



## Effectiveness of physical exercises and yoga on anxiety levels in menopausal women: a quasi-experimental study

*Efectividad de los ejercicios físicos y el yoga en los niveles de ansiedad en mujeres menopáusicas: un estudio cuasi-experimental*

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### Abstract

**Introduction:** Aging is a gradual process of natural change accompanied by a decline in physical, psychological, and social functions. Anxiety disorders are one of the declines in psychological functions. Physical exercise and yoga are non-pharmacological interventions that can affect anxiety.

**Objective:** This study aims to identify the effectiveness of physical exercise and yoga on anxiety levels in menopausal women.

**Methods:** A pre-post group design with control groups was employed in this quasi-experimental investigation. Purposive sampling was used to select the 138 samples used in this investigation. There were 69 respondents in the control group and 69 in the intervention group, making up the sample. Wilcoxon and Mann-Whitney tests were employed in data analysis. Within the intervention group, the study found a significant difference between the pre- and post-intervention phases ( $p$ -value  $<0.05$ ), suggesting notable changes after the use of yoga and physical activity.

**Result:** The level of anxiety in menopausal women in the treatment group was 3.06 times lighter than in the control group. Moreover, the level of anxiety in the treatment group decreased 2.03 times faster than in the control group.

**Conclusion:** Physical exercise and yoga are effective in reducing anxiety levels in menopausal women. The community is expected to continue having physical exercise and yoga as an effective effort to prevent anxiety in menopausal women and improve their quality of life.

### Keywords

Physical exercise; yoga; anxiety; menopausal; women.

### Resumen

**Introducción.** El envejecimiento es un proceso gradual de cambio natural acompañado por un deterioro de las funciones físicas, psicológicas y sociales. Los trastornos de ansiedad son una de las manifestaciones del deterioro de las funciones psicológicas. El ejercicio físico y el yoga son intervenciones no farmacológicas que pueden influir en la ansiedad.

**Objetivo.** Este estudio tiene como objetivo identificar la efectividad del ejercicio físico y el yoga sobre los niveles de ansiedad en mujeres menopáusicas.

**Métodos.** En esta investigación cuasi-experimental se empleó un diseño de grupo pre-post con grupos de control. Se utilizó un muestreo intencional para seleccionar las 138 muestras incluidas en este estudio. La muestra estuvo compuesta por 69 respondientes en el grupo de control y 69 en el grupo de intervención. Para el análisis de datos se emplearon las pruebas de Wilcoxon y Mann-Whitney. Dentro del grupo de intervención, el estudio encontró una diferencia significativa entre las fases pre y post-intervención ( $p$ -valor  $<0.05$ ), lo que sugiere cambios notables tras la implementación del yoga y la actividad física.

**Resultados.** El nivel de ansiedad en las mujeres menopáusicas del grupo de tratamiento fue 3.06 veces menor que en el grupo de control. Además, el nivel de ansiedad en el grupo de tratamiento disminuyó 2.03 veces más rápido que en el grupo de control.

**Conclusión.** El ejercicio físico y el yoga son efectivos para reducir los niveles de ansiedad en mujeres menopáusicas. Se espera que la comunidad continúe practicando ejercicio físico y yoga como un esfuerzo efectivo para prevenir la ansiedad en mujeres menopáusicas y mejorar su calidad de vida.

### Palabras clave

Ejercicio físico; yoga; ansiedad; menopausia; mujeres.

## Introduction

A woman's menopause is a normal stage of life, especially for those over the age of forty. This is the end of the menstrual cycle because the ovaries reduce the production of estrogen ( Khose, R., & , Bhore, V, 2023). Menopause is when periods stop due to a lack of ovarian follicular activity (Widjayanti, 2020). When women do not have their period for 12 consecutive months without any triggers such as pregnancy, medication, illness, or breastfeeding, then they have entered menopause (Aarshageetha et al., 2023). Usually, women start experiencing menopause at the age of 50 to 52 years (Heidari et al., 2019). Menopause affects over 50 million people globally at the moment. While women typically experience menopause between the ages of 49 and 52, the prevalence of menopause complaints in Asian women reaches 22-63% (Geriatricid, 2021). In Indonesia, menopausal women showed 7.4% of the population. With an average age of 49 years old at menopause, this percentage was predicted to rise to 11.54% in 2024 (Dwi, 2017 in Setiawan et al., 2020). Following the rise in the number of menopausal women, there are many different kinds and degrees of complex issues that might cause menopausal women to experience additional health issues.. Over 80% of women report having psychological and physical issues with a lot of pressure and a decrease in their quality of life. When the complaints are not immediately addressed, they can cause depression (Maya Fadlilah & Febby Akriana, 2023). The intensity of anxiety is relative, as individuals experiencing anxiety may regain emotional stability following adequate psychological or social support but some others are always anxious even though they always get support from people around them (Heidari et al., 2019).

Around 48.6% of women show symptoms of anxiety during menopause. One of the emotional symptoms that menopausal women suffer is anxiety (Agarwalet et al., 2019; Bremere et al., 2019). Some other studies revealed that the population of menopausal women is related to anxiety. Lusiana (2014) found that anxiety during menopause reached 53.8% while Yisma et al. (2017) reported a figure of 39.8%. Ulfah (2017) also showed that most menopausal women are in the low anxiety category and the duration of menopause correlates with the anxiety levels. Menopausal women often experience anxiety because they worry about things they have never worried about before. They worry when their reproductive period ends which means that their sexual and physical desires stop and organ function will decrease. This can reduce their honor as a woman. This condition will cause significant problems that may affect on woman's quality of life (Larasati, 2009 in Hanafi and Utamayasa, 2021). If such pressures are not addressed, it can cause stress leading to depression. Women should prioritize their health to improve life expectancy, happiness, and psychological well-being (Nurrasyidah, 2020). Mood symptoms in menopause can be managed by both pharmacotherapy and psychotherapy (Enomoto et al., 2021). Psychotropic medications are recommended and are a good choice for women who refuse hormone therapy (Sri Hayati & Tukimin, 2023). Besides, they function as a relief of vasomotor symptoms and sleep disturbances. Studies confirmed that short-term estrogen therapy is a treatment option for perimenopausal women with depressive symptoms (Rahime Sapak, 2025). However, the psychotropic role of estrogen and progesterone preparations in postmenopausal women is still unclear, and the safety of therapy needs to be considered (Rahime Sapak, 2025). Therefore, pharmacological approaches can be an alternative to manage mood symptoms (Elavsky & McAuley, 2009).

Non-pharmacological approaches such as yoga and physical exercise have proven beneficial for treating mood disorders during menopause (NCT05180266, 2021). The North American Menopause Society and the UK's Royal College of Obstetricians and Gynecologists advise women to consider physical exercise to treat vasomotor symptoms in menopause ( Khose, R., & , Bhore, V, 2023). Studies concerning menopausal women discovered that aerobic exercise can result in notable enhancements in a number of common symptoms associated with menopause such as mood, health-related quality of life, and insomnia. Previous clinical studies have reported decreased anxiety with physical exercise interventions (Chang & Babb, 2022; Murray et al., 2022). Regular activity during physical exercise can enhance mental, physical, and social relationships.. Physical exercise covers Tai Chi, dance, walking, running on a treadmill, and others. Another intervention in overcoming anxiety is yoga (Rahayu et al., 2023). Yoga has a direct effect on sympathetic and parasympathetic nerve activity, increasing Gamma Aminobutyric Acid (GABA) levels, and regulating the Hypothalamus-Pituitary Adrenal (HPA) to provide anxiolytic effects (McCall, 2013). Performing yoga 3 times a week effectively reduces anxiety scores in the elderly (Lubis & Wijayanti, 2020; Moghadam & Ganji, 2019; Park & Slattery, 2021). Physical exercise and yoga can compensate for decreased musculoskeletal system function. Physiologically, physical exercise and yoga



can increase range of motion, strengthen muscles, increase calcium levels throughout the body, enhance coordination, stop muscle loss, and enhance bodily functions. The elderly will feel healthier to engage in activities, which will enhance their quality of life. (Eviyanti et al., 2021). Physical exercise and yoga will activate the parasympathetic nerve fibers and the endorphin hormone which functions to get a happy effect and return the body to normal conditions with relaxation in muscles and a decrease in anxiety and stress levels (Lubis & Wijayanti, 2020). Getting this exercise once a day for 7 consecutive days is effective in reducing anxiety levels (Ekaputri & Rochmawati, 2016). This study aims to determine the effectiveness of physical exercise and yoga in reducing anxiety levels in menopausal women. Based on this objective, the research hypothesis can be formulated as follows: Physical exercises and yoga have a significant effect on reducing anxiety levels in menopausal women. Accordingly, the research question guiding this study is: Do physical exercises and yoga significantly reduce anxiety levels among menopausal women?

## Method

This quantitative study used a quasi-experimental method with a pre and post group design with experimental and control groups.

### *Participants*

The determination of the sample in this study used a purposive sampling technique. This study involved a sample size of 138 participants based on Slovin formula. The sample was grouped into the control and experimental groups consisting of 69 participants each. The inclusion criteria were women aged 48-60 years who live with their husbands, women who have stopped periods for at least 12 consecutive months, without degenerative diseases (Diabetes, hypertension), not have physical problems, and not have mental health problems. The exclusion criteria included women with a history of severe psychiatric disorders or those who had been regularly practicing yoga prior to the study.

### *Procedure*

Physical exercises in this study refer to structured and repetitive movements aimed at improving physical fitness, muscle strength, flexibility, and cardiovascular endurance. The exercises were designed to be moderate in intensity and suitable for menopausal women. They included a combination of aerobic exercises (such as brisk walking, light jogging, and rhythmic movements). Hatha Yoga, one of the most commonly practiced forms of yoga, emphasizes the integration of physical postures (asanas), breathing techniques (pranayama), and relaxation or meditation. This form of yoga is particularly beneficial for menopausal women because it promotes both physical flexibility and mental calmness. The Hatha Yoga sessions in this study included gentle postures such as Tadasana (Mountain Pose), Bhujangasana (Cobra Pose), Balasana (Child's Pose), and Shavasana (Corpse Pose), combined with slow and deep breathing exercises. Each session concluded with a short relaxation or mindfulness period aimed at reducing tension and promoting emotional balance. Physical exercise and yoga are carried out routinely 2 times a week for 4 weeks with a duration of 45 minutes per session. All intervention sessions, including both physical exercises and Hatha Yoga practices, were conducted under the supervision of qualified instructors and healthcare professionals.

### *Instrument*

This study used a Geriatric Anxiety Scale (GAS) to measure the condition before and after the intervention. The GAS consists of 30 items, each rated on a 4-point Likert scale, ranging from 0 ("not at all") to 3 ("all the time"). Respondents are asked to indicate how frequently they have experienced each symptom over the past week. The total score reflects the overall level of anxiety, with higher scores indicating greater anxiety severity. The total possible score ranges from 0 to 90, and the anxiety levels were classified as follows: 0-30: Light anxiety, 31-60: Moderate anxiety, 61-90: Severe anxiety. In this study, an observation sheet was employed as a systematic tool to monitor the implementation of both the physical exercise and Hatha Yoga interventions. The use of observation sheets ensured that each session was conducted according to standardized procedures and that participants' engagement, performance, and physical responses were recorded objectively throughout the intervention period.



## Data Analysis

The data was analyzed using version 22 of the Statistical Package for the Social Sciences (SPSS). The frequency and percentage distribution of the variables under study were displayed using univariate analysis. A non-normal distribution among continuous data was found in both the treatment and control groups when the Kolmogorov-Smirnov test was used to evaluate normality. Non-parametric testing was therefore carried out. As a result, the Mann-Whitney and Wilcoxon test was used to compare groups at a 95% significant level. The level of significance ( $\alpha$ ) was set at 0.05 ( $p < 0.05$ ). Results with p-values below 0.05 were considered statistically significant, indicating a meaningful reduction in anxiety levels due to the intervention

## Ethical Clearance

The Muhammadiyah University Gombong Health Research Ethics Commission granted ethical approval for the study. The ethical approval reference number is 286.6/II.3.AU/F/KEPK/X/2023. This guarantees that the rights and welfare of the participants are given adequate attention during the research process.

## Results

Table 1 shows the frequency distribution of respondents aged  $\geq 55$  years, namely 48 respondents (57.97%) 48 responders (69.57%) were in the control group and 48 in the intervention group. Most of the people that responded were not very educated. (Not attending school, Elementary school, and Junior High School), namely 41 respondents (59.42%) in the control group and 38 respondents (55.07%) in the intervention group. In terms of parity status, the majority of respondents were multipara, namely 42 respondents (60.87%) % in the intervention group and 39 respondents (56.52%) in the control group.

Table 1. Characteristics of Respondents (n=138)

Variable	Intervention Group		Control Group	
	n	%	n	%
Age				
48-55 years	29	42.03	21	30.43
$\geq 55$ years	40	57.97	48	69.57
Education				
Middle	31	44.93	28	40.58
Low (Not attending school, elementary school, and junior high school)	38	55.07	41	59.42
Parity Status				
Multipara	42	60.87	39	56.52
Primipara	27	39.13	30	43.48

Significant differences between before and after the intervention are displayed in Table 2. After engaging in yoga and physical exercise, the intervention group's p-value was less than 0.05, indicating a substantial change in the treatment group. However, the control group's p-value is more than 0.05, indicating that there was no discernible change following the intervention..

Table 2. Comparison of anxiety levels in the intervention and control groups before and after the intervention

Variable	Group	Z	p-Value
Anxiety level	Intervention	-3.185	0.016*
	Control	-3.091	0.112

Noted: Wilcoxon test was performed, \*Significant at p-value<0.05.

According to Table 3, participants in the physical exercise group demonstrated an OR of 3.06, suggesting that they were approximately three times more likely to experience a reduction in anxiety levels compared to the control group. Meanwhile, participants in the yoga group had an OR of 2.03, indicating they were about twice as likely to show decreased anxiety compared to the control group.



Table 3. Comparison of anxiety levels in the intervention and control groups after the intervention

Group	Anxiety Level (Post Test)						OR 1 CI (95%)	OR 2 CI (95%)
	Light		Moderate		Severe			
	N	%	n	%	n	%		
Intervention	49	71.01	12	17.40	8	11.59	3.06	2.03
Control	32	46.38	27	39.13	10	14.49	2.96 - 3.17	1.97 - 2.14

Noted: Mann-Whitney test was performed, CI=Confidence interval, R=reference

## Discussion

The results in Table 1 show that the majority of respondents were aged  $\geq 55$  years, with 48 respondents (57.97%) in the intervention group and 48 respondents (69.57%) in the control group. . This age is the beginning of menopause followed by physical changes and degenerative diseases. Such conditions are stressors that require effective coping. Poor adaptation can cause anxiety. Previous studies have proven that the age of  $>55$  years is a transition period from the reproductive period and the post-menopause period due to brain chemistry, and hormonal fluctuations in women. Women with hormonal influences are more susceptible to changes in feelings and are less able to maintain their emotional stability. Fear, tension, or anxiety caused by anticipation of possible danger is called anxiety. Usually, the source of anxiety is unknown or unpredictable (Huang et al., 2021). When anxiety interferes with achieving desired goals, work, social function, or social comfort, anxiety can be considered a pathology (Elavsky & McAuley, 2009). Anxiety experienced by menopausal women is caused by two factors, namely external and internal factors. External factors are threats to physical integrity and the self-system. Internal factors include age, stressors, gender, environment, and education (Sri Hayati & Tukimin, 2023). Physical exercise and yoga can help reduce anxiety in the elderly (Zhang & Zhao, 2023). The existing literature shows that physical exercise (gymnastics, walking, yoga, and breathing exercises) is proven to be effective in reducing anxiety in menopausal women (Wang et al., 2023). The results of the bivariate test showed that the intervention group had a decline of 2.03 times faster than the control group. Physical exercise for the elderly needs to consider the criteria of frequency, tension, time, and type (FITT) (Jayabharathi & Judie, 2014). How frequently an activity is performed or how many days of the week it is performed is known as its frequency. The three generally used criteria for intensity are low, medium, and high. Intensity is the degree of difficulty of an activity. Time describes how long an activity takes to complete in a single meeting.. Meanwhile, types refer to the type of exercise (Crowe & Van Puymbroeck, 2019). The physical activity is in the form of regular exercise, namely walking around the field 5 times. Hatta et al. (2013) revealed that physical exercise by walking can effectively reduce anxiety in the elderly . Walking at a comfortable pace is suitable for older adults and can be safely performed as part of physical activity programs (Hatta et al., 2013). The walking intervention was carried out for 25 minutes with moderate exercise intensity. Physical exercise has a positive effect on the immune system so it can be used as a strategy to strengthen the immune system. Besides, for elderly people, physical activity can also reduce weakness and fragility and improve coping mechanisms (Aissani et al., 2021). Sulsan (2014) argued that Exercise can help menopausal women with their issues and has been shown to considerably improve their quality of life ( $p = 0.02$ ). Menopausal women's quality of life is positively impacted by regular exercise. (Ibrahim et al., 2022). Yoga is an exercise consisting of three components: gentle stretching, breathing control exercises, and meditation as an intervention of the mind and body (Pavey, 2022). Yoga emphasizes the basics of exercise for body posture, deep breathing, and mind control techniques (Enomoto et al., 2021). The anxiety level of menopausal women decreased after the intervention of yoga because yoga can help calm the mind and relax the body as well as create positive energy in the body. Physically, yoga will create a feeling of comfort or relaxation. In a relaxed state, the body through the brain will produce endorphins which function as natural analgesics of the body and can relieve pain (Maya Fadlilah & Febby Akriana, 2023). Susan has proven that it is possible to solve the issues menopausal women face by practicing yoga. Regular exercise has a positive impact on their lives (Heidari et al., 2019). Physically, the relaxation induced by yoga practice generates a sense of comfort or ease. In a relaxed state, the body—through the brain—produces endorphins, which function as the body's natural analgesics and can relieve physical pain or discomfort (Rosida et al., 2017). A study by Susan (2014) additionally claimed that physical activity can help menopausal women with their issues and greatly enhance their quality of life ( $p = 0.02$ ). Premenopausal women's quality of life is positively impacted by regular exercise. (Susanti et al., 2022). This study is consistent with studies carried out by (Jorge et al.,

2016), which assessed the effectiveness of physical activity or Exercise for enhancing life quality because of menopausal symptoms. Each researcher reported that exercises carried out over a period of 3 and 2 months, respectively, were effective in reducing menopausal complaints. This study introduces a form of exercise that strengthens muscles, bones, and joints, which is useful for maintaining back muscle strength and bone density (Simangunsong et al., 2017). This exercise is expected to serve as an effort to protect the bones and muscles of menopausal women from the risk of osteoporosis, which results from the loss of estrogen hormones (Kowel et al., 2016). The type of exercise was adopted and modified by the researcher As a kind of physical exercise for the intervention used in this study (Anjasmara & Rachmiyani, 2020). Regular physical exercise and yoga influence the autonomic nerves and the central nervous system due to rhythmic and proportional stimulation of proprioceptors, visceroreceptors, and the vagus nerve (Ng et al., 2019). Balanced sympathetic and parasympathetic activity will provide a calm reaction or a calm mind as emotions and mental activity are also influenced by breathing patterns. elevated blood oxygen levels and improved oxygen use efficiency by the tissues will result in deeper relaxation (Nuraeni et al., 2019). Anxiety experienced by the elderly is assumed to be caused by adaptation to physical, psychological, and social changes due to aging. (Karmila et al., 2018) The intervention of physical exercise and yoga is effective and easy to do which increases the enthusiasm for practicing this activity and the results are effective in reducing anxiety scores in the elderly (Cut Rahmiati & Tjut Irma Zurijah, 2020).

This study has several limitations that should be acknowledged. First, the sample size was limited to participants from a single community, which restricts the generalizability of the findings. Second, the duration of the intervention was relatively short and did not allow for long-term assessment of anxiety reduction. Third, the intervention protocol lacked detailed documentation regarding the specific types of yoga postures and physical exercises performed, as well as supervision and adherence control. Future research should use a more standardized intervention protocol—such as specifying the type of yoga (e.g., Hatha yoga), exercise intensity, session duration, and instructor qualifications—to ensure replicability and validity. Additionally, potential confounding variables such as prior yoga experience, comorbidities, and psychological history were not fully controlled.

While the findings of this study demonstrate that both physical exercise and yoga effectively reduce anxiety levels in menopausal women, the applicability of these results to other populations should be considered with caution. For instance, women with comorbid conditions such as cardiovascular disease, diabetes, or musculoskeletal disorders may experience different physiological responses to exercise or yoga. Their physical limitations or medication use could influence the extent to which these interventions reduce anxiety, requiring modifications in exercise intensity, duration, or type of movement. Therefore, future research should explore adaptive exercise or yoga programs tailored to women with specific health conditions to ensure safety and effectiveness.

Moreover, cultural factors may also shape the acceptability and impact of these interventions. In some cultures, yoga and physical exercise are more widely practiced and socially supported, while in others, participation may be limited by religious norms, gender expectations, or access to facilities. The psychological meaning attributed to yoga—whether as a spiritual, therapeutic, or fitness activity—can further affect motivation and adherence. Consequently, applying these findings in different cultural settings would require contextual adjustments, including culturally sensitive program designs and community-based education to enhance participation.

Overall, although the interventions proved effective in this study, their generalizability should be tested in diverse populations and cultural environments to confirm their broader relevance and ensure that anxiety reduction strategies are inclusive, safe, and adaptable to varying health and social conditions.

The study provides practical insights into non-pharmacological strategies for managing anxiety in menopausal women. Yoga and moderate physical activity can be incorporated into community-based health promotion programs, particularly for women reluctant to use hormone therapy or psychotropic medication. Future studies are recommended to include a larger and more diverse sample, apply a longer intervention period, and employ complementary analyses such as logistic regression or ANCOVA to examine the influence of demographic variables on intervention outcomes.

Finally, the findings should be interpreted with caution when applied to populations with comorbid conditions or different cultural backgrounds. A critical reflection on contextual adaptability will



strengthen the practical relevance of yoga and physical exercises as accessible, low-cost interventions for women's mental health during menopause.

## Conclusions

Based on the results of the analysis and discussion, it can be concluded that physical exercise and yoga can help reduce anxiety levels in menopausal women. The community is expected to continue to carry out physical exercise and yoga as an effective effort to prevent anxiety in menopause which can affect the quality of life. Future studies are expected to use more specific measuring instruments and focus on a wider research location with a diverse sample to obtain comprehensive results.

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