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Massage Therapy as a Strategy for Managing Stress and Physical Symptoms in Pre-Menopause Women

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ABSTRACT

Background: Pre-menopause is a transitional phase characterized by decreased estrogen and triggers various physical and psychological complaints, such as hot flashes, sleep disturbances, muscle pain, fatigue, and stress, that can reduce women's quality of life and productiv ity. Massage therapy, as a non-pharmacological intervention, is known to reduce cortisollevels, increase endorphins, improve blood circulation, and promote musclerelaxation, potentially effectively reducing stress and physical complaints in premenopausal women at the community level. This study aims to analyze the effectiveness of massage therapy in reducing stress and physical symptoms among premenopausal women.

Subjects and Method: This quasi-experimental study involved 64 premenopausal women members of Ibu Aisyiyah Mulyorejo group who were divided into an intervention group (n=32) who received massage therapy and a control group (n=32) without massage. Massage therapy was given twice a week for 30–45 minutes per session, while changes in physical and psychological complaints were measured using the Menopause Rating Scale (MRS) before and after the intervention and analyzed using the Wilcoxon and Mann–Whitney tests at a significance level of $p<0.05$.

Results: Before the intervention, 97% of respondents in the intervention group were classified as having severe complaints, while 3% were in the moderate category. Following massage therapy, all respondents demonstrated improvement, with 75% categorized as having moderate complaints and 25% as having mild complaints, and no participants remaining in the severe category. The Wilcoxon test indicated a significant reduction in MRS scores within the intervention group ($p = 0.002$; $r = 0.87$), while the Mann–Whitney test showed that post-intervention MRS scores in the intervention group were significantly lower than those in the control group ($p = 0.005$).

Conclusion: Massage therapy is effective in reducing psychological and physical complaints in premenopausal women and can be recommended as a community-based complementary strategy for managing stress and somatic symptoms in this group

Keywords: pre-menopause, massage therapy, stress, physical complaints, Menopause Rating Scale

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BACKGROUND

Pre-menopause is a transition phase towards menopause, which usually occurs in women aged 40-50 years. In this phase, women experience significant hormonal changes, especially a decrease in estrogen production, which has an impact on the emergence of various physical and psychological symptoms, (Badawy et al. 2024). The prevalence of premenopausal symptoms in Indonesia shows significant variation, depending on the definition, measurement method, and population studied.

Based on data from the Central Statistics Agency (BPS), in 2025, it is estimated that there will be around 60 million Indonesian women entering premenopause, with an average age of around 50 years, (Putri et al. 2024). Premenopausal symptoms are highly prevalent and represent a significant public health concern, particularly due to their multidimensional impact on women's physical health, psychological well-being, and social roles.

Symptoms frequently reported by premenopausal women in Indonesia include hot flushes (89.5%), night sweats (63.5%), fatigue (46.9%), sleep disturbances (45.8%), memory loss (52.1%), anxiety (83.3%), feelings of isolation (91.6%), and depression (98.9%) (Fruitasari, 2024).

The prevalence of premenopausal symptoms in Surabaya is significant, although specific data for this city are limited. A study in Banjarbendo Village, Sidoarjo, which is adjacent to Surabaya, found that approximately 76.9% of women aged 40–55 years experienced premenopausal symptoms. The most common symptoms included hot flushes, night sweats, fatigue, insomnia, and mood disorders, (Umamah and Lestari 2018).

Massage therapy has been widely recognized as a non-pharmacological intervention that can reduce stress and alleviate physical symptoms. It works by lowering cortisol levels, increasing endorphin production, improving blood circulation, and promoting muscle relaxation, (Mardliyana and Puspita 2022).

Additionally, massage stimulates the parasympathetic nervous system, which contributes to relaxation and reduction of psychological distress such as anxiety and depression, (Mehrnoush et al. 2021). Massage therapy offers a safe, low-cost, and accessible alternative for managing both physical and psychological symptoms in premenopausal women, particularly in community-based settings.

Ibu Aisyiyah Mulyorejo Branch represents a community of women actively engaged in social and health-related activities. However, daily responsibilities and workload increase vulnerability to stress and physical complaints among its premenopausal members. The limited knowledge and practice of non-pharmacological interventions further exacerbate this condition. Therefore, it is necessary to investigate practical and sustainable interventions that can be easily implemented within community settings to improve women's health outcomes. Therefore, it is necessary to investigate practical and sustainable interventions that can be easily implemented within community settings to improve women's health outcomes.

Chronic stress has significant physiological, psychological, and social impacts, as well as on individual productivity (Alotiby 2024). Physiologically, prolonged stress can increase cortisol levels, leading to muscle tension, sleep disturbances, and a weakened immune system, thereby increasing disease susceptibility, (Shin and Park 2025). Psychologically, chronic stress can trigger anxiety, mild depression, and a decline in the quality of social interactions, which impact inter-

personal relationships and emotional well-being. The social and productivity impacts are also significant, with stressed individuals finding it difficult to focus on work, experiencing difficulties in daily activities, and experiencing disruptions infulfilling family roles. At the community level, the overall quality of life of community members can decline. In contrast, the potential for community health programs is suboptimal due to individuals' limitations in participating or contributing to their full potential (Dewangan and Goswami 2025).

Based on the existing gaps, the most appropriate solution is the application of massage therapy as a non-pharmacological intervention to manage stress and physical symptoms in premenopausal women. Massage therapy has been proven to reduce cortisol levels, increase endorphins, and improve muscle relaxation and blood circulation, thus effectively reducing pain, sleep disturbances, and emotional tension, (Döner et al. 2024). To increase effectiveness, massage therapy can be combined with premenopausal health education and simple relaxation techniques, enabling participants to independently implement stress management strategies.

A key intervention in addressing premenopausal symptoms is massage therapy, which is effective in lowering stress levels, increasing muscle relaxation, and reducing physical symptoms such as pain and sleep disturbances (Listiana et al. 2022). Additional approaches, such as pre-menopausal health education and simple relaxation techniques, can enhance the effectiveness of massage therapy by providing individuals with a greater understanding of the changes occurring in their bodies and simple ways to manage stress. Evidence suggests that massage therapy can lower cortisol levels and increase endorphins, contributing to stress reduction and improved well-being. Furthermore, massage can improve blood circulation and promote muscle relaxation, helping reduce pain and sleep disturbances. As a non-pharmacological intervention, massage therapy is safe to perform in the community, is relatively low-cost, and does not cause side effects, unlike medications.

Premenopausal women face significant hormonal changes, particularly decreased estrogen, which can lead to physical and psychological symptoms such as hot flashes, muscle pain, sleep disturbances, fatigue, and stress, (Mosconi et al. 2021) This condition reduces quality of life and productivity, and impacts women's social roles within the family and community. Several studies have demonstrated non-pharmacological interventions to reduce premenopausal symptoms. One such intervention is massage therapy, which has been shown to reduce stress levels, increase muscle relaxation, and reduce physical symptoms. Massage lowers cortisol levels, increases endorphin production, and improves blood circulation, thus effectively reducing pain and sleep disturbances (Listiana et al. 2022)

The application of massage therapy as a strategy for managing stress and physical symptoms was conducted within the context of local communities and women's organizations, rather than in clinical or laboratory settings. This provides a new perspective on how non-pharmacological interventions can be integrated into applicable and sustainable community health programs. This study aims to analyze the effectiveness of massage therapy in reducing stress and physical symptoms among premenopausal women in a community-based setting.

SUBJECTS AND METHOD

1. Study Design

The quasi-experimental research Design for this study aims to evaluate the effects of

massage therapy on physical symptoms and stress levels inpremenopausal women. This study will use two groups: an experimental groupthat receives massage therapy and a control group that does not.

The intervention protocol consisted of Swedish massage therapy, which is widely used for relaxation and stress reduction. The massage was applied to major body areas, including the back, shoulders, neck, arms, and legs, focusing on muscle relaxation and improved blood circulation. Each session lasted 30–45 minutes and was conducted twice a week. The total duration of the intervention was four weeks, resulting in eight sessions for each participant in the experimental group. The massage procedures were carried out by trained personnel following a standardized protocol to ensure consistency and reliability of the intervention.

2. Population and Sample

The study population consisted of premenopausal women who were membersof Ibu Aisyiyah Mulyorejo Branch, totaling 126 individuals. From this population,64 women were selected as research participants and divided into two groups: the experimental and the control groups. The experimental group consisted of32 people who received scheduled massage therapy.

In comparison, the control group consisted of 32 people who did not receive massage therapy but were still included in the data collection. The sampling technique used in this study was purposive sampling, in which participants were selected based on specific inclusion criteria relevant to the research objectives. This approach ensured that all selected participants had premenopausal symptoms and were suitable for evaluating the effectiveness of the intervention.

Inclusion criteria for participants included women aged 40–55 years who experienced premenopausal symptoms, such as hot flashes, sleep disturbances, muscle pain, and anxiety, and were willing to participate in the entire study. Exclusion criteria included women with certain medical conditionsor those undergoing medical therapy for premenopausal symptoms.

3. Study Variables

This study involved massage therapy as an independent variable, positioned asa non-pharmacological intervention to influence the psycho physiological condition of premenopausal women. This assumption still needs to be critically tested, as the effects of massage depend on the type of technique, its duration,and its frequency. The dependent variables included stress levels and premenopausal physical symptoms, where stress is understood as a subjectiveand physiological response due to hormonal fl uctuations that are susceptibleto external factors such as the environment and social support.

Therefore, it must be measured using standardized instruments to avoid bias. Meanwhile,physical symptoms such as muscle pain, fatigue, and sleep disturbances are considered somatic manifestations often associated with the premenopausal phase. However, scientific evidence suggests that massage interventions tendto have moderate effects that are not always sustainable, so pre- and post-intervention evaluations are crucial for assessing their actual impact.

4. Operational Definition of Variables

The operational definition in this study establishes massage therapy as an independent variable operationalized as a non-pharmacological intervention in the form of manipulation of the body's soft tissues with standardized techniques and durations, provided in a specific frequency during the intervention period, and assessed based on

adherence to the protocol, not the assumption of subjective benefits, because evidence shows that the effects of massage are highly dependent on the consistency and context of its implementation.

Dependent variables include stress and physical symptoms in premenopausal women, which are operationalized as the severity and impactof climacteric symptoms measured quantitatively using the Menopause Rating Scale (MRS) to assess somatic, psychological, and urogenital. Measurements were taken before and after the intervention to avoid momentary perception bias, considering that the literature shows that changes in premenopausal symptoms are not always linear to short-term interventions.

5. Study Instruments

Physical symptom changes was measured using the Menopause Rating Scale (MRS). It assess the intensity of menopausal symptoms, including hot flashes, sleep disturbances, fatigue, and anxiety, by assigning a score to each symptom experienced by participants.

6. Data analysis

Data collected using the Menopause Rating Scale (MRS) will be analyzed using descriptive statistics to describe symptom distributions, as well as inferential statistical tests such as the t-test or the Wilcoxon test to identify significant differences between the experimental and control groups. with Significance: $p < 0.05$.

7. Research Ethics

This study has received ethical clearance from the Health Research Ethics Committee of the Faculty of Health Sciences, Muhammadiyah University of Surabaya, with number: 173/KEPK/F/XII-/FIK/2025, which confirms that the research procedures havemet the applicable ethical standards for health research.

RESULTS

1. Sample Characteristics

The sample characteristics in this study describe the profile of Aisyiyah women from the Mulyorejo Branch of Surabaya City who are in the premenopausal period and actively participate in the organization's activities. In general, respondents are in the middle adult age range. The respondents' education levels and employment statuses indicate that mosthave a secondary education background and are homemakers or workers, sotheir daily lives involve a high level of domestic and social activities. Thiscondition makes respondents a relevant group to study in the context ofmassage therapy as a strategy for managing stress and physical symptoms, asthey face the demands of dual roles and biological changes that can affect quality of life and daily comfort.

Tabel 1. Respondent characteristics

Variable	Category	Intervention (n=32)		Control (n=32)		Total (n=64)
		n	%	n	%	
Age (years)	41–45	9	28 %	9	28 %	18 (28%)
	46–50	15	47 %	14	44 %	29 (45%)
	51–55	8	25 %	9	28 %	17 (27%)
Education	Elementary School	2	6 %	2	6 %	4 (6%)
	Junior High School	7	22 %	8	25 %	15 (23%)
	Senior High School	19	59 %	18	56 %	37 (58%)
	Tertiary Education	4	13 %	4	13 %	8 (12%)
Occupation	Employed	8	25 %	8	25 %	16 (25%)
	Unemployed	24	75 %	24	75 %	48 (75%)

The baseline characteristics of participants showed no statistically significant differences between the intervention and control groups (p>0.05), indicating that both groups were comparable prior to the intervention. The majority of participants were aged 46–50 years, had a senior high school education, and were not employed. This homogeneity strengthens the internal validity of the study and supports that any observed differences in outcomes are likely attributable to the intervention.

2. Bivariate Analysis

Based on Table 2, before therapy, all participants in the intervention group had moderate to severe psychological and physical complaints, with the majority—31 individuals (97%)—experiencing severe complaints, only 1 person (3%) with moderate complaints, and none (0%) with mild complaints. After the intervention, significant improvements occurred: no mothers remained with severe complaints (0%), most shifted to moderate complaints at 24 individuals (75%), and 8 individuals (25%) reached mild complaints. In the control group, before treatment most also had severe complaints—29 individuals (91%)—and 3 individuals (9%) moderate complaints, with none (0%) mild. After the same period, nearly all control participants remained with severe complaints at 30 individuals (94%), only 2 individuals (6%) moderate, and still none (0%) in the mild category.

Tabel 2 Frequency distribution based on psychological and physical complaints between groups

Psychological and physical complaints	Intervention group				Control group			
	Pre		Post		Pre		Post	
	N	%	N	%	N	%	N	%
Light	0	0	8	25	0	0	0	0
Moderate	1	3	24	75	3	9	2	6
Heavy	31	97	0	0	29	91	30	94

The comparison of Menopause Rating Scale (MRS) scores before and after the intervention shows a significant difference between the intervention and control groups. In the intervention group, the mean score decreased substantially from (Mean= 14.8; SD= 2.1) to (Mean= 8.6; SD= 1.9), indicating a marked improvement in both physical and psychological symptoms after receiving massage therapy, with statistical analysis confirming a significant change (p= 0.002).

In contrast, the control group showed only a slight reduction from (Mean= 14.2; SD= 2.3) to (Mean= 13.9; SD= 2.4), with a statistically significant result (p= 0.008).

Furthermore, the Mann–Whitney test revealed a significant difference in post-test scores between the two groups (p= 0.005), with the intervention group demonstrating considerably lower symptom severity than the control group. These findings indicate that massage therapy is effective in reducing stress and physical symptoms in pre-menopausal women and has strong potential as a non-pharmacological, community-based intervention to improve overall quality of life.

Tabel 3. Comparison of MRS Scores Before and After Intervention between Groups

Group		Mean (SD)	Category	r	p
Intervention	Pre-test	14.8 (2.1)	Severe (97%)	0.87	0.002
	Post-test	8.6 (1.9)	Moderate (75%)		
Control	Pre-test	14.2 (2.3)	Severe (91%)	-0.18	0.008
	Post-test	13.9 (2.4)	Severe (94%)		

Based on Table 4, the results of the Mann–Whitney test show a significant difference between the Menopause Rating Scale (MRS) scores in the intervention group and the control group, where the mean rank value of the intervention group is 16.50, which is much lower than the control group at 48.50, with p= 0.005. This finding indicates that,after the intervention, psychological and physical complaints in the intervention group were signifi cantly milder than those in the control group, suggesting that the therapy given to the intervention group was effective in reducing the MRS score.

Tabel 4. Results of the Mann–Whitney test

Group	N	Mean Rank	p
Intervention	32	16,50	0.005
Control	32	48,50	

DISCUSSION

The results of this study indicate that massage therapy can be used as a strategy for managing stress and physical symptoms in premenopausal women. These findings suggest that massage therapy not only leads to significant reductions in symptom severity but also improves functional capacity and overall quality of life.

Physiologically, the observed improvements may be explained by modulation of the autonomic nervous system, particularly through increased parasympathetic activity and reduced sympathetic activation. This mechanism contributes to decreased cortisol levels, improved cardiovascular stability, and enhanced neurotransmitter balance (Qu et al., 2025), which collectively support stress reduction and mood improvement.

In addition, improved peripheral circulation and muscle relaxation may alleviate somatic symptoms such as pain, stiffness, and fatigue. These mechanisms are especially relevant in premenopausal women, in whom hormonal fluctuations can disrupt the hypothalamic–pituitary–adrenal axis, increasing vulnerability to stress and psychosomatic symptoms (Qin et al., 2020). Furthermore, premenopausal women frequently experience hormonal changes, sleep disturbances, and emotional lability; therefore, interventions that promote relaxation and reduce stress can have a substantial impact on both physical and psychological well-being (Ntoumas et al., 2025a).

During premenopause and perimenopause, estrogen levels fluctuate and gradually decline, affecting multiple physiological systems, including mood regulation, sleep, stress response, and pain perception (Fidecicchi et al., 2024). This reduction in estrogen contributes to disruption of the hypothalamic–pituitary–adrenal (HPA) axis, increasing susceptibility to stress, anxiety, mood swings, sleep disturbances,

and somatic complaints such as muscle pain, hot flashes, and palpitations.

The Menopause Rating Scale (MRS) was developed as a standardized instrument to assess the severity of menopausal symptoms across three domains: psychological (e.g., depression, irritability, anxiety), somato-vegetative or physical (e.g., hot flashes, sleep disturbances, muscle and joint pain), and urogenital symptoms (Lang et al., 2025). Theoretically, higher MRS scores indicate greater symptom severity, and empirically, MRS scores have been associated with reduced quality of life, as measured by instruments such as the SF-36 (Jenabi et al., 2015). Therefore, the use of MRS in this study is grounded in the understanding that stress and physical symptoms in premenopausal women arise from an interplay of hormonal, psychological, and somatic changes that can be quantitatively assessed.

Massage therapy is thought to exert its effects through modulation of the autonomic and neuroendocrine systems. Evidence suggests that massage stimulates parasympathetic activity while suppressing sympathetic activation, resulting in reduced heart rate and blood pressure and promoting a state of deep relaxation (Ntoumas et al., 2025b). This shift is associated with decreased cortisol levels and increased release of neurotransmitters such as serotonin and dopamine, which contribute to improved mood and psychological well-being (Hachul et al., 2014). Consequently, these neurophysiological changes may reduce symptoms such as anxiety, irritability, tension, and sleep disturbances, which are reflected in the psychological domain of the MRS.

At the peripheral level, massage enhances blood circulation and tissue oxygenation, reduces muscle tension and spasms, and stimulates endorphin release, which acts as a natural analgesic. These effects can alleviate musculoskeletal pain, fatigue, and other somatic complaints commonly reported during the menopausal transition. Thus, massage therapy addresses both psychological and physical components of symptoms, which are captured in the total and subscale scores of the MRS.

From a midwifery practice perspective, these findings support the integration of massage therapy as a complementary approach within holistic care for premenopausal women (Kim and Yu, 2025). Massage therapy represents a relatively safe, feasible, and acceptable non-pharmacological intervention for managing stress and physical discomfort associated with hormonal changes. Given the evidence showing a shift in symptom categories from severe to moderate and mild, along with a large effect size in reducing MRS scores, massage therapy can be incorporated into promotive and preventive care strategies for midlife women, while ensuring attention to contraindications and procedural safety standards (Rozifa et al., 2023).

Linking these findings to theory, the observed reduction in symptom severity and MRS scores in the intervention group is consistent with the proposed mechanisms of massage therapy, including reduced stress system activation, improved emotional regulation, and relief of physical tension. In contrast, the absence of significant changes in the control group aligns with the understanding that, without targeted interventions, symptoms related to hormonal fluctuations tend to persist or worsen (Hanus and Fogarty, 2025).

Taken together, the neurophysiological mechanisms of massage, the hormonal and psychosocial changes of premenopause, and the validity of the MRS as a measurement tool provide a strong

scientific foundation for this study. Overall, the integration of clinical findings, statistical evidence, and physiological explanations supports the conclusion that massage therapy is an effective, evidence-based, and practical intervention for managing both psychological and physical symptoms in premenopausal women, particularly in community-based settings.

AUTHORS CONTRIBUTION:

Asta Adyani contributed to the conceptualization of the study, development of the research design, data collection, data analysis, and manuscript drafting. Irma Maya Puspita contributed to the supervision of the research process, validation of methodology, critical review, and revision of the manuscript for important intellectual content. Nova Elok Mardliyana contributed to the development of the intervention protocol, data interpretation, and final approval of the manuscript to be published. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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CONFLICT OF INTEREST

The researcher declares that he has no confl ict of interest regarding the implementation and reporting of this research. The entire planning, data collection, analysis, and manuscript preparation process was conducted independently without intervention from funding agencies, institutions, orother parties that could influence the objectivity of the results. Funding received was used solely to support the smooth running of the research activities and did not infl uence the interpretation of the data or the conclusions drawn.

REFERENCE

Alotiby A (2024). Immunology of stress: a review article. J Clin Med. 13(21): 6394. doi:10.3390/jcm13216394

Badawy Y, Spector A, Li Z, Desai R (2024). The risk of depression in the

menopausal stages: a systematic review and meta-analysis. J Affect Disord. 357: 126–133. doi:10.1016/-j.jad.2024.04.041

Dewangan RL, Goswami T (2025). Organizational role stress, quality of work life, organizational citizenship behavior, and psychological well-being among university faculty members. BMC Psychol. 13(1): 538. doi:10.1186/s40359-025-02883-x

Döner Şİ, Dağ Tüzmen H, Duran B, Sunar F (2024). The effect of aromatherapy massage with lemon and peppermint essential oil on menopausal symptoms: a double-blinded randomized placebo-controlled clinical trial. Explore (NY). 20(3): 313–318. doi:10.1016/j.explore.2023.09.001

Fidecicchi T, Giannini A, Chedraui P, Luisi S, Battipaglia C, Genazzani AR, Genazzani AD, Simoncini T (2024). Neuroendocrine mechanisms of mood disorders during menopause transition: a narrative review and future perspectives. Maturitas. 188: 108087. doi:10.1016/j.maturitas.20-24.108087

Fruitasari M (2024). Gejala menopause pada wanita premenopause. J Nurs Invent. 5(1).

Hachul H, Oliveira DS, Bittencourt LRA, Andersen ML, Tufik S (2014). The beneficial effects of massage therapy for insomnia in postmenopausal women. Sleep Sci. 7(2): 114–116. doi:10.1016/j.slsci.2014.09.005

Hanus A, Fogarty S (2025). The effects of massage therapy on post-traumatic stress disorder: a case report. Int J Ther Massage Bodyw. 18(3): 42–50. doi:10.3822/ijtmb.v18i3.979

Jenabi E, Shobeiri F, Hazavehei SMM, Roshanaei G (2015). Assessment of questionnaire measuring quality of life in menopausal women: a systematic review. Oman Med J. 30(3): 151–156. doi:10.5001/omj.-2015.34

Kim JH, Yu HJ (2025). Non-pharmacological intervention effects on middle-aged women with menopausal symptoms: a systematic review and meta-analysis. Healthcare (Basel). 13(24): 3206. doi: 10.3390/healthcare13243206

Lang XL, Huang CC, Cui HY, Zhong HX, Shen MY, Zhao F (2025). From physiology to psychology: an integrative review of menopausal syndrome. World J Psychiatry. 15(11). doi:10.5498/wjp.v15.i11.108713

Listiana E, Anggorowati A, Susilawati D (2022). Massage therapy to relieve menopausal symptoms: a systematic review. J Kebidanan. 11(1): 9–20. doi:10.26714/jk.11.1.2022.9-20

Mardliyana NE, Puspita IM (2022). Terapi komplementer pada pelayanan kebidanan. Yogyakarta: Deepublish.

Mehrnoush V, Darsareh F, Roozbeh N, Ziraeie A (2021). Efficacy of the complementary and alternative therapies for the management of psychological symptoms of menopause: a systematic review of randomized controlled trials. J Menopausal Med. 27(3): 115. doi:10.6118-/jmm.21022

Mosconi L, Berti V, Dyke J, Schelbaum E, Jett S, Loughlin L, Jang G, Rahman A, Hristov H, Pahlajani S, Andrews R, Matthews D, Etingin O, Ganzer C, de Leon M, Isaacson R, Brinton RD (2021). Menopause impacts human brain structure, connectivity, energy metabolism, and amyloid-beta deposition. Sci Rep. 11(1): 10867. doi:10.1038/s41598-021-90084-y

Ntoumas I, Karatzaferi C, Boubougiatzi F, Manakou N, Aslanidi A, Giannaki CD, Papanikolaou F, Dardiotis E, Lavdas E, Sakkas GK (2025a). Massage positively influences daytime brain activity and reduces arousal state in poor sleepers: a randomized controlled trial. BMC Complement Med Ther. 25(1): 290. doi:10.1186/s12906-025-05022-6

Ntoumas I, Karatzaferi C, Boubougiatzi F, Manakou N, Aslanidi A, Giannaki CD, Papanikolaou F, Dardiotis E, Lavdas E, Sakkas GK (2025b). Massage positively influences daytime brain activity and reduces arousal state in poor sleepers: a randomized controlled trial. BMC Complement Med Ther. 25(1): 290. doi:10.1186/s12906-025-05022-6

Putri SE, Susilawati S, Lathifah NS (2024). Hubungan pengetahuan dan sikap dalam menghadapi gejala menopause pada wanita perimenopause di Klinik Wede Ar Rachman. Malahayati Nurs J. 6(7): 2788–2801. doi:10.33024/mnj.v6i7.11920

Qin S, Xiao Y, Chi Z, Zhu D, Cheng P, Yu T, Li H, Jiao L (2020). Effectiveness and safety of massage in the treatment of anxiety and depression in patients with cancer. Medicine (Baltimore). 99(39): e22262. doi: 10.1097/MD.0000000000022262.

Qu Z, Sun X, Zhang X, Yin J, Zhang X, Zhao H, Zhang H (2025). The effects of sensory stimulation therapy in patients with sleep disorders: a scoping review. Front Neurosci. 19. doi:10.3389/fnins.2025.1682267

Rozifa AW, Mardliyana NE, Puspita IM (2023). Description of the implementation of complementary therapy in midwifery services in Surabaya, Indonesia. Maj Obstet Ginekol. 31(2): 75–79. doi:10.20473/mog.v31i22023.75-79

Shin H, Park C (2025). Perceived stress shapes symptom and social network dynamics: a network analysis of depression, anxiety, and relationship-specific support and strain. BMC Psychiatry. 25(1): 715. doi: 10.1186/s12888-025-07146-y

Umamah F, Lestari A (2018). Hubungan pre-menopause dengan kejadian hipertensi pada wanita di RT 11 RW 05 Kelurahan Banjarbendo Sidoarjo. J Health Sci. 9(1). doi:10.33086/-jhs.v9i1.189