

Original Article

# Combination of Progressive Muscle Relaxation - Lavender Aromatherapy in Improving Sleep Quality in Menopausal Women: A Quasy Experiment

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| ARTICLE INFO  | ABSTRACT  |
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| <p><b>Article History</b><br/>           Submit : Oct 14, 2024<br/>           Revised : Dec 20, 2024<br/>           Accepted : Dec 26, 2024</p> <p><b>Keywords:</b><br/>           Progressive Muscle Relaxation,<br/>           Lavender Aromatherapy,<br/>           Sleep Quality,<br/>           Menopausal</p> | <p><b>Background:</b> Menopausal women often experience emotional disorders such as anxiety, irritability, and depression, as well as physical problems such as pain during intercourse, hot flashes, and sleep disturbances. Poor sleep quality is a significant complaint during menopause. This study aims to analyze the effect of the combination of Progressive Muscle Relaxation (PMR) and lavender aromatherapy on the sleep quality of menopausal women.</p> <p><b>Methods:</b> This quasi-experimental research uses a pretest-posttest approach with purposive sampling involving 20 menopausal female respondents at the Posyandu Elderly in Belangwetan Village, North Klaten, from July 14 to 29, 2024. The intervention combined PMR, which involves tensing and relaxing the muscles for 15-20 minutes daily while inhaling lavender aromatherapy.</p> <p><b>Results:</b> Before the intervention, the average sleep quality of the respondents was 17.25 (range 13-20), which decreased to 5.90 (range 4-9) after the intervention. The Wilcoxon test showed a p-value = 0.000, proving that this intervention improved sleep quality in menopausal women.</p> <p><b>Conclusion:</b> The combination of PMR and lavender aromatherapy effectively improves sleep quality because it helps relax muscles, activates the body's relaxation system, and is easy to apply.</p> |

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## Introduction

Menopause is a critical phase that every woman goes through, usually occurring at the age of 45-55 years when the ovaries stop producing the hormone estrogen. Decreased estrogen and progesterone during menopause increase health risks that affect women's quality of life. Psychologically, menopause often causes emotional disorders, such as anxiety,

irritability, difficulty concentrating, and depression. Physically, common symptoms include pain during sexual intercourse, changes in the menstrual cycle, hot flashes, respiratory problems, vaginal and dry skin, and sleep disturbances (Sari et al., 2020). During the menopausal transition, decreased sleep quality becomes a common and annoying problem. Hormonal imbalances due to hormonal changes cause



sleep disturbances in menopausal women. Several factors contribute to the decline in sleep quality, including health issues, environmental conditions, stress, anxiety, depression, medication use, and the positive effects of progressive muscle relaxation ([Sugijantoro et al., 2022](#)).

It is projected that by 2025, Indonesia will have 60 million women experiencing menopause. In 2016, the number of menopausal women in the country was 14 million, accounting for 7.4% of the total population. According to data from the Central Java Provincial Health Office, in 2022, 15,882 women aged 45-55 years were experiencing menopause ([Sugijantoro et al., 2022](#)). In an initial study on October 5, 2023, at the Posyandu Elderly in Belangwetan Village, North Klaten, of the 10 menopausal women interviewed, 7 complained of decreased sleep quality, while 3 others experienced other menopausal symptoms.

As women age, menopause and sleep disorders frequently occur, with many experiencing restlessness, frequent nighttime awakenings, and difficulty falling asleep. A prolonged decline in sleep quality can lead to a weakened immune system, decreased productivity, fatigue, stress, anxiety, depression, irritability, and poor concentration, all of which can negatively impact the individual and those around them ([Kanender et al., 2015](#)). Results ([Manurung & Adriani, 2017](#)) Progressive muscle relaxation has been shown to improve sleep quality. This technique involves focusing on muscle tension, identifying stress areas, and reducing that tension through relaxation, leading to calm and comfort. Providing health education to menopausal women about the long-term benefits of this technique can help alleviate symptoms and enhance sleep quality. If poor sleep quality is left unaddressed, it may result in a decline in physical strength.

For menopausal women, achieving good sleep quality involves effectively recognizing the underlying causes of sleep disturbances and knowing how to manage them ([Zulkharisma & Noorratri, 2022](#)).

One approach to improving sleep quality in menopausal women is relaxation. Progressive Muscle Relaxation (PMR) is a technique that directs attention to muscle activity, allowing individuals to identify areas of tension and release that tension through relaxation methods, ultimately promoting a sense of calm and relaxation ([Dewi et al., 2015](#); [Aprilyawan et al., 2021](#)). This is corroborated by research ([Sari et al., 2020](#)), which states that Porgrasif Muscle Relaxation (PMR) can improve sleep quality, including sleep time, sleep interval, sleep deficiency and sleep duration. Lavender aromatherapy can also be given to maximize relaxation in addition to PMR. This is supported by research ([Romadhon & Dewi, 2022](#); [Setyaningsih et al., 2023](#)), which states that the administration of lavender aromatherapy can improve the sleep quality of people with insomnia.

## Methods

Methods should be structured, including:

### Study Design

This research is quantitative research whose research design is a quick experiment with a pretest-posttest design approach.

### Sample/Participants

The research sample comprised 20 menopausal women from the Posyandu for the Elderly in Belangwetan Village, North Klaten District, Klaten Regency. The inclusion criteria were: aged 45-55 years, experiencing menopause, having difficulty sleeping, and being able to communicate effectively and cooperate.

### **Instrument**

Variabel Independent: Combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy. The PSQI questionnaire measured the dependent variable of sleep quality.

### **Intervention**

The combination technique of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy is a simple relaxation method involving two processes: tensing and relaxing the muscles, followed by relaxation. In this technique, each muscle group is tensed for 5-10 seconds and then relaxed for 30 seconds. The PMR is performed daily for 15-20 minutes, with one session per day, while simultaneously inhaling lavender aromatherapy.

### **Data Collection**

The research was conducted for 1 month, from July 14 to 29, 2024, at the Posyandu Elderly in Belangwetan Village, North Klaten District, Klaten Regency. The data collection techniques in this study are as follows: The researcher asks for permission for a preliminary survey and prepares a proposal; The researcher takes care of research licensing at the Nalanda Institute and to be addressed to the Head of Belangwetan Village, North Klaten District, Klaten Regency as a research site Determine the respondents who will be the subject of the research, then determine the sample according to the criteria that have been made; Prospective respondents were given

an explanation of the purpose and objectives, benefits and procedures of the Combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy techniques, risks from the action, confidentiality of data and losses incurred from research conducted on respondents; Asking for the willingness of prospective respondents to participate in the study by signing informed consent if willing and if the prospective respondents are not willing then the researcher does not coerce; Collect all respondents who will be given a combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy intervention at the Posyandu Elderly in Belangwetan Village, North Klaten District, Klaten Regency for 3 consecutive days, then train the respondents 3 times; Give posttest sheets to the intervention group and control group and give thanks for participating in this study.

### **Data Analysis**

The Wilcoxon Signed Rank Test was used to answer the hypothesis in this study.

### **Ethical consideration**

This research uses ethical principles: informed, anonymity, confidentiality, beneficence, non-maleficence, veracity and justice and has passed the ethical review of the KEP Nalanda Institute with number KET-0006/S1RPL1-DU/V/2024.

## Results

Table 1. Data on the frequency distribution of age, gender, education and Menarche of Menopausal Women

| Characteristic Data | n         |            |
|---------------------|-----------|------------|
|                     | Frequency | %          |
| <b>Age</b>          |           |            |
| 45 – 50 years old   | 8         | 40,0       |
| 51 – 55 years old   | 12        | 60,0       |
| <b>Total</b>        | <b>20</b> | <b>100</b> |
| <b>Education</b>    |           |            |
| Primary school      | 12        | 60,0       |
| Secondary school    | 7         | 35,0       |
| College             | 1         | 5,0        |
| <b>Total</b>        | <b>20</b> | <b>100</b> |
| <b>Menarche</b>     |           |            |
| 9-10 years old      | 3         | 15,0       |
| 11-12 years old     | 9         | 45,0       |
| 13-14 years old     | 4         | 20,0       |
| 15-16 years old     | 4         | 20         |
| <b>Total</b>        | <b>20</b> | <b>100</b> |

Based on Table 1, it was shown that the majority of respondents (60%) were aged between 51-55 years. Most respondents (60%) had received basic education. Nearly half of the respondents (45%) experienced menarche between 11 and 12.

## Sleep Quality

Table 2. Minimum value, maximum and average sleep quality before and after Progressive *Muscle Relaxation* (PMR) and Lavender Aromatherapy

| Sleep Quality      | n         | Minimum   | Maximum   | Mean      | SE        | SD        |
|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|
|                    | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic |
| Pre Interventions  | 20        | 13        | 20        | 17.25     | .523      | 2.337     |
| Post Interventions | 20        | 4         | 9         | 5.90      | .298      | 1.334     |

Before being given the Combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy intervention, the minimum sleep quality score was 13, the maximum was 20, and the overall average value was 17.25. Meanwhile, after being given the Combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy intervention, the minimum value of sleep quality was 4, the maximum was 9, and the overall average value was 5.90.

Table 3. Frequency distribution data of sleep quality of Menopausal Women before Combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy

| Variable      | Category      | Before the Intervention |      |
|---------------|---------------|-------------------------|------|
|               |               | n                       | %    |
| Sleep Quality | Quality       | -                       | -    |
|               | Less quality  | 2                       | 10,0 |
|               | Not Qualified | 18                      | 90,0 |
|               | Total         | 20                      | 100  |

Table 3 shows that the sleep quality of menopausal women before receiving the Combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy was predominantly poor, with 90% of participants experiencing low sleep quality.

Table 4. Frequency distribution data of sleep quality of Menopausal Women after Combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy

| Variable      | Category      | After the Intervention |      |
|---------------|---------------|------------------------|------|
|               |               | n                      | %    |
| Sleep Quality | Quality       | 17                     | 85,0 |
|               | Less quality  | 3                      | 15,0 |
|               | Not Qualified | -                      | -    |
|               | Total         | 20                     | 100  |

Table 4 shows that after receiving the combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy, the sleep quality of menopausal women significantly improved, with 85% of participants reporting high-quality sleep.

Table 5. Analysis of the Effect of Combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy on Sleep Quality in Menopausal Women

| Variable      | Category      | Before the Intervention |      | After the Intervention |      |
|---------------|---------------|-------------------------|------|------------------------|------|
|               |               | n                       | %    | n                      | %    |
| Sleep Quality | Quality       | -                       | -    | 17                     | 85,0 |
|               | Less quality  | 2                       | 10,0 | 3                      | 15,0 |
|               | Not Qualified | 18                      | 90,0 | -                      | -    |
|               | Total         | 20                      | 100  | 20                     | 100  |

The results of the statistical test using the Wilcoxon Signed Ranks Test obtained p value = 0.000

Based on Table 5, the results of the statistical analysis using the Wilcoxon Signed Ranks Test yielded a p-value of .000, indicating a significant effect of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy in improving the sleep quality of menopausal women at the Elderly Posyandu in Belangwetan Village, North Klaten District, Klaten Regency.



## Discussion

The research conducted at the Elderly Posyandu in Belangwetan Village, North Klaten District, Klaten Regency, as shown in Table 1, revealed that most respondents (60%) were aged 51-55 years. Most respondents (60%) had basic education, and nearly half (45%) experienced menarche between 11 and 12. Based on Table 3, it was found that before receiving the combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy, nearly all menopausal women (90%) had poor sleep quality. These findings are consistent with previous research ([Sugijantoro et al., 2022](#)), which states that the picture of sleep quality in menopausal women is not of good quality.

As mentioned above, women aged 51-55 experience hormonal changes, particularly in estrogen and progesterone levels, which can trigger behavioral changes, especially in sleep patterns. The decrease in progesterone levels plays a significant role in sleep disturbances. However, the decline in sleep quality can be effectively managed if menopausal women engage in physical exercises, such as Progressive Muscle Relaxation therapy, to improve sleep ([Sugijantoro et al., 2022](#)). Education plays a key role in helping individuals absorb and understand information. Many menopausal women rely solely on medication to address sleep disorders, often overlooking the importance of physical activity. In reality, physical activity is essential as it can help relieve muscle tension and promote a sense of relaxation ([Mazida & Wijaya, 2022](#)).

The results of the study conducted at the Elderly Posyandu in Belangwetan Village, North Klaten District, Klaten Regency, as shown in Table 4, indicated that after receiving the combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy, 85% of

menopausal women experienced improved sleep quality. Based on the hypothesis testing, the study concluded that the combination of PMR and Lavender Aromatherapy effectively enhanced the sleep quality of menopausal women at the Elderly Posyandu in Belangwetan Village, North Klaten District, Klaten Regency.

The combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy focuses attention on muscle activity, allowing individuals to identify areas of tension and alleviate it through relaxation techniques ([Sari et al., 2020](#)). The combination therapy of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy is also effective in reducing muscle tension, alleviating anxiety and depression, promoting better sleep, relieving fatigue and muscle cramps, and enhancing concentration ([Amanda, 2019](#)). The above is supported by the findings ([Ariana et al., 2020](#)), which state that progressive muscle relaxation accompanied by music can improve the sleep quality of menopausal women, including sleep time, sleep interval, sleep deficit, and sleep duration. In addition, research ([Ozkaraman et al., 2018](#)) states that lavender aromatherapy can lower anxiety levels and improve sleep quality.

The results of the research conducted at the Elderly Posyandu in Belangwetan Village, North Klaten District, Klaten Regency, as shown in Table 5, revealed that the statistical analysis using the Wilcoxon Signed Ranks Test yielded a p-value of .000. This indicates a significant effect of the combination of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy in improving the sleep quality of menopausal women at the Elderly Posyandu in Belangwetan Village, North Klaten District, Klaten Regency. According to research ([Ariana et al., 2020](#); [Aprilyawan et al., 2021](#)), Progressive

muscle relaxation can improve sleep quality. In addition, research ([Ozkaraman et al., 2018](#)) stated that lavender aromatherapy can lower anxiety levels and enhance sleep quality.

Menopause often causes sleep disturbances that impact a woman's quality of life, caused by hormonal fluctuations and significantly a decrease in estrogen and progesterone. A long-term decline in sleep quality can lead to weakened immunity, fatigue, depression, irritability, and decreased concentration. The combination of Progressive Muscle Relaxation (PMR) and lavender aromatherapy is a non-pharmacological approach that can effectively help improve sleep quality ([Zulkharisma & Noorratri, 2022](#)). The Combination Technique of Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy is a simple relaxation that goes through two processes, namely, tense and relax the muscles of the body and become relaxed. A combination of progressive Muscle Relaxation (PMR) and Lavender Aromatherapy movements, each muscle movement is tensed for 5-10 seconds, then ends with a relaxed state for 30 seconds. Progressive muscle relaxation is done with a duration of 15-20 minutes a day and 1 time a day and at the time of doing it while inhaling lavender aromatherapy. This is because Progressive Muscle Relaxation (PMR) works by focusing on muscle activity, identifying areas of tension, and reducing that tension through relaxation techniques to achieve a state of relaxation ([Munira et al., 2020](#)). This therapy can also improve sleep quality by activating the parasympathetic nervous system, which helps achieve a state of relaxation and calmness. This sensation is transmitted to the hypothalamus, triggering the release of corticotropin-releasing factor, which stimulates the pituitary gland. These glands promote the production of

hormones such as endorphins, enkephalins, and serotonin, which contribute to improved sleep quality in menopausal women.

Combining Progressive Muscle Relaxation (PMR) and Lavender Aromatherapy effectively improves sleep quality in menopausal women. Progressive muscle relaxation targets the muscles of the head, neck, arms, and back in a controlled manner, counteracting the sympathetic nervous system to promote relaxation and calm ([Permatasari et al., 2022](#)). This sense of relaxation is transmitted to the hypothalamus, which produces corticotropin-releasing factor (CRF) that stimulates the pituitary gland to release hormones such as endorphins, enkephalins, and serotonin. The fulfilment of sleep needs is facilitated by a reduction in the activity of the Reticular Activating System (RAS) and norepinephrine, as well as a decrease in brainstem system activity. The relaxation response arises from stimulation in the parasympathetic autonomic nervous system, which decreases oxygen function, respiratory rate, pulse rate, muscle tension, blood pressure, and alpha waves in the brain, making it easier for a person to fall asleep ([Amanda, 2019](#)).

Researchers state that based on theory and research, the combination of Progressive Muscle Relaxation (PMR) and lavender aromatherapy is highly recommended to improve sleep quality in menopausal women. This technique is easy to perform and has minimal side effects. More research is needed to optimize the protocol and understand the biological mechanisms underlying these positive effects.

## Conclusion

In conclusion, the combination of Progressive Muscle Relaxation (PMR) and lavender aromatherapy has been shown to

significantly improve sleep quality in menopausal women, providing an effective non-pharmacological solution to manage sleep disturbances caused by hormonal changes. This approach offers a simple, practical, and low-risk intervention that can be easily implemented in daily routines. Future research should focus on optimizing the duration, frequency, and method of combining PMR and lavender aromatherapy for maximum effectiveness. Additionally, studies exploring the biological mechanisms underlying these effects and their long-term benefits in diverse populations would further strengthen the evidence base and guide broader implementation.

### Authors Contributions

The authors collaboratively contributed to the study by designing the research, conducting experiments, analyzing the data, and interpreting the findings. Their combined efforts emphasized the effectiveness of combining PMR and lavender aromatherapy in improving sleep quality by demonstrating how it aids in muscle relaxation, activates the body's relaxation system, and provides an easily applicable solution.

### Conflicts of Interest

In this research, there is no conflict of interest.

### Acknowledgment

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