exercise for improving many health-related outcomes.[12] On the other hand, another review focusing specifically on efficacy of yoga in menopausal symptom reduction concluded that there was insufficient evidence to recommend Yoga as an intervention.[13] With regard to the benefits of Yoga to menopausal women, studies that clearly demonstrate a relationship between Yoga practice and hormonal changes are scarce. Hence, this is an effort to study the efficacy of selected Yoga techniques in reducing the physical and psychological symptoms in Perimenopause women.

AIMS AND OBJECTIVES

- Reducing the physical and psychological symptoms in Perimenopausal women
- To study the efficacy of Selected *Pranayama* in Perimenopausal women.
- To evaluate the efficacy of Selected *Yogasanas* and *Pranayama* techniques in Perimenopausal Woman.

MATERIALS AND METHODS

Selection of Patient's

50 subjects diagnosed with perimenopause were selected by screening subjects with specially prepared screening case proforma meant for the study from OPD and IPD of JSSAMCH, Mysuru and also special camps which was conducted in this regard.

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Method of data collection

50 subjects of Perimenopause cases were selected based on diagnostic, inclusion and exclusion criteria. Selected Yoga techniques were taught to the subjects. Initial 7 days training class was given to both the groups for correct performance of Yoga and Pranayama. Also the participants were provided with printed matter on protocol in local language. The participants were contacted on phone to assure the compliance and also to see any complications happened during the Yoga practice. However, no complications were seen during the study period.

Design of clinical study

Open Randomized Comparitive Clinical Trial Design was adopted in this study with pre-test and post-test design in two groups, each group comprising of 25 subjects having the symptoms of Perimenopause.

Group A - 27 subjects of Perimenopausal women were selected and taught *Nadi Shuddhi Pranayama*, *Sheetali*, *Sitkari* and *Bhramari Pranayama* - 5 rounds, *Savasana* - 10 min

Group B - 28 subjects of Perimenopausal women were selected and taught *Yogasana* consisting of *Parvatasana, Vrikshasana, Baddha Konasana, Ardha Matsyendrasana, Urdhwamukha Svanasana*, *Adhomukha Svanasana* and *Pavanamuktasana* - 20 min along with 5 rounds of *Nadi Shuddhi, Sheetali, Sitkari* and *Bhramari Pranayama, Savasana* - 10 min.

55 subjects were registered in the present clinical study. Out of them 50 subjects completed the study and 5 subjects were discontinued from the study for various reasons.

Diagnostic Criteria

- Irregular menstruation.
- Physiological symptoms like hot flushes, night sweats, palpitation, fatigue, weakness in relation with Perimenopausal period.
- Psychological symptoms like depression, insomnia, irritability, mood swing and anxiety in relation with Perimenopausal period.

Inclusion criteria

- Subjects fulfilling diagnostic criteria.
- Females with age group of 40-55 years.
- Not undergone estrogen replacement therapy for treating Perimenopausal symptoms within last 6 months.
- Subjects taking medication for hypertension, diabetes mellitus and is under control.
- Subjects willing to participate in the study.

Exclusion criteria

- Woman with surgical menopause.
- Subjects who attained menopause i.e., cessation of menstruation for 1 year. (above 55 years).
- Subjects suffering from any other systemic disorders which interfere with the course of disease and treatment
- Subjects who are not willing to participate in the study

Study duration

Total 90 days including 60 days intervention and follow up for 30 days.

Ethical clearance was obtained from the institutional review board (02SW/2015, dated March 24, 2016.) and the informed consent was obtained from the subjects before starting the intervention.

Assessment Tools

- Symptoms and grading for assessment
- Case record form

Table 1: Symptoms Grading For Assessment

Irregular Menstruation	
Grade 0	Nil (28 days)
Grade 1	Mild (28-45 days)
Grade 2	Moderate (45-60 days)
Grade 3	Severe (above 60 days)

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Physiological changes	
Hot Flushes	
Grade 0	No hot flushes
Grade 1	Occasional hot flushes
Grade 2	Daily 1-2 times and increased at the time of stress but do not disturb the routine work
Grade 3	Daily more than 5-6 times even without any stress and feeling disturbance in routine work
Grade 4	Appearance of hot flushes every 1-3 hourly, feeling marked discomfort
Night Sweats	
Grade 0	No sweating
Grade 1	Occurs only at working in hot or dong hard work
Grade 2	More in day time and when associated or following hot flushes only
Grade 3	Occurs even in night, following hot flush and disturbs the sleep at night
Grade 4	Excessive sweating to the extent that patient feels like taking bath or changing clothes, moderate episodes at night
Palpitation	
Grade 0	No palpitation
Grade 1	On climbing staircase
Grade 2	On walking small distance or excitement
Grade 3	Even on talking a little loudly or on hearing loud voice
Grade 4	Feeling of palpitation on any apparent cause, like fearing, exciting, irritating thought
Fatigue	
Grade 0	No fatigue
Grade 1	increased fatigue over baseline, but not altering normal activities
Grade 2	Moderate / difficulty in performing some activities.
Grade 3	severe, loss of ability to perform activity
Weakness	
Grade 0	no weakness
Grade 1	Slight weakness but work can be completed
Grade 2	weakness due to which work is interrupted
Grade 3	Weakness affecting routine work
Psychological symptoms	
Depression	
Grade 0	No depression
Grade 1	Occasional depression
Grade 2	Mild presence of depressed mood everyday but able to carry out routine work
Grade 3	Marked depression whole day, lost interest in everything especially in carrying out routine work even personal activities
Grade 4	With thoughts of death , suicidal ideation
Insomnia	
Grade 0	Normal satisfactory sleep
Grade 1	Occasional delayed sleep without waking episodes
Grade 2	Frequent delayed sleep with 1-2 waking episodes
Grade 3	Daily delayed sleep with frequent waking episodes followed by delayed reappearance of sleep
Grade 4	No sleep whole night fatigue in the morning due to it
Irritability	
Grade 0	No Irritability

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Grade 1	Can control and recognize irritable situation
Grade 2	Uncontrollable irritation with specific cause
Grade 3	Uncontrollable irritation without specific cause
Grade 4	Behaves unsociably, throws things etc
Mood Swing	
Grade 0	Present
Grade 1	Absent
Anxiety	
Grade 0	Not at all
Grade 1	A little
Grade 2	Quite a bit
Grade 3	Extremely

Assessments

1. Assessment before treatment (0^{th} day)

   Case record form

   Symptoms grading

2. Assessment during treatment (30^{th} day)

   Symptoms grading

3. Assessment after treatment (60^{th} day)

   Symptoms grading

4. Assessment after follow up (90^{th} day)

   Symptoms grading

Statistical Analysis

Data was entered in MS excel sheet and analyzed using SPSS trial version. Univariate analysis of the study variable was done and interpreted using mean, median and range. Bivariate analysis was carried about between the study variables. Difference in both the groups between various days of study was tested using Friedman test and Wilicoxon Signed Rank test. Difference among both the groups on each day was tested using Mann-Whitney U test. All the tests of significance were interpreted at 5% alpha error.

RESULTS

Effect of Selected Pranayama on Irregular Menstruation in Group A: Statistical analysis showed that before the treatment the mean rank of Irregular Menstruation was found to be 2.90 and after treatment it was reduced to 2.50, after follow up the mean rank was 1.86 on 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.003. Using Wilcoxon signed rank test after treatment the symptom reduction is only 5% which is not statistically significant at P Value 0.157 and after follow up the improvement is 30.95% is highly significant at P Value 0.000

Effect of Selected Yogasanas & Pranayama on Irregular Menstruation in Group B: Statistical analysis showed that before the treatment the mean rank of Irregular Menstruation was found to be 3.28 and after treatment it was reduced to 2.18, after follow up the mean rank was 1.50 on 90^{th} day. Using Friedman's test it was found to be statistically significant at P Value 0.001.Using Wilcoxon signed rank test after treatment the symptom reduction was 28.57% which is statistically significant at P Value 0.001 and after follow up the improvement is 56.52% is highly significant at P Value 0.000.

Effect of Selected Pranayama on Hot Flushes in Group A: Statistical analysis showed that before the treatment the mean rank of Hot Flushes was found to be 3.40, during treatment it was reduced to 2.20 and after follow up the mean rank was 1.56 on 90^{th} day. Using Friedman's test it was found to be statistically significant at 0.002. Using Wilcoxon signed rank test after treatment the symptom reduction was 8.6% during the treatment which is not statistically significant at P Value 0.25 and after treatment and follow up the improvement is 43.96%, which is highly significant at P Value at 0.00.

Effect of Selected Yogasanas & Pranayama on Hot Flushes in Group B: Statistical analysis showed that before the treatment the mean rank of Hot Flushes was found to be 3.86 and after treatment it was reduced to 1.74, after follow up the mean rank was 1.48 on 90^{th} day. Using Friedman's test it was found to

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be highly significant at P Value 0.000. Using Wilcoxon signed rank test after treatment the symptom reduction was 71.42% which is highly significant at P value 0.000 and after follow up the improvement is 90.65%, which is also highly significant P Value 0.000.

Effect of Selected Pranayama on Night Sweats in Group A: Statistical analysis showed that before the treatment the mean rank of Night Sweats was found to be 3.48 and after treatment it was reduced to 2.12, after follow up the mean rank was 1.80 on 90th day. Using Friedman's test it was found to be statistically significant at P value 0.004. Using Wilcoxon signed rank test after treatment the symptom reduction was 25.7% which is statistically significant at P Value 0.003 and after follow up the improvement is 48.83% which is highly significant at P value 0.000.

Effect of Selected Yogasanas & Pranayama on Night Sweats in Group B: Statistical analysis showed that before the treatment the mean rank of Hot Flushes was found to be 3.76 and after treatment it was reduced to 1.90, after follow up the mean rank was 1.54 on 90th day. Using Friedman's test it was found to be highly significant at P value 0.000. Using Wilcoxon signed rank test after treatment the symptom reduction was 58.62% which is highly significant at P Value and after follow-up the improvement is 92.04% is highly significant at P Value 0.000

Effect of Selected Pranayama on Palpitation in Group A: Statistical analysis showed that before the treatment the mean rank of Palpitation was found to be 3.20 and after treatment it was reduced to 2.24, after follow up the mean rank was 1.68 on 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.003. Using Wilcoxon signed rank test after treatment of the symptom reduction was 19.14% which is statistically significant at p 0.003 but after follow up the improvement is 38% which is highly significant at P Value 0.000.

Effect of Selected Yogasanas & Pranayama on Palpitation in Group B: Statistical analysis showed that before the treatment the mean rank of Palpitation was found to be 3.64 and after treatment it was reduced to 2.86, after follow up the mean rank was 1.50 on 90th day. Using Friedman's test it was found to be statistically significant at 0.005. Using Wilcoxon signed rank test after treatment of the symptom reduction was about 39.5% which is highly significant at P Value 0.000 and after follow up the improvement is increased to 82% which is highly significant P value 0.000.

Effect of Selected Pranayama on Fatigue in Group A: Statistical analysis showed that before the treatment the mean rank of fatigue was found to be 3.22 and after treatment it was reduced to 2.84, after follow-up the mean rank was 1.66 on 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.001. Using Wilcoxon signed rank test after treatment of the symptom reduction was about 20% which is statistically significant at P Value 0.005 and after follow up the improvement is increased to 45.45% which is highly statistically significant at P value 0.000.

Effect of Selected Yogasanas and Pranayama on Fatigue in Group B: Statistical analysis showed that before the treatment the mean rank of fatigue was found to be 3.80 and after treatment it was reduced to 2.82, after follow up the mean rank was 1.58 0n 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.001. Using Wilcoxon signed rank test after treatment of the symptom reduction was about 58.33% which is highly significant at P 0.000 and after follow up the improvement is increased to 85.71% which is highly significant at P value 0.000.

Effect of Selected Pranayama on Weakness in Group A: Statistical analysis showed that before the treatment the mean rank of Weakness was found to be 3.22 and after treatment it was reduced to 2.26, after follow up the mean rank was 1.54 on 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.001. Using Wilcoxon signed rank test during treatment the symptom reduction was 7.89% which was not statistically significant at P Value 0.083 and after treatment of the symptom reduction was about 25.7% which is statistically significant at P Value 0.003 and after follow up the

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improvement is increased to 46% which is highly significant at P value 0.000.

Effect of Selected Yogasanas & Pranayama on Weakness in Group B: Statistical analysis showed that before the treatment the mean rank of Weakness was found to be 3.78 and after treatment it was reduced to 1.88, after follow-up the mean rank was 1.66 on 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.001. Using Wilcoxon signed rank test after treatment of the symptom reduction was about 60% which is highly significant at P Value 0.000 and after follow up the improvement is increased to 86.2% which is also highly significant at P Value 0.000.

Effect of Selected Pranayama on Depression in Group A: Statistical analysis showed that before the treatment the mean rank of Depression was found to be 3.04 and after treatment it was reduced to 2.30, after follow-up the mean rank was 1.74 on 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.001. Using Wilcoxon signed rank test after treatment of the symptom was reduced to about 23.52% only, which is statistically significant at P Value 0.008 and after follow up the improvement is the symptom was reduced to about 47.22% which is highly significant at P Value 0.000.

Effect of Selected Yogasanas & Pranayama on Depression in Group B: Statistical analysis showed that before the treatment the mean rank of Depression was found to be 3.58 and after treatment it was reduced to 1.96, after follow up the mean rank was 1.74 0n 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.001. Using Wilcoxon signed rank test during treatment, the symptom was reduced to 19.44% which is not statistically significant at P Value 0.202 and after treatment improvement was 30.23% which was statistically significant at 0.001. After follow-up the improvement is the symptom was reduced to about 60.46% which is highly significant at P Value 0.000.

Effect of Selected Pranayama on Insomnia in Group A: Statistical analysis showed that before the treatment the mean rank of Insomnia was found to be 3.44 and after treatment it was reduced to 2.14, after follow up the mean rank was 1.68 on 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.001. Using Wilcoxon signed rank test after treatment of the symptom reduction was about 24.32% which is statistically significant at P Value 0.007 and after follow-up the improvement is increased to 55.31% which is highly significant at P Value 0.000.

Effect of Selected Yogasanas & Pranayama on Insomnia in Group B: Statistical analysis showed that before the treatment the mean rank of Insomnia was found to be 3.54 and after treatment it was reduced to 2.00, after follow up the mean rank was 1.82 on 90th day. Using Friedman's test it was found to be statistically significant P Value 0.001. Using Wilcoxon signed rank test after treatment of the symptom reduction was about 54.54% which is statistically significant at P Value 0.003 and after follow-up the improvement is increased to 84.61% which is highly significant at P Value 0.000.

Effect of Selected Pranayama on Irritability in Group A: Statistical analysis showed that before the treatment the mean rank of Irritability found to be 3.32 and after treatment it was reduced to 2.22, after follow-up the mean rank was 1.54 on 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.001. Using Wilcoxon signed rank test after treatment of the symptom reduction was about 21.95% which is statistically significant at P Value 0.003 and after follow up the improvement was about 54.34% which is highly significant at P 0.000.

Effect of Selected Yogasanas & Pranayama on Irritability in Group B: Statistical analysis showed that before the treatment the mean rank of Irritability found to be 3.90 and after treatment it was reduced to 1.92, after follow-up the mean rank was 1.48 on 90th day. Using Friedman's test it was found to be statistically significant at P value 0.001. Using Wilcoxon signed rank test after treatment of the symptom reduction was about 40% which is statistically significant at P value 0.000 and after follow up the improvement was about 74.94% which is statistically significant at P value 0.000.

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Effect of Selected Pranayama on Anxiety in Group A: Statistical analysis showed that before the treatment the mean rank of Anxiety was found to be 3.42 and after treatment it was reduced to 2.14, after follow-up the mean rank was 1.54 on 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.001. Using Wilcoxon signed rank test after treatment of the symptom reduction was about 24.39% which is statistically significant at P Value 0.004 and after follow up the improvement is increased to 50% which is highly significant at P 0.000.

Effect of Selected Yogasanas & Pranayama on Anxiety in Group B: Statistical analysis showed that before the treatment the mean rank of Anxiety was found to be 3.64 and after treatment it was reduced to 1.92, after follow-up the mean rank was 1.44 on 90th day. Using Friedman's test it was found to be statistically significant at P Value 0.005. Using Wilcoxon signed rank test after treatment of the symptom reduction was about 44.18% which is highly significant at P Value 0.000 and after follow-up the improvement is increased to 74.5% which is also highly significant at P Value 0.000.

Comparison of effect of treatment among study groups

Table 2: Comparison of effect of treatment on irregular menstruation.

Irregular Menstruation	Grade	Group A		Group B		Test Statistics
Duration		N	%	N	%	U=295.500
30th day	0	1	4	1	4	P=0.722
	1	11	44	10	40	
	2	10	40	10	40	
	3	3	12	4	16	
60th day	0	3	12	4	16	U=259.500
	1	10	40	12	48	P=0.269
	2	9	36	9	36	
	3	3	12	0	0	
90th day	0	5	20	9	36	U=236.500
	1	12	48	12	48	P=0.111
	2	7	28	4	16	
	3	1	4	0	0	

From the above table it is clear that at the level of 30th day comparison, there is no significant difference between the groups in their level of reduction in Irregular Menstruation. Mann-Whitney U value 295.500 was found to be not significant at P Value 0.269. Also on 60th and 90th day there was no difference between the groups in the reduction of Irregular Menstruation as the observed U value was 259.500 and 236.500 respectively was found to be statistically not statistically significant at P Value 0.269 and 0.111 respectively.

Table 3: Comparison of effect of treatment on hot flushes.

Hot Flushes	Grade	Group A		Group B		Test Statistics
Duration		N	%	N	%	U=245.500
30th day	0	1	4	4	16	P=0.167
	1	5	20	5	20	
	2	11	44	12	48	
	3	8	32	3	12	
	4	0	0	1	4	
60th day	0	2	8	15	60	U=94
	1	8	32	8	32	P=0.000
	2	11	44	2	8	
	3	4	16	0		
	4	0	0	0	0	

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90th day	0	4	16	21	84	U=100.00 P=0.000
	1	11	44	2	8	
	2	9	36	2	8	
	3	1	4	0	0	
	4	0	0	0	0	

From the above table it is clear that on 30th day comparison, there is no significant difference between the groups in their level of reduction in Hot Flushes. Mann-Whitney U value 245.500 was found to be not significant at P Value 0.269. But on 60th day after treatment, in Group B 60% of subjects had reduction in Hot Flushes of Grade 0 (No hot flushes) when compared to Group B with Mann-Whitney U value of 94.00 found to be significant at P Value 0.000. Further after 30 days of follow-up in Group B 84% subjects had reduction of hot flushes to Grade 0 when compared to Group A with U value 100 which is significant at P Value 0.000.

Table 4: Comparison of effect of treatment on night sweat.

Night Sweats	Grade	Group A		Group B		Test Statistics
Duration		N	%	N	%	U=287.500 P=0.605
30th day	0	4	16	6	24	
	1	11	44	10	40	
	2	9	36	8	32	
	3	1	4	1	4	
60th day	0	5	21	15	60	U=177.500 P=0.004
	1	14	56	8	32	
	2	6	24	2	8	
	3	0	0	0	0	
90th day	0	7	28	21	84	U=129.500 P=0.000
	1	14	56	4	16	
	2	4	16	0	0	
	3	0	0	0	0	

From the above table it is clear that on 30th day comparison, there is no difference between the groups in their level of reduction in Night Sweats. Mann-Whitney U value 287.500 was found to be not significant at P Value 0.605. But on 60th day after treatment in Group B 60% of subjects had reduction in Night Sweats of Grade 0 (Not at all) when compared to Group B with Mann-Whitney U value of 177.500 found to be significant at P Value 0.004. Further after 30 days of follow-up in Group B 84% subjects had reduction of Night Sweats to Grade 0 when compared to Group A with U value 129.500 which is significant at P Value 0.000.

Table 5: Comparison of effect of treatment on palpitation.

Palpitation	Grade	Group A		Group B		Test Statistics
Duration		N	%	N	%	U=203.000 P=0.022
30th day	0	0	0	4	16	
	1	7	28	11	44	
	2	15	60	8	32	
	3	3	12	1	4	
	4	0	0	1	4	
60th day	0	2	8	9	36	U=146.000 P=0.001
	1	9	36	13	52	
	2	13	52	3	12	
	3	1	4	0	0	
	4	0	0	0	0	
90th day	0	5	20	16	64	U=125.500 P=0.000
	1	9	36	9	36	

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	2	11	44	0	0	
	3	0	0	0	0	
	4	0	0	0	0	

From the above table it is clear that on 30th day comparison, there is difference between the groups in their level of reduction in Palpitation. Mann-Whitney U value 203.000 was found to be significant at P Value 0.022. But on 60th day after treatment in Group B 36% of subjects had reduction in Palpitation of Grade 0 (No palpitation) when compared to Group B with Mann-Whitney U value of 140.00 found to be significant at P Value 0.001. Further after 30 days of follow-up in Group B 64% subjects had reduction of Palpitation to Grade 0 when compared to Group A with U value 125.500 which is significant at P Value 0.000.

Table 6: Comparison of effect of treatment on fatigue.

Fatigue	Grade	Group A		Group B		Test Statistics
Duration		N	%	N	%	U=188.00 P=0.007
30th day	0	0	0	6	24	
	1	14	56	14	56	
	2	8	32	5	20	
	3	3	12	0	0	
60th day	0	3	12	16	64	U=120.00 P=0.000
	1	13	52	8	32	
	2	8	32	1	4	
	3	1	4	0	0	
90th day	0	7	28	19	76	U=144.500 P=0.000
	1	12	48	6	24	
	2	6	24	0	0	
	3	0	0	0	0	

From the above table it is clear that on 30th day comparison, there is difference between the groups after treatment in their level of reduction in Fatigue. Mann-Whitney U value 188.000 was found to be significant at P Value 0.007. But on 60th day after treatment in Group B 64% of subjects had reduction in Fatigue of Grade 0 (No Fatigue) when compared to Group B with Mann-Whitney U values of 120.00 found to be significant at P Value 0.000. Further after 30 days of follow-up in Group B 76% subjects had reduction of Fatigue to Grade 0 when compared to Group A with U value 144.500 which is significant at P Value 0.000.

Table 7: Comparison of effect of treatment on weakness.

Weakness	Grade	Group A		Group B		Test Statistics
Duration		N	%	N	%	
30th day	0	3	12	8	32	U=196.00 P=0.012
	1	13	52	15	60	
	2	5	10	1	4	
	3	4	16	1	4	
60th day	0	8	32	18	72	U=170.500 P=0.002
	1	10	40	6	24	
	2	5	20	1	4	
	3	2	8	0	0	
90th day	0	12	48	21	84	U=194.000 P=0.006
	1	10	40	4	16	
	2	3	12	0	0	
	3	0	0	0	0	

From the above table it is clear that at the level of 30th day comparison, there is significant difference between the groups in their level of reduction in Weakness. Mann-Whitney U value 196.00 was found to be significant at P Value 0.012. Also on 60th and 90th

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day also there was no difference between the groups in the reduction of Weakness was observed where in U value was 259.500 and 236.500 respectively. This was found to be statistically significant at P Value 0.002 and 0.006 respectively.

Table 8: Comparison of effect of treatment on depression.

Depression	Grade	Group A		Group B		Test Statistics
Duration		N	%	N	%	
30th day	0	1	4	3	12	U=266.500
	1	15	60	16	64	P=0.302
	2	8	32	4	16	
	3	1	4	2	8	
	4	0	0	0	0	
60th day	0	4	16	11	44	U=245
	1	16	64	9	36	P=0.154
	2	5	20	4	16	
	3	0	0	1	4	
	4	0	0	0	0	
90th day	0	10	40	12	48	U=291.500
	1	11	44	9	36	P=0.658
	2	4	16	4	16	
	3	0	0	0	0	
	4	0	0	0	0	

From the above table it is clear that at the level of 30th day comparison, there is no significant difference between the groups in their level of reduction in Depression. Mann-Whitney U value 265.500 was found to be not significant at the level 0.302. Also on 60th and 90th day also there was no difference between the groups in the reduction of Depression was observed where in U value was 245.00 and 291.500 respectively. This was found to be statistically not statistically significant at P Value 0.154 and 0.658 respectively.

Table 9: Comparison of effect of treatment on insomnia.

Insomnia	Grade	Group A		Group B		Test Statistics
Duration		N	%	N	%	
30th day	0	3	12	11	44	U=198.00
	1	9	36	7	28	P=0.020
	2	11	44	6	24	
	3	2	8	1	4	
	4	0	0	0	0	
60th day	0	5	20	16	64	U=157.00
	1	14	56	8	32	P=0.001
	2	4	16	1	4	
	3	2	8	0	0	
	4	0	0	0	0	
90th day	0	8	32	20	80	U=161
	1	13	52	4	16	P=0.001
	2	4	16	1	4	
	3	0	0	0	0	
	4	0	0	0	0	

From the above table it is clear that on 30th day comparison, there is difference between the groups in their level of reduction in Insomnia. Mann-Whitney U value 198.00 was found to be significant at P Value 0.020. But on 60th day after treatment in Group B 64% of subjects had reduction in Insomnia of Grade 0(Normal satisfactory sleep) when compared to Group B with Mann-Whitney U value of 157 found to be significant at 0.001. Further after 30 days of follow up in Group B 80% subjects had reduction of Insomnia to

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Grade 0 when compared to Group A with U value 161 which is significant at 0.001.

Table 10: Comparison of effect of treatment on irritability.

Irritability	Grade	Group A		Group B		Test Statistics
Duration		N	%	N	%	
30th day	0	2	8	5	20	U=275.500 P=0.443
	1	10	40	7	28	
	2	8	32	11	44	
	3	5	20	2	8	
	4	0	0	0	0	
60th day	0	5	20	9	36	U=227.500 P=0.080
	1	10	40	11	44	
	2	8	32	5	20	
	3	2	8	0	0	
	4	0	0	0	0	
90th day	0	8	32	15	60	U=222.000 P=0.054
	1	13	52	8	32	
	2	4	16	2	8	
	3	0	0	0	0	
	4	0	0	0	0	

From the above table it is clear that at the level of 30th day comparison, there is no significant difference between the groups in their level of reduction in Irritability. Mann-Whitney U value 275.500 was found to be not significant at the level 0.443. Also on 60th and 90th day also there was no difference between the groups in the reduction of Depression was the observed wherein U value was 227.500 and 222.000 respectively. This was found to be statistically not statistically significant at P Value 0.080 and 0.054 respectively.

Table 11: Comparison of effect of treatment on anxiety.

Anxiety	Grade	Group A		Group B		Test Statistics
Duration		N	%	N	%	
30th day	0	2	8	3	12	U=285.00 P=0.549
	1	8	32	3	12	
	2	12	48	17	68	
	3	3	12	2	8	
60th day	0	5	20	6	24	U=245.500 P=0.161
	1	9	36	14	56	
	2	11	44	5	20	
	3	0	0	0	0	
90th day	0	7	28	15	60	U=223.500 P=0.62
	1	13	52	6	24	
	2	5	20	4	16	
	3	0	0	0	0	

From the above table it is clear that at the level of 30th day comparison, there is no significant difference between the groups in their level of reduction in Anxiety. Mann-Whitney U value 285.500 was found to be not significant at the level 0.549. Also on 60th and 90th day also there was no difference between the groups in the reduction of Depression was the observed wherein U value was 245.500 and 223.500 respectively. This was found to be not statistically significant at P Value 0.161 and 0.62 respectively.

DISCUSSION

Irregular Menstruation

In the present study, all the subjects had the symptom of Irregular Menstruation. This shows that, in Perimenopause stage there will be abnormal pattern of menstruation. This can be supported by the

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previous work done with the hypothesis that elevated estradiol levels were behind Perimenopausal experiences i.e. increasing heavy flow, increased premenstrual syndrome in cycles documented with the Daily Perimenopause Dairy.[14]

Physiological Symptoms

Hot Flushes in this study maximum subjects i.e. 21% hot daily 1-2 time and increased at the time stress but do not disturb the routine work (Grade 2) and also 21% subjects had daily more than 5-6 times even without any stress and feeling disturbance in routine work (Grade 3). It is often referred to as vasomotor symptoms because the hormonal changes which interrupts the nor epinephrine and dopamine neurotransmitter balance.[15]

Night Sweats is seen in maximum subjects i.e. 64% had the feeling of quite a little night sweats (Grade2), 24% had the feeling of little nigh sweat (Grade 1) and 12% subjects had extreme sweating at night affecting the sleep.

Palpitation in this study, maximum subjects i.e. 44% subjects had palpitations on walking small distance or on excitement and 48% subjects with palpitation on climbing and even on talking a little loud or on hearing loud voice (Grade 1 and Grade 3). 4% of the subjects had the feeling of palpitation on any apparent cause like fearing, exciting, irritating thoughts (Grade 4). This is often associated with hot flushes and anxiety.

Fatigue symptom was present in maximum subjects. Sleep deprivation can be one of the reasons associated with increased fatigue and low energy levels. Inactivity induces muscular catabolism, which may negatively affect performance; therefore, more effort is required to carry out daily activities.[16]

Weakness is associated with fatigue. In this study, 60% of the subjects had slight weakness but their work can be completed (Grade 1), followed by 26% having weakness due to which their work is interrupted (Grade 2) and rest 14% had weakness affecting their routine work. This is also because of change in the hormonal levels. Oestrogen, progesterone, thyroid and adrenal hormones are all involved in the regulation of cellular energy in the body which when compromised can lead to weakness.

Psychological Symptoms

It is experienced by most of the women in this age group and is largely depending on the personality of the women. In this study majority of subjects experienced depressive mood. Among that 56% subjects were having occasional depression (Grade 1), 24% with grade 2, 18% with grade 3 and only 2% had no depression at all. The women experienced most symptoms of depression during the menopausal transition. In the United States, a study of a community sample of women undergoing natural menopause also demonstrated an increase in depressive symptoms during perimenopause.[17]

In this study 90% of the subject had insomnia symptoms. Insomnia occurs in 40-50% of women during the menopausal transition and problems with sleep may or may not be connected to mood disorders.[18]

In this study all the subjects had the symptoms of irritability of different grading. Irritability generally occurs during the period of transition to menopause. Women in the early Perimenopause are at a higher risk of getting irritable. 94% subjects in this study had the symptoms of mood swings. Mood swings are defined as extreme fluctuations in mood in Peri and Post-menopausal women are also attributed to decreased estrogen levels and the altered estrogen-serotonin interaction. In this study 100% subjects had the anxiety symptoms. Irritability manifests in one or more of the following ways, the extreme manifestations being anxiety.

Discussion on comparison of effect of treatments among two groups

The effect of both treatments in Group A and Group B was compared using Non Parametric test i.e. Mann-Whitney U test was done. When the scores after treatment i.e. on 60^{th} day and after follow up i.e. on 90^{th} day were compared. A statistically not significant of $p>0.05$ was obtained during 30 days of treatment in Hot Flushes, Palpitation, Fatigue and Insomnia. And

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after treatment i.e. on 60th day and after follow-up 90th day a statistical significance of p 0.05. Based on this study conducted, it can be inferred that the optimum number of day duration for the Selected Yogasanas and Pranayama in Perimenopausal women shall be 60 days.

Discussion on effect of selected Yoga techniques on Perimenopausal Symptoms

Perimenopause brings about physiological, psychological and hormonal changes within the body, which may have an unbearable effect on some women. Because of shift in the hormonal levels of menopausal transition, there are several common symptoms around this time of life. These symptoms were categorized in to physiological and psychological symptoms. Many of these women expressed their distress and helplessness regarding these symptoms, which were seriously affecting their day today life. This study discusses the clinical utility of selected yoga techniques in significantly reducing the Perimenopausal symptoms in all domains and thereby improving their living.

Asanas, Pranayama and the components of selected Yoga techniques seem to improve the symptom profile in the domains through several physiological and biochemical mechanisms. By practicing it helps to improve the physical strength and fitness through improving muscular strength, flexibility, cardio respiratory fitness and pulmonary function. A study by Tuzun S et.al. also supported this statement that Yoga education has a positive effect on pain, physical functions.

Psychological symptoms like depression, Insomnia, Irritability, Mood swing and Anxiety, all were significantly improved after Selected Yogasanas and Pranayama. Practice of Pranayama, Yoga and meditation controls the limbic hypothalamus axis. This reduces the anxiety and reduces the high level of stress hormones present in the blood. It also increases the level of beneficial hormones like adrenaline and encephalin. These two hormones have positive effect on our body and strengthen the immunity system.[19]

CONCLUSION

Selected Pranayama techniques is effective in reducing the Perimenopause symptoms like Hot Flushes, Night Sweats, Palpitation, Fatigue, weakness, Insomnia and Irritability. Selected Yogasanas and Pranayama are effective in reducing the symptoms of Perimenopause. On comparing, Selected Yogasanas and Pranayama are highly effective in treating the physiological and psychological symptoms of Perimenopause than Selected Pranayama. Thus, Perimenopause condition will be effectively managed with Selected Yogasanas and Pranayama.

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