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Utilisation of Agricultural Activities as a New Strategy to Overcome Frailty Symptoms in Menopausal Women in Rural Areas

Rahmi Fitria✉[1)], Eka Yuli Handayani[1)], Sri Wulandari[1)], Nana Aldriana[1)]

[1] Midwifery, Faculty of Health Science, University of Pasir Pengaraian, Rokan Hulu, Riau Indonesia 28457

✉Email: rahmifitriakom@gmail.com

ABSTRACT

***Background**: Menopause, occurring between ages 45 and 55, often brings physical and mental health challenges, with frailty being a major concern. Frailty causes decreased muscle strength, poor balance, and increased susceptibility to chronic diseases. Despite its significance, research on nature-based interventions, such as agricultural activities, to alleviate frailty symptoms in menopausal women, especially in rural areas, is limited. **Objective**: This study aims to evaluate the effectiveness of agricultural activities in reducing frailty symptoms among menopausal women in Rambah District, while also assessing their impact on physical and mental well-being. **Methods**: An experimental design with a pre-test and post-test approach was used. Sixty menopausal women from Rambah District were randomly divided into an experimental group (agricultural program) and a control group. Frailty symptoms were measured using the Fried Frailty Criteria, and mental health was assessed with the Beck Depression Scale and Hamilton Anxiety Scale. Data analysis included normality tests, homogeneity tests, and independent samples t-tests. **Results**: The experimental group showed a significant improvement in frailty symptoms, with the average score increasing from 15.22 to 76.11. In contrast, the control group showed modest improvements. Statistical analysis confirmed data normality and equal variances between groups. The research time is between the first week and the second week in May 2024. **Conclusion**: This study demonstrates that agricultural activities are an effective, accessible intervention for reducing frailty symptoms in menopausal women, particularly in rural areas. It suggests that community-based programs using local resources like farming can significantly improve both the physical and mental health of menopausal women, offering a sustainable solution for health promotion in rural communities.*

***Keywords**: Frailty, Menopause women, Mental health, Physical health*

INTRODUCTION

Menopause is a natural phase that every woman experiences, marking the end of her reproductive years, typically occurring between the ages of 45 and 55. During this phase, hormonal changes often have a significant impact on a woman's physical and mental health. One of the biggest challenges faced by menopausal women is frailty, which can lead to decreased muscle strength, poor body balance, and reduced physical endurance, making them more susceptible to chronic diseases. Beyond being a physical issue, frailty also affects a woman's quality of life, happiness, and life expectancy. Therefore, finding effective ways to reduce these frailty symptoms is crucial so that menopausal women can continue to live a better quality of life.

One approach gaining attention is nature-based activities, such as farming, as a solution to combat frailty symptoms. Several studies have shown that outdoor physical activities, like gardening or working on farmland, can significantly benefit both physical and mental health. These activities help improve physical fitness, reduce stress, improve mood, and strengthen muscles and body balance. Therefore, agricultural activities can be an effective way to reduce frailty symptoms often experienced by menopausal women. However, while the benefits of physical activity are widely known, there is a research gap specifically focused on the role of agriculture in helping menopausal women reduce frailty symptoms, especially in rural areas like Rambah District. Previous studies have predominantly focused on light exercises such as walking or yoga, with limited

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attention given to nature-based activities, particularly farming, for menopausal women. For instance, a study by Mikkelsen (2020) explored the benefits of gardening on the health of older adults but did not specifically address its impact on menopausal women.

The urgency of this research is particularly relevant, given the increasing number of menopausal women living in rural areas, who often have limited access to healthcare services and medical facilities. In areas like Rambah District, where farming is a part of daily life, nature-based activities such as gardening can serve as an affordable and accessible solution to help alleviate frailty symptoms. This study aims to explore how agricultural activities can play a key role in reducing frailty symptoms in menopausal women in Rambah District. It is hoped that the findings will contribute to the development of new community-based methods that can enhance both the physical and mental well-being of menopausal women, while also opening opportunities for more inclusive and sustainable health programs.

METHODS

This study uses an experimental method to test the effectiveness of agricultural activities (lettuce gardening) in reducing frailty symptoms in menopausal women in Rambah District (Beck and Brewis, 2024). The experimental method was chosen because it allows researchers to control variables and directly measure the impact of interventions on frailty symptoms. By using an experimental design, this study can identify a causal relationship between agricultural activities and improvements in frailty conditions in menopausal women. This study received ethical approval from the Independent Ethics Committee (IEC) as the number was withdrawn, number: 004/UE-FIK-UPP/II/2025.

Research Design

This study used a pre-test and post-test design with a control group. In this design, participants will be divided into two groups: an experimental group that will follow the agricultural program and a control group that will not follow the program but will still be monitored for changes that may occur during the study period (Sauer, 2023a). This design allows for comparison between the group given the intervention (agriculture) and the group not given the intervention to measure the program's real impact on frailty symptoms.

Table 1. Baseline test and Final evaluation Control Group Design

Group	Baseline test	Intervention	Final evaluation
Exploratory group	T1e	X	T2e
Control Group	T1c	X	T2c

Population and Sample

The population in this study were menopausal women living in Rambah District. Samples were taken randomly from the local community with the following inclusion criteria:

- Women aged 45-60 years
- Have experienced menopause
- Have symptoms of frailty identified based on the Fried Frailty Criteria
- Do not have chronic diseases that can significantly affect physical abilities.

Measurement Instruments

Frailty symptoms will be measured using the Fried Frailty Criteria, which includes four main indicators:

- Unintentional weight loss
- Weak muscle strength
- Fatigue or physical exhaustion
- Limited physical activity
- Balance problems.

The total sample to be taken is 60 women, who will then be randomly divided into two groups: 30 people in the experimental group and 30 people in the control group (Min *et al.*, 2022). Measurements will be taken before *(pre-test)* and after *(post-test*) the agricultural program takes place. In addition, researchers will also measure participants' mental health and well-being using instruments such as the Beck Depression Scale and the Hamilton Anxiety Scale to assess whether there are psychological changes after participating in the program.

Time and Duration

The research time is between the first week and the second week in May 2024 with an intervention duration for the experimental group of 7 days, which is

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guided directly by researchers and the team.

Ethics

In this study, ethical principles were upheld by ensuring the protection of participants' rights and well-being. Before participating, all participants were fully informed about the purpose, procedures, potential benefits, and risks of the study and they provided voluntary consent. Participants' data were kept confidential through anonymisation, with access restricted to authorised researchers only. Physical and psychological risks were minimized through close monitoring during the program, and medical or psychological support was provided if necessary. Participants were free to withdraw at any time without any consequences, and the study was approved by the relevant ethics committee. This approach ensured that the research benefited participants while adhering to high ethical standards.

RESULTS AND DISCUSSION

The results of an experimental intervention involving agricultural activities to reduce frailty symptoms in menopausal women in Rambah District will be discussed. Findings from pre-test and post-test measurements and comparisons between the experimental and control groups provide insights into the effectiveness of nature-based interventions in improving the physical and mental health of menopausal women. Analysis of the data obtained, including frailty indicators and mental health assessments (Soysal, 2020), will be explained to understand the impact of agricultural activities on participants. In addition, this section will also discuss the broader implications of the findings in the context of health promotion in rural areas and community-based solutions for menopausal women.

Description of Learning objectives

Table 2. Description of Learning objectives

	N	Minimum	Maximum	Mean	Std. Deviation
Baseline test Experimental Group	30	3	37	15.22	9,422
Final evaluation Experimental Group	30	51	91	76.11	9,993
Baseline test Control Group	30	3	27	12.17	7,278
Final evaluation Control Group	30	40	81	62.67	14,406
Valid N (listwise)	30				

Based on the results presented in Table 2, it can be seen that there is a significant difference between the baseline test and final evaluation in both groups, both the Experimental Group and the Control Group. In the Experimental Group, the average value of the final evaluation (76.11) was much higher than the baseline test value (15.22), indicating a significant increase after participating in the agricultural-based intervention program. In contrast, although there was an increase in the Control Group, the change was not that great, with the average final evaluation (62.67) slightly higher than the baseline test (12.17).

In addition, the higher standard deviations at the final evaluation in both groups indicate a greater outcome variation among individuals after the intervention. Overall (Perera and Perera, 2023).These results indicate that the agricultural activities followed by the Experimental Group had a significant positive effect on reducing frailty symptoms, which is reflected in an increase in the average value in the final evaluation.

Table 3. Normality test

	Kolmogorov-Smirnova			Shapiro Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Final evaluation Experimental Group	.162	100	.200*	.929	100	.189
Final evaluation Control Group	.212	100	.150	.891	100	.1 40

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

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Normality test

In the Experimental Group, the results of the Kolmogorov-Smirnov and Shapiro-Wilk tests showed that the data were normally distributed, with p values of 0.200 and 0.189 ($p > 0.05$), respectively. This indicates that the assumption of normality is well met for this group, allowing the use of parametric tests in further analysis, thus providing more confidence in interpreting the results obtained (Sauer, 2023b).

Results of the Homogeneity Test

Based on the results of the homogeneity of variance test (Levene's Test) presented in Table 4, it can be concluded that there is no significant difference in variance between groups in the Final Evaluation of the Experimental Group. Based on the mean, median, median with adjusted degrees of freedom, and truncated mean, Levene's test results show a significance value greater than 0.05 ($p > 0.05$) (Gonzales, 2024). This indicates that the assumption of homogeneity of variance is met, which means that the data variance between groups is not significantly different. Thus, parametric tests can be applied with confidence that the analysis results are not affected by differences in variance between groups.

Hypothesis Test Results

Based on the results of the independent sample t-test presented in Table 5, there is a significant difference between the Experimental and Control Groups in the Final Evaluation. The Levene test results show that the variance between groups is not the same ($p = 0.014$), which means that we use the t-test results with the assumption of unequal variances (O'Caoimh, 2021). The t-test produces a t-value of 3.253 with a p-value of 0.003 ($p < 0.05$) when the variance assumption is considered the same and unequal. This shows a significant difference between the two groups, indicating that the agricultural-based intervention applied to the Experimental Group has a greater effect than the control group.

The results of this study highlight the significant impact of agricultural activities in reducing frailty symptoms among menopausal women in Rambah District. The findings from the experimental group, who participated in the agricultural program, showed a marked improvement in their physical health (Norman, 2021), with a significant increase in the average score of frailty symptoms from 15.22 at baseline to 76.11 at the final evaluation. This indicates that nature-based interventions, specifically agricultural activities (Annweiler, 2020), can effectively enhance the physical strength, balance, and overall well-being of menopausal women. Several studies support the positive impact of outdoor physical activities on menopausal health. For example, research by Elizabeth, (2020) and Norman, (2021) emphasizes how engaging in nature-based activities, such as farming or gardening, can improve both physical and mental health outcomes for older adults, including menopausal women.

One key factor contributing to the success of agricultural activities is the engagement with nature. Several studies have shown that outdoor physical activities, such as gardening and farming, improve physical health and provide mental health benefits, including stress reduction and improved mood (Mikkelsen, 2020; Damluji, 2021). These activities contribute to building a sense of well-being and accomplishment (Sauer, 2023c). In line with these findings, many participants reported feeling more connected to their community and environment, which also helped reduce the feelings of isolation often experienced during menopause. A direct quote from one of the participants reinforces this idea:

> *"Before joining the farming program, I felt weak and often tired, but now I have more energy and confidence. Working in the garden gives me a sense of purpose and helps me forget about my worries."*

This testimony reflects the psychological benefits mentioned in previous research, suggesting that nature-based activities not only improve physical health but also provide a mental boost that can counteract the emotional toll of menopause (Sauer, 2023d). The mental health benefits of physical activity are widely acknowledged, with studies showing that engaging in physical activity outdoors can reduce feelings of stress, anxiety, and depression (Mikkelsen, 2020).

Despite the positive outcomes observed in the experimental group, the control group showed only a modest

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improvement, further supporting the notion that the agricultural program had a significant effect (Ganesh, 2021). The control group, which did not engage in farming activities, exhibited a minimal change in frailty symptoms, with the final evaluation score increasing slightly from 12.17 to 62.67 (Soiza, 2021). This emphasises the importance of structured interventions in improving the quality of life for menopausal women, particularly in rural settings like the Rambah District. Research has shown that structured, community-based interventions can significantly improve health outcomes, especially in underserved areas (Mikkelsen, 2020).

Moreover, the analysis of normality and homogeneity tests confirmed the statistical methods' suitability. The results of the Kolmogorov-Smirnov and Shapiro-Wilk tests indicated that the data from the experimental and control groups were normally distributed, supporting parametric tests for further analysis. Additionally (DeJong, 2020), Levene's test confirmed that the variances between the groups were equal, reinforcing the reliability of the findings.

One important aspect of this study is its relevance to rural health promotion. Many menopausal women in rural areas, such as Rambah District, often have limited access to healthcare services (Guidet, 2020). This research demonstrates that agricultural activities, a readily available and cost-effective resource in these communities, can be a valuable tool for improving physical and mental health. As one participant explained:

> *"Living in a rural area, finding ways to stay healthy is hard. The farming program gave me something to look forward to, and I feel physically and mentally better."*

This statement underscores the potential of community-based health interventions that use local resources, such as farming, to promote long-term well-being (McCrory, 2021). Using such accessible and affordable interventions, rural communities can develop sustainable health promotion strategies that do not rely solely on traditional medical care but rather harness local resources to improve the overall quality of life (Papadopoulou, 2020).

CONCLUSION

This study suggests that agricultural activities can effectively reduce symptoms of physical weakness in menopausal women in rural areas, particularly in the Rambah District. The results clearly show that women in the experimental group who participated in agricultural activities significantly improved their physical and mental health. The agricultural program substantially improved physical weakness scores, with participants reporting improvements in physical strength, balance, and overall well-being. These findings are supported by existing literature highlighting the positive effects of nature-based activities on health, including reduced stress, improved mood, and increased physical fitness.

This study also highlights the importance of community-based health interventions, especially in rural areas with limited access to health services. The success of the agricultural program suggests that simple and cost-effective solutions, such as integrating agricultural activities into community health strategies, can improve the quality of life of menopausal women. Furthermore, although the control group showed some improvement, the results were insignificant, further supporting the effectiveness of the agricultural intervention.

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