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Surya Namaskar Yoga and Chamomile Essential Oil Aromatherapy on Hot Flashes and Insomnia in Perimenopausal Women

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Abstract

As women approach perimenopause, aging of the ovaries causes a decrease in estrogen production. The inability to maintain adequate estrogen levels, whether due to low production or other factors, can cause a variety of physical and psychological changes, including irregular periods, hot flashes, and insomnia. The purpose of this study was to find the effectiveness of Surya Namaskar Yoga and Chamomile Essential Oil Aromatherapy on Hot Flashes and Insomnia in Perimenopausal Women. This was a quasi-experimental study with a control group design. The sample size of this study used the Slovin formula to obtain 80 respondents. Bivariate data using the Kolmogorov Smirnov test, if the data is normally distributed then using the paired sample t-test, and to compare between the control group and the treatment group using the ANOVA test. The results for comparing the control and treatment groups obtained p = 0.031, which means that there was a significant difference in the post-test value of insomnia complaints between the control and treatment groups, and p 0.041 < α 0.05. P 0.007 < α 0.005, meaning there was a significant difference in the post-hot Flashes complaint value between the control and treatment groups. The combination of Suryanamaskar yoga and chamomile aromatherapy provides a synergistic effect in improving insomnia and hot Flashes. It is expected that yoga and chamomile aroma therapy can be used to perimenopausal women so that they can prevent the uncontrollable perimenopause syndrome.

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INTRODUCTION

Perimenopause is a physiological condition that every woman will experience, premenopause is around 40 years old to early 58 years old (Brinton et al., 2015). WHO (World Health Organization) data, around 1.2 billion women worldwide will enter menopause in 2030 and in Indonesia around 60 million women will enter menopause in 202 (Nadia et al., 2024). The population of Indonesia as of June 11, 2024 aged 40-54 years was 28,233.5 thousand (Badan Pusat Statistik, 2024). The speed of menopause is influenced by many factors, one of which is geographical factors, where geographical factors include place of residence (village and city) along with other factors such as lifestyle, social status, economics and genetics (Ceylan & Özerdoğan, 2015).

As women approach perimenopause, aging of the ovaries causes a decrease in estrogen production, which then causes an increase in gonadotropin hormone levels (specifically follicle-stimulating hormone or FSH) as the brain tries to stimulate the ovaries to produce more estrogen (Davis et al., 2023). The inability to maintain adequate estrogen levels, whether due to low production or other factors, can cause a variety of physical and psychological changes, including hot flashes and insomnia (Albert & Newhouse, 2019). Hot Flashes are the most common vasomotor symptom experienced during premenopause, almost 85% of women experience this symptom (Bansal & Aggarwal, 2019). Among perimenopausal symptoms, sleep disturbance is one of the most bothersome, and is reported by 40–60% of perimenopausal women (Baker et al., 2018).

Perimenopause symptoms such as hot Flashes and insomnia can be reduced by doing several non-pharmacological therapies or complementary therapies, one of which is Suryanamaskar Yoga (Gangadharan et al., 2024), dan aromateraphy chamomile essential oil can be reduce of perimenopausa symtoms (Tangkeeratichai et al., 2025). Suryanamaskar yoga was first introduced by King Aundh, Shrimant Balasaheb Pant Pratinidhi in the 1920s (Prasanna Venkatesh & Vandhana, 2022). The yoga technique of surya namaskar is a unique combination of 11 movements that include asana wich means postures, and pranayama wich means yogic breathin, than dharana or mind-fixing which helps achieve concentration (Stec et al., 2023). Suryanamaskar yoga movements can help reduce joint pain, excessive sadness, panic attacks and anxiety during the period approaching menopause (Gaikwad et al., 2015). Yoga Suryanamaskar is beneficial because it's a holistic practice that combines physical such as asanas, and pranayama, than dhyana or meditation to positively impact the nervous and hormonal systems, helping the body and mind adapt to changes like hormonal fluctuations (Das, 2023). This opinion is supported by research from Paasi in India which proves that the Suryanamaskar yoga movement can improve sleep quality or insomnia, and reduce stress in the elderly. (Paasi et al., 2022). Yoga is believed to reduce the action of hypothalamus to pituitary on adrenal (HPA) axis which can release steroid hormones, namely the hormone cortisol and regulates the function of catecholamine hormones include adrenaline, noradrenaline and dopamine released from the Sympathetic Nervous System (SNS) (Padmavathi et al., 2023). Although the direct effects of yoga on the hipothalaun pituitary adrenal axis or sympathetic nervous system are unknown, it has been hypothesized that certain yoga practices cause a shift in parasympathetic nervous system dominance through nervus vagus stimulation, thereby counteracting the effects of stressors (Pakulanon et al., 2024). Aromatherapy chamomile essential oil contains apigenin, a calming flavonoid, which can help overcome insomnia and reduce symptoms of hot Flashes by acting as a partial agonist on estrogen receptors, which can then help regulate estrogen levels (Yao et al., 2021).

METHODS

The design used in this research was a quasi experimental with a control group design. This study emphasized the observation of independent variable data. This study provided a combination of 12 basic yoga movements of Surya Namaskar and

Chamomile essential oil aromatherapy in the treatment group, while the control group was only observed for hot Flashes and insomnia. This research was conducted in Jatinom Village, Kanigoro District, Blitar Regency. The population in this research was 100 perimenopausal women. The sampling technique used was purposive sampling. The sample size of this study used the Slovin formula to obtain 80 respondents. Inclusion criteria: 1) Women aged 45-50 years, 2) experiencing hot Flashes and insomnia, 3) present at the research location, 4) signing the IC. Exclusion criteria: 1) premenopausal women who have cancer or tumors, 2) experiencing mental disorders, 3) experiencing hearing impairment. The independent variables were surya namaskar yoga and chamomile essential oil aromatherapy. The dependent variables were hot Flashes and insomnia in perimenopausal women. The data collection was conducted in the treatment group, which received a combination of Suryanamaskar yoga and Chamomile essential oil aromatherapy, eight times over four weeks. Each session lasted 60 minutes. The yoga instructor was the researcher, who holds a yoga training certificate. The control group was educated by applying cold compresses to warm areas of the face, neck, or chest every night or before bed.

There are 4 research instruments, including (1). Hot Flashes Rating Scale screening instrument to assess the extent to which premenopausal mothers experience hot flashes or not, and the extent to which hot flashes interfere with daily activities. (2) hot flashes using the Hot Flashes Rating Scale with an assessment of 1) the extent to which hot flashes are a problem with a score of 1-10, 2) worry about getting hot flashes with a score of 1-10, 3) how often hot flashes interfere with daily activities with a score of 1-10. The scores of these three points are added and divided by 3, a score of 1 means that no hot flashes occur, while a total score of 10 means experiencing severe hot flashes (Rendall et al., 2008). (3). The Insomnia Severity Index (ISI) questionnaire consists of 7 questions which are then totaled with the following total score categories: 0–7 = No clinically significant insomnia, 8–14 = Subthreshold insomnia, 15–21 = Clinical insomnia (moderate severity), 22–28 = Clinical insomnia (severe). The univariate data analysis using frequency distribution is the demographic data of respondents (age, duration of menstruation, duration of last menstruation, occupation, education), then for bivariate data using the Kolmogorov Smirnov test, if the data is normally distributed then using the paired sample t-test, and to compare between the control group and the treatment group using the ANOVA test. If the data is not normally distributed using the Spearman rank. This research has ethical standards with the number 06/PHB/KEPK/313/07.25 at STIKes Patria Husada Blitar.

RESULTS

The intervention used in this study was Surya Namaskar yoga combined with chamomile essential oil aromatherapy. This intervention was conducted eight times over four weeks. The study involved 80 respondents; The subjects are divided into two groups: 40 in the control group and 40 in the treatment groups: Research Result Data.

Table 1. Frequency distribution of respondent characteristics in the control and treatment groups (n=80)

Respondent Characteristics		Control group		Intervention group	
		Total	Precentage (%)	Total	Precentage (%)
Marital status	Unmarried	1	2,5	0	0
	Married	34	85	35	87,5
	Widow	5	12,5	5	12,5
Total		40	100	40	100
Education	Junior high school	15	37,5	2	5

	Senior high school	25	62,5	30	75
	University	0	0	8	20
Total		40	100	40	100
Occupation	Self-employed	10	25	5	12,5
	Civil servants	5	12,5	1	2,5
	House wife	20	50	34	85
Total		40	100	40	100

From the table above, it shows that the characteristics of respondents in the control group include: 85% are married and 12.5% are widows, then 62.5% have a high school education/equivalent, and 50% of respondents have jobs as housewives. The characteristics of respondents in the treatment group include: 87.5% of respondents are married and 12.5% are widows, then 75% have a high school education/equivalent and 20% have a college education, 85% of respondents are housewives.

Table 2. Distribution frequency of insomnia in the intervention and control group (n=80)

Insomnia Category	**Control group**				**Intervention group**			
	Before		**After**		**Before**		**After**	
	∑	**%**	∑	**%**	∑	**%**	∑	**%**
No clinically significant insomnia	10	25	13	32,5	6	15	21	52,5
Subthreshold insomnia	21	52,5	21	52,5	13	32,5	13	32,5
moderate severity	5	12,5	5	12,5	8	20	6	15
severe	4	10	1	2,5	13	32,5	0	0
kolmogrov smirnov	p=0,140				p=0,215			
paired sample t-test	p=0,071				p=0,000			
Anova	p=0.041							

In the control group, no treatment was given, but respondents were given cold compresses on the face, neck, or chest area that felt warm every night or before going to sleep. The pre-test results in the control group showed that 52.5% experienced Subthreshold insomnia, 12.5% experienced moderate severity, then the post-test results showed that 52.5% experienced Subthreshold insomnia. In the treatment group, before treatment, around 32.5% of respondents experienced Subthreshold insomnia, 20% of respondents experienced moderate severity. Then after treatment, 52.5% of respondents were in the No clinically significant insomnia category and 32.5% experienced Subthreshold insomnia. The results of the normality test in the control group were p = 0.140, meaning the data was normally distributed, and the results of the difference test proved p = 0.071, which means that there was no difference before and after with p 0.071 > α 0.05. Meanwhile, in the treatment group, the results of the normality test were obtained, namely p = 0.215, which means the data was normally distributed, then the results of the difference test before and after treatment were p =

0.005, which means there was a difference before and after at p 0.000 < 0.05. The results for comparing the control and treatment groups obtained p = 0.031, which means that there was a significant difference in the post-test value of insomnia complaints between the control and treatment groups at p 0.041 < α 0.05.

Table 3. Distribution of frequency of Hot Flashes in the intervention and control groups (n=80)

Hot Flashes category	**Control group**				**Intervention group**			
	Before		**After**		**Before**		**After**	
	∑	**%**	∑	**%**	∑	**%**	∑	**%**
No Problem	10	25	10	25	13	32,5	33	82,5
Mild	11	27,5	17	42,5	9	22,5	5	2,5
Moderate	19	47,5	13	32,5	8	20	2	5
Severe	0	0	0	0	10	25	0	0
Kolmogrove smirnov	p=0,100				p=0,210			
paired sample t-test	p=0,080				p=0,000			
Anova	pvalue 0,007							

The pre-test results in the control group showed that 47% of respondents were in the moderate category, and the post-test results showed that 42.5% were in the mild category. While before intervention in the intervention group, 25% were in the severe category, and after treatment, 82.5% were in the no insomnia category. The results of the normality test in the control group showed that p = 0.100 > α 0.005, meaning the data were normally distributed. Then, the results of the difference test before and after treatment showed p = 0.080 > α 0.05, meaning there was no significant difference between before and after. While in the treatment group, the results for the normal test were p = 0.210 > α 0.005, meaning the data were normally distributed, then the results of the difference test showed p 0.000 < α 0.05, meaning there was a difference before and after treatment. The results of the ANOVA test showed that P 0.007 < α 0.005, meaning there was a significant difference in the post-hot Flashes complaint value between the control and treatment groups

DISCUSSION

This study used a modified Suryanamaskar yoga treatment tailored to the respondents' age. This yoga activity was combined with chamomile oil aromatherapy applied to diffusers. The diffusers were positioned at the front, back, and middle so that they could be inhaled by the respondents. This treatment was carried out eight times over four weeks.

Insomnia

The results showed that there was a significant difference between control group and treatment group in reducing insomnia during perimenopause. In this study, the Suryanamaskar movement was modified to suit the needs of the respondents, namely 40-50 years old, which focuses on stretching, strengthening, and aligning the body and mind. Yoga movements can stimulate a decrease in sympathetic nerve activity and increase parasympathetic nerve activity, resulting in a decrease in the hormones adrenaline, norepinephrine, and catecholamine, as well as vasodilation in the blood vessels, which results in a smooth process of transporting oxygen throughout the body, especially the brain (Khajuria et al., 2023). Especially in pranayama (breath control) and asana (pose) movements which can stimulate the transfer from the sympathetic nerves to the parasympathetic nerves (V. Singh, 2024). This research is also supported by previous research which states that the practice of suryanamaskar yoga has a positive effect

on perimenopausal women related to improving sleep quality and physical health (Chawla et al., 2022). Yoga movements can reduce menopausal syndrome, especially insomnia symptoms, to improve women's quality of life (Gangadharan et al., 2024). In addition to the Suryanamaskar yoga movements, chamomile oil aromatherapy is also provided.

Chamomile aromatherapy contains the substance apigenin which is found in various forms of glycosides and a little in the form of free apigenin (Bhukta et al., 2021). The apigenin substance contained in chamomile works with a hypnotic effect like benzodiazepine so that apigenin will bind GABA A in the central nervous system which can then cause a sedative effect in the form of stimulating drowsiness and muscle relaxation (Ebrahim et al., 2025). The working system of the apigenin substance is on the central nervous system, which affects the hypothalamus, pituitary, and limbic system so that chamomile can also reduce anxiety and prevent increased stress by inhibiting cortisol which is followed by a decrease in response to stressors (Saadatmand et al., 2024). This is supported by previous research which states that chamomile aromatherapy is effective in improving sleep quality, especially in perimenopausal women who have insomnia (Renosih et al., 2025). Research from Pudhucerry, South India, said that there was a significant difference between before and after chamomile aromatherapy to reduce insomnia complaints. (Catherin et al., 2021).

The combination of Suryanamaskar yoga and chamomile aromatherapy provides a synergistic effect in improving sleep disorders (Gao et al., 2022). Yoga prepares the body physically and mentally for sleep, while chamomile helps calm the mind (Turmel et al., 2022).

Hot Flashes

Perimenopause is a physiological transition period for women before menopause, characterized by fluctuations in estrogen and progesterone levels, and symptoms such as hot flashes and insomnia (Davis et al., 2023). One of the most common and bothersome symptoms is hot flashes, which are often accompanied by sweating, heart palpitations, anxiety, and chills (Swartling et al., 2021).

Results of the Suryanamaskar yoga treatment with a combination of chamomile aromatherapy, it was found that there was a difference before and after treatment. The results of the ANOVA test showed that P 0.007 < α 0.005, which means there was a significant difference in the post-hot Flashes complaint value between the control and treatment groups. These results are supported by previous research which stated that suryanamaskar yoga is effective in reducing the symptoms of hot flashes (Mohebi et al., 2023). Then, yoga intervention in the 45-50 year age group resulted in a decrease in menopausal symptoms, including hot flashes, stress and depression caused by increased cortisol (A. Singh et al., 2025). A study of 120 women aged 40-55 years who were given yoga treatment for 8 weeks showed significant improvements in menopausal symptoms (Maharana & Jayaprakash, 2023). This is because the Suryanamaskar yoga movement stimulates the endocrine system, namely the glandular system that produces and regulates hormones in the body (Prasanna Venkatesh & Vandhana, 2022). As for the glandular system, namely the thyroid gland system, which stimulates the neck and throat area in the cobra pose and shoulder stand movements, thereby helping to increase the production of thyroid hormones which function to stabilize body temperature (Menaka et al., 2025). Then Suryanamaskar helps increase the production of endorphins, serotonin, and dopamine, especially in the cobra pose, Padahastasana, and Ashwa Sanchalanasana movements (Nair, 2024).

The aromatherapy combination of chamomile essential oils in this study was administered during a Suryanamaskar yoga session. Chamomile aromatherapy contains apigenin, which binds to GABA-A receptors (Kramer & Johnson, 2024). Increased GABA-A activation can inhibit the release of norepinephrine and then reduce the sympathetic system, resulting in a decrease in hot flashes in the body (Sun et al., 2022).

CONCLUSION

Modification of Surya Namaskar yoga with a combination of chamomile essential oil

aromatherapy is effective for perimenopausal women with symptoms of insomnia and hot Flashes. The results of the difference test between the control and treatment groups were p 0.041 < α 0.05, which means there was a significant difference between the control and treatment groups in reducing insomnia symptoms and P 0.007 < α 0.005, which means there was a significant difference in the post-hot Flashes complaint value between the control and treatment groups.

SUGGESTION

The combination of Surya Namaskar yoga and chamomile essential oil aromatherapy can reduce perimenopausal symptoms, especially insomnia and hot Flashes. Surya Namaskar yoga movements have been modified to suit perimenopausal age, making them comfortable and easy to follow. Furthermore, chamomile essential oil aromatherapy enhances the effectiveness of reducing insomnia and hot Flashes due to its apigenin content. It is expected that yoga and chamomile aroma therapy can be used to perimenopausal women so that they can prevent the uncontrollable perimenopause syndrome.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest in this activity. The entire writing and publication process was carried out by the authors under a collaborative agreement with a partner, Jatinom Village, Kanigoro District, Blitar Regency.

AUTHOR CONTRIBUTIONS

Handayani was responsible for the study's concept development, data management, formal analysis. Levi Tina Sari contributed to the investigation, methodology, data collection, verification, and writing the original draft, as well as reviewing and editing. Ita Noviasari contributed to the investigation, as well as reviewing, editing the manuscript and provided the necessary resources

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