



THE EFFECTIVENESS OF TAI CHI EXERCISE IN REDUCING DEPRESSION LEVELS IN ADULTS

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ABSTRACT

Depression is a mental health disorder that is more commonly experienced in adulthood. At this stage, individuals begin to experience various changes, both physically and in terms of their social roles, interpersonal relationships, and lifestyle patterns. These changes can affect emotional balance and increase the risk of depression. One non-pharmacological intervention that can help overcome depression is Tai Chi. This study aims to analyze the effectiveness of Tai Chi on depression levels in adults in the community. This study used a quantitative approach with a quasi-experimental design in the form of a one-group pretest-posttest design without a control. The sample consisted of 30 respondents selected using accidental sampling and meeting the inclusion criteria of being aged 18–59 years with mild to moderate depression. The instrument used was the PHQ-9 questionnaire with a validity score of 0.508–0.907. The intervention consisted of Tai Chi exercises comprising eight movements, performed three times a week for 30 minutes independently at home. The data were analyzed using the Wilcoxon test to see if there was a difference in depression levels before and after the intervention. Before the intervention, the majority of respondents experienced mild depression, while after the intervention, the majority of respondents showed no symptoms of depression. The Wilcoxon test showed a Z value of -4.899 with $p = 0.001$. Tai Chi exercises have a significant effect in reducing depression levels in adults in the community. Tai Chi exercises can be used as an alternative non-pharmacological intervention to improve the mental health of adults in the community.

Keywords: adults; depression levels; mental health; tai chi exercise

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INTRODUCTION

Depression in adulthood is a complex and multifactorial mental health problem. This condition can be caused by various factors, such as social and psychological factors, as well as negative life experiences, such as the loss of a loved one, unemployment, and traumatic events (Pilar Matud et al., 2020). Depression is characterized by intense and prolonged mood swings, including persistent feelings of sadness, loss of interest or pleasure in daily activities, sleep disturbances, and decreased concentration and productivity (Robertus Surjoseto, 2022). The long-term effects of depression can be extensive, ranging from low self-esteem, feelings of sadness and helplessness, feelings of uselessness, to feelings of despair and the desire to end one's life (Robertus Surjoseto, 2022). The risk of depression is higher in people aged 60 and below than in those aged 60 and above. This is because in adulthood, individuals begin to face significant life changes, which then affect their mindset, behavior, attitudes, and decision-making in daily life (Fadli et al., 2023).

Based on data from the World Health Organization (2023), it is recorded that around 280 million people worldwide, or around 5% of the adult population, experience depression. In Southeast Asia, this figure is also significant, with approximately 27% of the adult population experiencing symptoms of depression. Data from Indonesia through the Basic Health Research (Riskesdas, 2018) shows a prevalence of depression of 9.8%, and for those aged 15 years and above, it reaches 6.1%. This figure shows that depression occurs more frequently in the productive age group. Meanwhile, data from the Indonesian Psychiatric Association (PDSKJI) has examined 14,988 people since

2020-2022. The data obtained shows that in 2020, 69.3% of respondents experienced depression, increasing to 77.2% in 2021, with similar cases continuing to be found in 2022. The age group most affected by depression is 20–30 years old, followed by those under 20 years old, and then 31–40 years old. This data shows that the incidence of depression is more prevalent among people of productive age (Evan Wijaya et al., 2023). A report from the Indonesian Ministry of Health (Kemenkes RI) also states that cases of mental health problems increased from 197,000 cases in 2019 to 277,000 cases in 2021. In Sukoharjo Regency alone, around 15–30% of adults experience mild to moderate symptoms of depression.

According to the WHO, adulthood is divided into two stages, namely early adulthood (18–39 years) and middle adulthood (40–59 years). Early adulthood is often referred to as a transition period from adolescence to adulthood. At this stage, individuals begin to adjust to new patterns of life, face social expectations, gain independence, and take on personal responsibility for their needs (Fadli et al., 2023). Meanwhile, middle adulthood is defined as the middle period before entering old age. Middle adulthood is a phase when individuals have reached maturity but also begin to face pressures such as work, dual roles in the family, declining physical condition, emotional instability, and hormonal changes that can cause mental fatigue and a loss of meaning in life (Ferdiansyah & Masfufah, 2022). Psychologically, the burden of economic responsibility and family stability reinforces stressors that trigger emotional disorders (Nurhazlina Mohd. Ariffin, 2021). The problems and changes experienced in early and middle adulthood often cause individuals to experience anxiety and stress, which, if not handled properly, can develop into depression (Pilar Matud et al., 2020).

In general, depression can be managed through two main approaches, namely pharmacological and non-pharmacological treatment. Organizations such as The American Heart Association, The American College of Sports Medicine, and The Surgeon General of the United States state that physical activity or exercise is an important part of non-pharmacological therapy for individuals experiencing depression, especially those of productive age. One form of non-pharmacological therapy that is gaining attention is traditional physical-mental exercises such as Tai Chi. Tai Chi is a physical and mental exercise originating in China, which combines slow movements, deep breathing, and meditative focus to balance the body and mind. This exercise can increase relaxation and reduce stress hormone levels such as cortisol when done regularly for 15–30 minutes per session (Kresnayana et al., 2021). In addition, Tai Chi exercises can also improve sleep quality, reduce anxiety, and increase life satisfaction, which are very important in maintaining balance in adulthood (Wu et al., 2023).

Previous studies have focused more on the effects of Tai Chi on emotional well-being and quality of life in older adults with depression. However, research on the effectiveness of Tai Chi exercises on depression levels in adulthood, especially in Indonesia, is still limited. Therefore, this study aims to identify the effect of Tai Chi exercises on reducing depression levels in adults.

METHOD

This study used a quantitative approach with a quasi-experimental design in the form of a one-group pretest-posttest design without control. This study was conducted at three health posts in Purbayan Village, Baki District, Sukoharjo Regency, from July to September 2025. The population in this study was 4,418 people. The sampling technique used was accidental sampling with inclusion criteria, namely aged 18–59 years and experiencing mild to moderate depression. Based on these criteria, 30 adult respondents who met the research requirements were obtained. Depression symptoms were measured using the Patient Health Questionnaire-9 (PHQ-9), a validated questionnaire in the Indonesian language. The instrument was proven to be valid and reliable with a minimum validity value of 0.508 and a maximum of 0.907, as well as a reliability value (Cronbach's alpha) of 0.936 (Khumaidi et al., 2023). This questionnaire consists of nine

questions with a total score of 0–27 and is categorized as follows: 0–4 (no symptoms), 5–9 (mild), 10–14 (moderate), 15–19 (severe), 20–27 (very severe). The intervention consisted of Tai Chi exercises comprising eight movements, performed three times a week for 12 weeks, with each session lasting 30 minutes. The exercises were performed independently at each respondent's home and monitored using a checklist to ensure compliance with the intervention. The research data were analyzed using univariate and bivariate tests. The Wilcoxon Signed Rank Test was used to determine the difference in depression levels before and after the intervention in 30 respondents. This study has obtained ethical approval from the Health Research Ethics Committee of the Faculty of Medicine, Muhammadiyah University Surakarta (KEPK-FK UMS) with letter number 5894/B.1/KEPK-FKUMS/IX/2025.

RESULT

The characteristics of the respondents in this study included gender, age group, and occupation. Based on Table 1, the distribution of respondent characteristics based on gender shows that the majority of respondents were female, numbering 27 people (90%). Based on the distribution of respondent characteristics by age group, the majority of respondents were in the middle-aged category (40–59 years), with 21 people (70%). Based on Table 3, the distribution of respondent characteristics by occupation shows that the majority of respondents were housewives, with 22 people (73.3%).

Table 1.
Distribution of Respondent Characteristics Based on Gender

Gender	f	%
Female	27	90
Male	3	10

Table 2.
Distribution of Respondent Characteristics Based on Age Group

Characteristic	f	%
Early Adulthood (18-39)	9	30
Middle-aged (40-59)	21	70

Table 3.
Distribution of Respondent Characteristics Based on Occupation

Characteristic	f	%
Housewife	22	73,3
Laborer	3	10
Entrepreneur	3	10
Village official	1	3,3
Retired	1	3,3

Table 4.
Distribution of Respondent Characteristics Based on Educational Background

Characteristic	f	%
No schooling	2	6,7
Elementary school	5	16,7
Junior high school	2	6,7
Senior high school	16	53,3
College	5	16,7

Table 5.
Depression Levels Before (Pre-test) and After (Post-test) Tai Chi Exercise Intervention

Component	N(47)	%
Pre Test		
Mild	24	80
Moderate	6	20
Post Test		
No Symptoms	24	80
Mild	6	20

The level of depression experienced by respondents in this study, based on Table 4, shows that at the pretest stage, 24 respondents (80%) were in the mild depression category. After the intervention, 24 respondents (80%) showed no symptoms of depression.

Table 6.
Effect of Depression Levels in Adults Before and After Tai Chi Exercise Intervention

Variable	N	Z	Asymp. Sig(2-tailed)
Pretest-Posttest	30	-5.477	0.001

Table 5 shows that $p = 0.001$. This indicates that there is a significant difference between the depression levels of respondents before (pretest) and after (posttest) the Tai Chi exercise intervention.

DISCUSSION

Respondent Characteristics Based on Gender

Based on Table 1, the results show that the majority of respondents were female, totaling 27 people. Epidemiologically, the prevalence of depression is indeed higher in women than in men. This finding is in line with research by Evan Wijaya et al (2023), which states that women are more at risk of depression than men. This is due to various factors, including biological factors, dual roles, and socioeconomic factors. Biologically, fluctuations in estrogen and progesterone hormones during the reproductive period can affect brain chemicals such as serotonin and dopamine, which play a role in regulating mood. This hormonal imbalance makes women more prone to mood swings, anxiety, feelings of sadness, and loss of enthusiasm (Kundakovic & Rocks, 2022). In addition, adult women who have dual roles in the family and at work will experience increased emotional stress and mental fatigue (Kraemer et al., 2021).

Respondent Characteristics Based on Age

Table 2 shows that most respondents were aged 40-59 (middle-aged). This finding is in line with research by Brody & Hughes (2021), which reports that depression is more common in middle-aged adults than in young adults. Work pressure, family responsibilities, declining physical condition, and economic pressure are the dominant factors causing stress in this age group. However, research Nurhazlina Mohd. Ariffin (2021) shows the opposite, that the early adult group (18–29 years) has a three times greater risk of depression because they are experiencing a period of life transition, changes in self-identity, and social adjustment. This period is full of uncertainty and new demands that can trigger anxiety and stress.

Respondent Characteristics Based on Occupation

Table 3 shows that the majority of respondents were housewives (22 people). Symptoms of depression are more commonly experienced by housewives due to social isolation, role burdens, and economic pressures, especially in rural areas with limited access to mental health services. Therefore, the high rate of depression in this group can be attributed to cumulative psychosocial stress (Fahriani et al., 2024). This finding is reinforced by the dominance of housewives in the research sample, so that the findings depend on the dominant characteristics of the research sample.

Respondent Characteristics Based on Educational Background

Table 4, the results show that most respondents had a high school education (16 people). Educational level affects the ability to understand Tai Chi exercise instructions, so compliance with the intervention was relatively good. This finding is in line with 2024 BPS data, which states that the majority of Indonesians aged 15 years and above have a high school/vocational school education (30.85%). However, education level is not always the determining factor in whether an individual experiences depression or not. Other factors also influence this, such as the environment and each individual's coping skills. Individuals with poor coping skills are at risk of experiencing mild depression. (Xiong et al., 2024)

Depression Levels Before the Tai Chi Exercise Intervention

Based on Table 5, the pretest results using the PHQ-9 questionnaire showed that the majority of respondents experienced mild depression. These findings are consistent with the study by Wang et al. (2020), which found that the majority of respondents were middle-aged adults ($n = 17,663$) and that the prevalence of moderate to severe depression in this group was 68.3%. Factors that influence this include low education, unstable marital status, economic uncertainty, and lack of social support. Most respondents were in a stressful phase of life, whether at work, in their families, or in their social circumstances, making them prone to mild depression symptoms.

Depression Levels After Tai Chi Intervention

Based on Table 5, the posttest results show that the majority of respondents experienced no symptoms of depression, indicating a significant change in depression levels. This change demonstrates the effectiveness of Tai Chi in reducing symptoms of depression. Physiologically, the slow movements and deep breathing in Tai Chi can lower cortisol levels and increase endorphins, dopamine, and serotonin, which play a role in improving mood (Wu et al., 2023). Psychologically, this exercise cultivates mindfulness and relaxation, which help reduce emotional stress (Kresnayana et al., 2021).

The Effect of Tai Chi Exercise on Depression Levels

Based on Table 6, the results of the Wilcoxon Signed Rank Test statistical test show a value of $Z = -5.477$ with $p = 0.001$, which means that there is a significant effect between Tai Chi exercise and a decrease in depression levels. These results are consistent with various meta-analysis studies showing that Tai Chi is effective in reducing depression scores in adult populations through improved emotional regulation, reduced physiological stress, and increased self-efficacy (Wu et al., 2023; Fadli et al., 2023). The effectiveness of this intervention is also influenced by the characteristics of the respondents, namely the majority of women (90%), middle-aged adults (40–59 years), and housewives (73.3%), who are groups with a higher risk of depression due to dual roles and emotional instability (Ferdiansyah & Masfufah, 2022). Physiologically, Tai Chi reduces the activity of the Hypothalamic–Pituitary–Adrenal (HPA) axis, thereby decreasing cortisol levels and reducing biological stress (Zeng et al., 2023). Psychologically, this exercise strengthens self-control and reduces negative thoughts through slow movements and deep breathing performed regularly. Although the one-group pretest–posttest design without a control group has limitations because it cannot eliminate external factors, these results still reinforce the biopsychosocial concept in mental health. The balance between body, mind, and social environment is an important factor in emotional recovery. Thus, Tai Chi exercise can be recommended as a simple, affordable, and effective non-pharmacological therapy for reducing depression levels in the productive age population. Integrating Tai Chi into public health programs can help improve mental well-being, particularly in rural areas with limited access to mental health services.

CONCLUSION

The results showed that Tai Chi exercise had a significant effect on reducing depression levels in adults. This was evidenced by the pretest results, which showed that most respondents experienced mild depression, while after the intervention (posttest), the majority no longer showed symptoms of depression. This exercise proved effective because it was able to improve emotional regulation, reduce physiological stress, and strengthen self-confidence. Its effectiveness was also influenced by the characteristics of the respondents, who were mostly middle-aged adult women and housewives, a group that is vulnerable to depression due to their dual roles and emotional pressures. Physiologically, Tai Chi helps reduce the activity of the body's stress system and cortisol levels, while psychologically it increases self-control and reduces negative thoughts through gentle movements and deep breathing performed regularly. Thus, Tai Chi exercises can be recommended as a cheap, easy, and effective non-pharmacological intervention to reduce depression and improve

the mental well-being of the community, especially in areas with limited access to mental health services.

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