



THE IMPACT OF LAVENDER AROMATHERAPY ON THE ENHANCEMENT OF SLEEP QUALITY IN POSTPARTUM MOTHERS

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Abstract

Introduction: The postpartum period signifies a transitional phase into parenthood, marked by the emergence of new roles and responsibilities, including alterations in sleep patterns and rest. Poor sleep quality in postpartum mothers can lead to various physical and psychological challenges. A potential preventive measure for this is the administration of lavender aromatherapy.

Objectives: This study aims to analyze the influence of lavender aromatherapy on improving the sleep quality of postpartum mothers.

Method: This is a quantitative analytical study using a quasi-experimental approach involving intervention and control groups. The population consists of postpartum mothers on days 3-7 in the Cikalong Public Health Center area. The intervention group receives lavender aromatherapy through a diffuser for 10 minutes daily for seven days, while the control group receives no intervention. Purposive sampling is used to select 19 participants in each group. The data are homogenous. Univariate analysis is conducted to determine respondent characteristics, while bivariate analysis is employed to investigate the impact of lavender aromatherapy on improving the sleep quality of postpartum mothers using an Independent Sample T-test.

Result: The findings reveal the mean score in the intervention group before aromatherapy (9.32) and in the control group (6.95). After aromatherapy, the mean score in the intervention group is (4.26) compared to the control group (8.21). Statistical analysis yields a p-value of 0.000 ($p < 0.05$), indicating a significant influence of lavender aromatherapy on improving the sleep quality of postpartum mothers.

Conclusion: There is a notable impact of lavender aromatherapy on enhancing the sleep quality of postpartum mothers.

Keywords: Sleep quality, postpartum, aromatherapy, lavender, maternal health

INTRODUCTION

Fundamentally, humans require rest and sleep as essential elements for life fulfillment. Sleep stands out as one of the most fundamental physiological needs for humans. According to Abraham Maslow in the book "Human Basic Needs" by Kasiati and Rosmalawati, physiological needs are absolute necessities that must be fulfilled by every individual to survive. These needs encompass oxygen and gas exchange, fluid intake (beverages), nutrition (food), elimination, rest and sleep, activity, body temperature balance, sexual needs, and the need for safety and protection (both physical and psychological).⁽¹⁾

A preliminary study involving six postpartum mothers within the 3-7 day timeframe revealed that all these mothers experienced sleep disturbances during the early postpartum phase. This was primarily due to frequent awakenings to care for the baby, including breastfeeding every 1-2 hours, changing diapers, and comforting the baby. Subsequently, mothers found it challenging to return to sleep and chose to complete household chores, fearing they would not have time once the baby woke up. Consequently, mothers reported feeling fatigued, unrefreshed upon waking, and having only a few hours of sleep.

The factors contributing to postpartum sleep disturbances include psychological stress, delayed sleep or early waking hours, adaptation to postpartum recovery (postpartum period), dual roles or new responsibilities in caring for the baby resulting in physical fatigue, breastfeeding during both day and night, bathing the baby, and consoling the baby at all hours. Additionally, other factors contributing to postpartum sleep disturbances include pain from perineal stitches, discomfort in the bladder, and environmental stimuli (disruption from the baby's cries)^{2,(3)}

The need for rest in postpartum mothers is a minimum of 8 hours per day. Failing to fulfill this requirement can have repercussions for both their physical and psychological health, as well as impacting their baby. Research indicates that the consequences of reduced sleep quality in postpartum mothers include postpartum fatigue, mood changes potentially leading to postpartum blues or depression, excessive anxiety, and a reduction in the quantity of breast milk produced within 24 hours⁽⁴⁾

One approach to address these challenges is through non-pharmacological interventions, such as providing lavender aromatherapy to postpartum mothers. Aromatherapy is a form of relaxation therapy that utilizes fragrances from plants or flowers. Lavender flowers contain linalool and linalyl, which possess sedative properties, inducing a calming and relaxing effect. The aroma is detected by olfactory nerve cilia, stimulating the hypothalamus and transmitting the information as scent. Subsequently, through the raphe nucleus, stimulation leads to serotonin release, regulating the initiation of sleep⁽³⁾. Lavender flower oil stands out due to its lower toxin content compared to oils from other plants.

METHODS

This study employs a quantitative analytical approach of a quasi-experimental nature through a non-equivalent control group design, involving both intervention and control groups. The research takes place in the homes of the respective respondents within the jurisdiction of Cikalong Public Health Center area, spanning a duration of one month (March to April 2023).

The study population consists of all postpartum mothers with normal deliveries within the catchment area of Cikalong Public Health Center. The research sample is comprised of postpartum mothers in the Cikalong Public Health Center area who meet specific inclusion and exclusion criteria. Inclusion criteria encompass a willingness to be part of the study, postpartum mothers on days 3-7 with normal delivery, and a lack of current use of medications or sleep therapy. Exclusion criteria involve allergies, particularly to lavender aroma, intolerance to lavender aromatherapy, postpartum mothers beyond 7 days, mental health issues, and postpartum complications or illnesses.

The sampling method for this research utilizes purposive sampling calculated through non-matched numerical analytical formulas according to Sopiudin Dahlan, resulting in a sample size of 20 individuals. However, midway through the research process, one participant could not complete the study (drop-out), leading to a final sample size of 19 individuals in each group.

In both groups, an evaluation of sleep quality is conducted before and after the intervention. In the control group, standard postpartum care is provided without any specific intervention. In the intervention group, lavender aromatherapy is administered through a

diffuser by adding 5-6 drops of lavender essential oil to 100 mL of water. The water in the diffuser transforms into vapor, which the respondent inhales from a distance of 1 meter for ≥ 10 minutes. This procedure is performed 20 minutes before bedtime for seven consecutive days.

The research instrument used is the translated PSQI questionnaire in Indonesian language, which has undergone validity and reliability testing with a result of 0.97. Data analysis employs the Independent sample T-test to investigate the impact of lavender aromatherapy on enhancing the sleep quality of postpartum mothers.

RESULTS AND DISCUSSION

Characteristics of Postpartum Mothers in Cikalong Public Health Center, Bandung Regency

Tabel 1.1 Table of postpartum characteristics

Characteristics of Respondents	Intervention		Control		Total	
	f	%	f	%	f	%
Age						
< 20 years old	1	5,3	1	5,3	2	5,3
20 – 35 years old	17	89,5	15	78,9	32	84,2
> 35 years old	1	5,3	3	15,8	4	10,5
Parity						
Primiparous	6	31,6	3	15,8	9	23,7
Multiparous	13	68,4	16	84,2	29	76,3
Occupation						
Working	0	0	1	5,3	1	2,6
Not working	19	100	18	94,7	37	97,4

Table 1.1 illustrates that among the 38 respondents, the majority fall within the age range of 20 – 35 years, comprising 32 individuals (84.2%). Age plays a pivotal role in an individual's physical and psychological maturity. During the postpartum period, age is intricately linked to an individual's physical and mental preparedness, especially in embracing new roles and responsibilities as a parent. This is in line with the theory that posits an increase in age correlates with enhanced strength and maturity in both thought processes and practical endeavours. A woman's age during pregnancy and childbirth is frequently associated with her mental readiness in fulfilling the role of a mother. Pregnancy at a younger age (< 20 years) or an advanced age (> 35 years) may pose biomedical risks for both the mother and the fetus. Younger pregnancies may result in immature thought processes and a lack of mental readiness for marital life(5)

In this study, the majority of respondents were multiparous mothers, totaling 29 individuals (76.3%). Multiparous mothers, who have experienced multiple pregnancies, tend to encounter sleep disturbances due to increased workload and the added responsibility of caring for existing children. This often leads to anxiety about their ability to care for their children and concerns about their future. This aligns with the theory that suggests multiparous mothers experience higher levels of anxiety compared to primiparous mothers. Previous experiences with pregnancy and childbirth, coupled with the presence of existing children, can amplify the burden on families. The addition of a new family member is perceived to increase familial responsibilities, and mothers may harbour worries about their ability to care for their children and concerns about their children's future.(6)

Terms of occupation, nearly all the participants in this study are either not employed or primarily focused on homemaking duties (97.4%). This aligns with the idea that those who are not in the workforce have more time available at home, especially for bonding with the baby and ensuring sufficient rest. This resonates with theories suggesting that individuals who are not engaged in formal employment often enjoy more time in a home setting compared to those juggling work responsibilities. (7) Another theory posits that a non-working mother can efficiently manage her responsibilities without the added pressure, allowing her to fully concentrate on postpartum care, particularly in caring for both herself and her baby. On the contrary, individuals who are employed may find themselves balancing work commitments, potentially impacting their ability to dedicate ample time to childcare.(8)

Sleep Quality Distribution Before Aromatherapy for Postpartum Mothers

Table 1.2 Table of postpartum mothers' sleep quality scores before being given aromatherapy.

Group	N	Mean	SD
Intervention	19	9,32	2,237
Control	19	6,95	2,345

Table 1.2 breaks down the sleep quality scores of postpartum mothers before the introduction of aromatherapy. The participants, divided into the intervention (n=19) and control (n=19) groups, revealed interesting insights. The mean score before aromatherapy for the intervention group stood at 9.32, with a standard deviation of 2.237. In contrast, the control group exhibited a mean of 6.95, accompanied by a standard deviation of 2.345.

The postpartum period symbolizes a significant shift into parenthood, marked by a multitude of changes—both physical and psychological, particularly during its initial stages. Consequently, postpartum mothers find themselves particularly susceptible to post-delivery stress. This aligns seamlessly with theories positing that almost every mother experiences stress during the early postpartum days. This period, spanning from the first to the tenth day after childbirth, is characterized by sleep difficulties, restlessness, forgetfulness, feelings of isolation, confusion, fatigue, and anxiety. Left unaddressed, these symptoms can escalate into postpartum blues or, in more severe cases, postpartum depression.(2) Therefore, the "taking hold" phase (3-7 days postpartum) becomes a critical juncture for effective communication, support, educational counseling, and interventions—essential elements in bolstering a mother's confidence in nurturing her child. Beyond that, it becomes imperative to attend to other maternal needs, including proper breastfeeding techniques, mobilization, adequate rest, postpartum exercises, personal hygiene, and elimination, among others.(6,9)

Upon examination of responses to the PSQI questionnaire, participants reported an average sleep duration of 7 hours per night before undergoing aromatherapy. However, within this timeframe, participants struggled to achieve restful sleep, often waking up at night to attend to breastfeeding and baby care duties. Corroborating these findings, Hapsari Windayanti et al.'s theory suggests that during the initial month of the postpartum period, mothers frequently contend with sleep disturbances due to the challenges of finding adequate sleep time and wrestling with feelings of depression. Other contributing factors to sleep disruptions in postpartum mothers include pre-existing sleep issues, primiparity (first-time motherhood), non-exclusive breastfeeding practices, and having a male infant. The recommended sleep duration for adults—approximately 2 hours during the day and 7-8 hours at night—remains elusive for many postpartum mothers(10). Insufficient nighttime rest may lead to reduced breast milk production, hampered involution processes, potential increases in postpartum bleeding, and a heightened risk of postpartum depression, hindering the ability to care for the baby(11)

In many instances, postpartum mothers encounter disrupted sleep patterns, grappling with breastfeeding challenges due to fatigue and diminished breast milk production. This confluence of factors often triggers anxiety in postpartum mothers, exerting an adverse impact on the lactation process by impeding the milk ejection reflex. In line with established theory, heightened stress and anxiety in postpartum mothers trigger a blockade in the let-down reflex. This sets off vasoconstriction upon the release of adrenaline, particularly epinephrine, in the alveolar blood vessels. Consequently, the production of oxytocin and prolactin hormones dwindles. Additionally, heightened anxiety prompts an increase in the secretion of Adrenocorticotrophic Hormone (ACTH) by the anterior pituitary gland, manifesting as cortisol. Elevated cortisol levels hinder the transportation of the oxytocin hormone, resulting in diminished breast milk output(12)

Sleep Quality Distribution After Aromatherapy for Postpartum Mothers

Table 1.3: Sleep Quality Scores of Postpartum Mothers After Aromatherapy

Group	N	Mean	SD
Intervention	19	4.26	1.881
Control	19	8.21	2.250

Table 1.3 reveals that among the 38 respondents, divided into 19 in the intervention group and 19 in the control group, the mean score for the intervention group is 4.26, while the control group shows a mean score of 8.21. The corresponding standard deviations are 1.881 and 2.250 for the intervention and control groups, respectively.

Frequency Distribution of Postpartum Mothers Sleep Quality Before and After Aromatherapy Intervention

In this bivariate analysis, the researcher employed the dependent sample T-test to assess the disparity in the average sleep quality scores of postpartum mothers before and after the intervention. The ensuing table encapsulates the frequency distribution:

Table 1.4: Sleep Quality Scores of Postpartum Mothers Before and After Aromatherapy

Group	N	Mean	SD	Sig.
Intervention	19	5.053	2.972	0.000
Control	19	1.263	2.579	0.047

*dependent sample t-test

The data in Table 1.4 reveals that among the 38 respondents, with 19 in the intervention group and 19 in the control group, the mean score for the intervention group is 5.053, whereas the control group exhibits a mean score of 1.263. The corresponding standard deviations are 2.972 and 2.579 for the intervention and control groups, respectively. The outcomes of the dependent sample t-test signify that the significance value for the intervention group is 0.000, and for the control group is 0.047. These findings indicate ($p < 0.05$), denoting a noteworthy distinction in the sleep quality scores of postpartum mothers between the pre-test and post-test data for each group.

Impact of Lavender Aromatherapy on Enhancing Postpartum Sleep Quality

Table 1.5: Influence of Lavender Aromatherapy on Postpartum Sleep Quality Improvement

Group	Mean	SD	P Value
Intervention	5.05	2.972	0.000
Control	2.11	1.524	

*Independent Sample T-Test

The outcomes in Table 1.5, derived from the Independent Sample T-Test, elucidate the mean sleep quality scores before and after the application of lavender aromatherapy. Notably, the intervention group exhibited a substantial elevation in sleep quality, with a mean of 5.05 and a standard deviation of 2.972. Conversely, the control group demonstrated a more modest increase, registering a mean of 2.11 and a standard deviation of 1.524. The statistical examination for the intervention group yielded a remarkable p-value of 0.000 ($p < 0.05$), underscoring the rejection of the null hypothesis and emphasizing a meaningful distinction in the sleep quality scores of postpartum mothers between the intervention and control groups. Consequently, the implementation of lavender aromatherapy yielded a noteworthy impact on augmenting the sleep quality of postpartum mothers in the Cikalong Public Health Center Working area.

For this study, a diffuser served as the medium of therapy, as inhaling essential oils directly through the nose is deemed more efficacious. This method was selected considering that diffusion allows for the immediate and direct inhalation of essential oils into the nasal and oral passages.(13)

Inhalation was opted for due to its expeditious, secure, and comfortable effects. Through inhalation, the constituents of lavender exert a direct influence on the hypothalamus within the brain, inducing a sedative impact on the nervous system, thereby facilitating the initiation of sleep. This concurs with the theory stipulating that, upon inhalation, aromatherapy instigates the evaporation of essential oils, which subsequently makes direct contact with cilia in the nasal mucosa. This interaction influences the hypothalamus and limbic system, resulting in a sedative influence on the nervous and endocrine systems. The particles are then transferred, prompting the generation of neurotransmitters such as dopamine and serotonin, thereby imparting a sedative, relaxing, and joyous effect.(13)

Lavender was chosen as the essential oil for its sedative properties, aligning with the theory positing that lavender flowers (*Lavandula angustifolia*) contain linalool (linoleic acid), which acts as a sedative. Upon inhaling lavender aromatherapy, the liberated aroma stimulates cilia receptors in the olfactory nerve, conveying the scent to the olfactory bulb via the olfactory nerve interconnected with the limbic system. The limbic system, pivotal for emotions and memory, includes the amygdala (emotional center) and hippocampus (memory, including lavender aroma). Through the hypothalamus, the aroma reaches the raphe nucleus in the small brain, culminating in the release of serotonin, a neurotransmitter vital for sleep regulation. (14)Another theory asserts that lavender flowers encompass linalool and linalyl, both possessing sedative traits that induce tranquility and relaxation. The perceived aroma stimulates olfactory nerve receptors, transmitting information to the brain, particularly via the hypothalamus to the raphe nucleus. Stimulation of the raphe nucleus triggers serotonin release, orchestrating the initiation of sleep.(3)

CONCLUSION

Upon conducting an extensive study on the administration of lavender aromatherapy to enhance the sleep quality of postpartum mothers in the Cikalong Public Health Center Subdistrict, Bandung Regency, involving 19 participants in the intervention group and 19 in

the control group, noteworthy findings have emerged. The average age of the respondents falls in the 20–35 age bracket, with the majority having experienced multiple childbirths and working as homemakers. The statistical analyses indicate significant disparities in sleep quality scores between the intervention and control groups both before and after the introduction of lavender aromatherapy. Thus, it can be confidently concluded that lavender aromatherapy exerts a substantial influence on improving the sleep quality of postpartum mothers, underscored by a highly significant p-value of 0.000 ($p < 0.05$).

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