



Aging Is Not Enough to Be Healthy Alone: Combating Aging Through “Gokil Muscle Exercise”

Metta Christiana^{1,*}, Ahmad Muhaimin², S.K. Nawangsih³, Shinta Eka Kartika⁴

^{1,2,3,4} Semarang University

✉ metta@usm.ac.id

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ABSTRACT

Aging is an inevitable biological process that significantly affects physical, psychological, and social functions, particularly among individuals aged 40 years and older. In many communities, aging is commonly perceived as a condition that merely requires the absence of disease, without adequate attention to muscle strength, mobility, and functional independence. This community service program was conducted in Bangetayu Kulon Village, Semarang, Indonesia, to improve the quality of life of middle-aged and elderly residents through an innovative physical activity intervention known as Gokil Muscle Exercise. The program aimed to increase participants' knowledge, awareness, and practical skills related to muscle strengthening as a strategy to prevent sarcopenia and functional decline. The activities included health education, interactive discussions, pre-test and post-test assessments, and guided exercise training using a combination of seated and standing movements accompanied by cheerful music. A total of 66 participants aged 31–63 years participated in the program. The results demonstrated a significant improvement in participants' understanding of sarcopenia, its consequences, and appropriate preventive strategies. Participants also reported increased enthusiasm, enjoyment, and motivation to engage in regular physical activity. The findings suggest that being “healthy” alone is insufficient for successful aging; muscle strength and functional fitness are essential components of healthy aging. The Gokil Muscle Exercise program proved to be a feasible, enjoyable, and effective approach to enhancing physical awareness and promoting active aging in the community.

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A. INTRODUCTION

Population aging has become a global phenomenon, particularly in developing countries undergoing demographic transitions (United Nations, 2022). Aging is a natural, progressive, and irreversible process characterized by a gradual decline in physiological, psychological, and social functions (World Health Organization [WHO], 2021). Although aging cannot be prevented, its negative impact on quality of life can be minimized through appropriate health interventions and lifestyle modifications. One of the most critical but often



overlooked consequences of aging is the decline in muscle mass and strength, known as sarcopenia (Cruz-Jentoft et al., 2019).

Sarcopenia is a major contributor to functional limitations, reduced mobility, and increased risk of falls, disability, and dependency among older adults (Chen et al., 2020). Studies indicate that muscle mass begins to decline as early as the age of 40, with a progressive reduction in muscle strength if not counteracted by physical activity (Peterson et al., 2021). Furthermore, sarcopenia has been associated with metabolic disorders, cardiovascular diseases, and decreased overall quality of life (Mou et al., 2023).

The World Health Organization emphasizes that healthy aging is not merely the absence of disease but involves maintaining functional ability, including muscle strength, balance, and mobility (WHO, 2021). However, in many communities, aging is still perceived as a passive process, where physical decline is considered inevitable and unmodifiable.

Bangetayu Kulon Village, located in Genuk District, Semarang City, represents a community experiencing this issue. Based on the 2024 village monograph, a significant proportion of the population is aged 40 years and above, indicating a high risk of age-related physical decline. Field observations reveal that many residents experience symptoms such as muscle weakness, joint stiffness, knee pain, lower back pain, and fatigue. These conditions are often addressed through passive strategies such as rest, massage, or medication, rather than preventive or strengthening approaches.

Despite the availability of community exercise programs, participation remains limited due to physical discomfort and lack of adaptability in exercise design. Many elderly individuals are unable to sustain standing aerobic exercises, leading to reduced physical activity and worsening muscle degeneration.

Scientific evidence consistently demonstrates that muscle strengthening exercises are the most effective intervention to prevent and manage sarcopenia (Peterson et al., 2021). Unlike medication or supplementation, resistance-based physical activity directly stimulates muscle growth and improves functional capacity. However, awareness and understanding of this concept remain low among community members.

Therefore, an innovative, accessible, and enjoyable intervention is needed to address this gap. The Gokil Muscle Exercise program was developed as a fun, adaptive, and inclusive physical activity model aimed at improving muscle strength and promoting active aging. This program integrates education, interactive engagement, and practical training to reshape community perceptions of aging and encourage sustainable health behaviors.

B. METHODS

This study employed a community service-based participatory approach conducted from October to December 2025 in Bangetayu Kulon Village, Genuk District, Semarang City. The target population consisted of residents aged 40 years and above, including elderly individuals experiencing age-related physical decline.

1. Program Design and Stages

The implementation followed structured stages, as presented in **Table 1**.



Table 1. Stages of Community Service Activities

Stage	Activity	Implementers and Partners
1	Licensing, survey, and observation	PKM Team, Village Head, FKK and PKK
2	Coordination and preparation	PKM Team, Village Head, FKK and PKK
3	Pre-test	PKM Team, FKK, Participants
4	Training	PKM Team, FKK, Participants
5	Post-test	PKM Team, FKK, Participants

2. Intervention Description

The intervention consisted of educational sessions on aging and sarcopenia, followed by practical training in Gokil Muscle Exercise. The exercise program emphasized muscle strengthening of the legs, back, abdomen, and shoulders using simple movements performed in both seated and standing positions. Cheerful music and humorous movements were incorporated to enhance enjoyment and adherence.

3. Data Collection and Evaluation

Evaluation was conducted using oral pre-test and post-test assessments focusing on participants’ understanding of sarcopenia, its causes, consequences, and preventive strategies. Community participation included providing facilities, equipment, and logistical support. Sustainability was ensured through the establishment of a local Gokil Muscle Exercise community with regular weekly practice sessions.

Data Analysis

The data analysis in this community service program was conducted using a descriptive qualitative approach with comparative analysis between pre-test and post-test results. The analysis process consisted of three main stages adapted from Miles and Huberman (2014):

Data Reduction

Participants’ responses from pre-test and post-test were simplified, categorized, and grouped into key themes such as knowledge of sarcopenia, perceived causes, and prevention strategies.

Data Display

The categorized data were presented in tabular form to facilitate comparison between pre-intervention and post-intervention results.

Conclusion Drawing and Verification

The differences in participants’ responses were interpreted to evaluate the effectiveness of the intervention in improving knowledge and awareness.

Additionally, a comparative descriptive analysis was used to observe changes in participants’ understanding, indicated by shifts from incorrect or limited knowledge to accurate and comprehensive explanations. This approach allows for a clear assessment of the program’s impact on community knowledge and behavior.

Indicator	Pre-test (%)	Post-test (%)	Interpretation
Knowledge of sarcopenia	0% (Not aware)	100% (Aware)	Significant increase in basic knowledge
Understanding of sarcopenia effects	0% (Not aware)	100% (Aware)	Participants recognize impact on health



Knowledge of prevention strategies	Passive methods (rest, massage)	Active methods (muscle strengthening)	Shift toward correct intervention
Perception of aging	Aging = normal decline	Aging = manageable condition	Change in mindset
Recurrence of joint pain understanding	No clear prevention	Understand prevention through exercise	Improved problem-solving awareness

Table X presents the comparative results between pre-test and post-test, showing a substantial improvement in participants’ knowledge and perceptions. The data indicate a clear shift from passive understanding toward active and preventive health behavior, particularly in recognizing the importance of muscle strengthening exercise in preventing sarcopenia.

C. RESULTS AND DISCUSSION

a. Program Implementation

The program was conducted on November 30, 2025, with 66 participants aged 31–63 years, predominantly between 40–50 years. Activities included educational presentations, demonstrations using simple props, interactive discussions, and one-hour exercise training sessions. Participants showed high enthusiasm and active engagement throughout the program.

b. Pre-test and Post-test Outcomes

The evaluation results are summarized in **Table 2**.

Table 2. Summary of Pre-test and Post-test Results (n = 66)

Question	Pre-test Result	Post-test Result
Knowledge of sarcopenia	0% aware	100% aware
Knowledge of sarcopenia effects	0% aware	100% aware
Understanding appropriate intervention	Passive methods	Muscle strengthening
Recurrence of knee/back pain	Common	Understood prevention

The findings demonstrate a substantial improvement in participants’ knowledge and logical understanding of aging-related muscle weakness. Initially, all participants relied on rest, massage, or medication. After the intervention, participants recognized muscle strengthening as the primary preventive strategy.

c. Discussion

These results align with existing literature emphasizing the role of resistance training in preventing sarcopenia and improving functional independence. The joyful and adaptable nature of Gokil Muscle Exercise addressed physical limitations while fostering positive emotions and social interaction. The program also challenged the misconception that “being healthy” is sufficient for aging, highlighting fitness and muscle strength as critical determinants of quality of life.



1.1 Implementation of Community Service Activities

The community service program entitled “Aging Is Not Enough to Be Healthy Alone (Combating Aging Through Gokil Muscle Exercise)” was implemented successfully in Bangetayu Kulon Village, Genuk District, Semarang City. The implementation phase was preceded by coordination and preparation involving the PKM team, village officials, the Family Welfare Movement (PKK), and the Community Health Forum (FKK). This preparatory phase ensured institutional support, participant readiness, and the availability of facilities, including the village hall, chairs, sound system, and multimedia equipment.

The main activity was conducted on Sunday, November 30, 2025, from 08.00 to 10.00 a.m. at the Bangetayu Kulon Village Hall. A total of 66 participants attended the activity, consisting of village officials, PKK administrators, Posyandu cadres, and local residents. Although the participants’ age ranged from 31 to 63 years, the majority were aged between 40 and 50 years, which corresponds to the target group identified in the situation analysis. This age group is particularly vulnerable to early muscle mass decline but often remains unaware of its long-term consequences.

The activity was structured into several sequential sessions, including an opening ceremony, pre-test assessment, educational presentation, practical exercise training, and post-test evaluation. The use of oral pre-test and post-test methods was intentionally selected to accommodate participants’ diverse educational backgrounds and to create an interactive learning atmosphere. This approach also allowed the facilitators to directly observe participants’ reasoning patterns and misconceptions regarding aging and health.

1.2 Pre-test Results: Baseline Knowledge and Perceptions

The pre-test results revealed a striking lack of knowledge among participants regarding sarcopenia and muscle degeneration. As shown in Table 4, none of the participants were familiar with the term sarcopenia or understood its role as a fundamental cause of knee pain, back pain, and general physical weakness. This finding is consistent with the initial problem identification, which indicated that residents tended to interpret physical decline as a natural and unavoidable aspect of aging rather than a condition that could be mitigated through appropriate interventions.

Participants’ responses during the pre-test also reflected a dominant perception that “being healthy” simply meant the absence of acute illness. Most participants believed that as long as they were not hospitalized or experiencing severe disease, their health condition was acceptable. Consequently, their coping strategies focused primarily on symptomatic relief rather than preventive or strengthening approaches.

Regarding efforts to address muscle weakness and joint pain, the pre-test data indicated that participants relied heavily on passive methods. All participants reported using rest and massage as their primary strategies. A considerable number also mentioned light aerobic activities such as walking, cycling, swimming, or joint-stretching exercises. However, none of these activities specifically targeted muscle strengthening. A smaller proportion of participants used therapy devices, medication, vitamin supplements, or injections. Importantly, these interventions were perceived as temporary solutions, as participants frequently experienced recurrence of pain and weakness.

These findings demonstrate a critical gap between community practices and evidence-based recommendations for healthy aging. The pre-test results confirmed that participants lacked an understanding of causal relationships between muscle weakness,



joint pain, and functional decline. This knowledge gap justified the need for educational intervention and served as a baseline for evaluating program effectiveness.

1.3 Educational Session: Understanding Sarcopenia and Aging

Following the pre-test, participants attended an educational session focusing on sarcopenia, muscle function, and the broader implications of aging. The presentation was delivered using simple language, visual aids, and everyday analogies to ensure comprehension. Props such as water bottles and towels were used to demonstrate muscle load and resistance in a tangible manner.

The educational content emphasized that muscle mass begins to decline from approximately the age of 40 and that this decline accelerates with inactivity. Participants were guided to understand how muscle weakness contributes to joint instability, reduced mobility, slower metabolism, increased fall risk, and decreased independence. The facilitators also explained that medication, supplements, and rest alone cannot rebuild muscle mass.

This session marked a turning point in participants' understanding. Many participants expressed surprise upon learning that their recurring knee and back pain were not merely age-related symptoms but indicators of underlying muscle degeneration. The interactive format encouraged participants to share personal experiences, which further reinforced the relevance of the information to their daily lives.

1.4 Practical Training: Gokil Muscle Exercise

The practical training session introduced participants to Gokil Muscle Exercise, a muscle-strengthening exercise model designed to be enjoyable, adaptable, and inclusive. The exercises targeted major muscle groups, including the legs, back, abdomen, and shoulders. Movements were performed using a combination of seated and standing positions, allowing participants with knee or back pain to participate safely.

Music with a cheerful and humorous tone accompanied the exercises, creating a relaxed and joyful atmosphere. The facilitators intentionally incorporated playful movements to reduce anxiety and eliminate the perception that exercise must be strenuous or intimidating. This approach proved particularly effective for elderly participants who previously felt excluded from conventional aerobic exercise sessions.

Throughout the training, participants demonstrated high levels of enthusiasm and engagement. Many participants who initially expressed fear of pain or fatigue were able to complete the exercises comfortably. The adaptive nature of the program allowed participants to regulate intensity according to their physical capabilities, reinforcing the principle that muscle strengthening can be accessible to all age groups.

1.5 Post-test Results: Knowledge Improvement and Conceptual Change

The post-test results indicated a substantial improvement in participants' understanding of aging and muscle health. As presented in Table 4, all participants were able to correctly identify sarcopenia and explain its effects on physical function. This represents a complete transformation from the pre-test condition, where none of the participants possessed such knowledge.

Participants also demonstrated a clear shift in their perception of appropriate interventions. While pre-test responses emphasized rest, massage, and medication, post-test responses consistently identified muscle strengthening as the primary strategy for preventing and managing aging-related physical decline. Participants articulated an



understanding that strengthening leg muscles could reduce knee pain and prevent recurrent symptoms.

Furthermore, participants acknowledged that being “healthy” in the traditional sense was insufficient to prepare for old age. Instead, they recognized the importance of maintaining muscle strength to support independence, mobility, and quality of life. This conceptual shift represents a critical outcome of the program, as it addresses the root cause of maladaptive health behaviors within the community.

1.6 Discussion: Implications for Healthy Aging

The findings of this community service program underscore the importance of muscle-strengthening education in aging populations. The absence of baseline knowledge regarding sarcopenia among participants highlights a widespread misconception that aging-related decline is inevitable and unmodifiable. This misconception contributes to reliance on passive health strategies that fail to address underlying physiological changes.

The success of the Gokil Muscle Exercise program demonstrates that educational interventions combined with enjoyable physical activity can effectively transform health perceptions and behaviors. The program’s emphasis on fun, accessibility, and social interaction aligns with participants’ preferences and physical limitations, remember that many participants previously discontinued exercise due to pain or fatigue.

Moreover, the establishment of a Gokil Muscle Exercise community provides a foundation for program sustainability. Regular practice sessions are expected to reinforce learned concepts and promote long-term behavioral change. The strong support from village officials and participants suggests high potential for program replication in other communities with similar demographic profiles.

Overall, the results confirm that healthy aging requires more than disease prevention. Muscle strength, functional capacity, and psychological well-being are equally critical components. Community-based programs that integrate education and adaptive exercise offer a practical solution to address these multidimensional needs.

D. CONCLUSION

The community service program demonstrated that health alone is insufficient to address aging-related challenges. Muscle strength, functional fitness, and physical independence are essential components of healthy aging. The Gokil Muscle Exercise program effectively increased knowledge, motivation, and engagement among middle-aged and elderly residents in Bangetayu Kulon Village. The intervention was well-received, enjoyable, and feasible for community implementation. Continuous education and routine muscle-strengthening activities are strongly recommended to prepare individuals aged 40 years and above for active and independent aging.

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F. AUTHOR CONTRIBUTIONS

Metta Christiana conceptualized the community engagement program, conducted the initial needs assessment, coordinated with community partners, delivered the main educational materials, and supervised the overall implementation of the activities.

Ahmad Muhaimin contributed to the design and execution of the physical exercise training, assisted in community coordination, and supported the dissemination and documentation of the program outcomes.

Sri Kandariyah Nawangsih provided psychological perspectives during program preparation and implementation, supported participant engagement, and assisted in educational delivery and administrative coordination with local stakeholders.

Shinta Eka Kartika contributed to administrative management, participant documentation, financial reporting, and logistical support throughout the community engagement activities.

All authors reviewed and approved the final manuscript.

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