Strengthening The Role of Elderly Posyandu Through Digital-Based Health Education and Degenerative Disease Screening

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ABSTRACT

Elderly Posyandu serves as a frontline preventive health service for older adults in the community. However, challenges such as low digital literacy among cadres and the lack of early detection of degenerative diseases often hinder its optimal role. This community service program aimed to strengthen the role of Posyandu Lansia Melati 2 in Jelobo Village, Klaten, through digital-based health education, early screening of degenerative diseases, and cadre empowerment. The activities included free health check-ups for older adults, educational sessions on degenerative disease prevention, digital skills training for posyandu cadres, and motor activities to maintain cognitive and physical function in the elderly. The results showed a substantial improvement in both cadre competence and elderly health literacy. Before the intervention, only 20% of cadres understood degenerative diseases, and 13% could deliver health education, while none were able to use digital media. After the training, 100% of cadres were able to explain degenerative diseases, use digital tools for health data recording, and create digital educational media. Among the elderly, understanding of degenerative diseases increased from 20% to 90%, and knowledge of preventive measures rose from 13% to 83%. These findings indicate that the program effectively enhanced the quality and sustainability of elderly posyandu services in the digital era.

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INTRODUCTION

According to the 2018 Basic Health Research (Riskesdas), the prevalence of diabetes mellitus among the elderly population in Indonesia reached 6.29%, while hypertension was reported at 63.2%. In Central Java Province, the proportion of elderly residents increased by 13.87% in 2020, accompanied by a rise in the prevalence of diabetes (1.59%) and hypertension (12.9%) (Safitri et al., 2023). Over the past five decades, the global elderly population has grown significantly, along with an increasing prevalence of type diabetes mellitus (TDM). Currently, nearly half of all individuals with diabetes mellitus are aged ≥65 years. This condition poses a major challenge, as older adults with TDM are more likely to experience complex medical complications (Bellary et al., 2021; Dewi et al., 2025)

Systemic degenerative diseases are conditions characterized by the progressive deterioration of tissues and organs over time. These diseases have a significant impact on public health and place a substantial burden on healthcare systems. As the number of elderly people continues to rise, the prevalence of degenerative diseases also increases. Degenerative conditions—such as neurodegenerative diseases, hypertension, and diabetes—have become a growing public health concern in Indonesia (Sheikh et al., 2024) (Dewi et al., 2024). Chronic degenerative diseases (CDD), including obesity, cardiovascular disease (CVD), diabetes, chronic kidney disease (CKD), inflammatory bowel disease, osteoporosis, sarcopenia, neurodegenerative diseases such as Huntington's disease (HD), rheumatoid arthritis (RA), chronic respiratory diseases, and various types of cancer, are among the leading causes of long-term disability and mortality worldwide (Di Renzo et al., 2021).

The impact of degenerative diseases not only reduces the quality of life of older adults but also increases the national economic burden due to the high cost of treatment and long-term care (Chendra et al., 2020; Qonita et al., 2021). Aging itself is a major risk factor for most neurodegenerative diseases, such as Alzheimer's disease (AD) and Parkinson's disease (PD), with approximately one in ten individuals aged ≥65 years affected by AD, and its prevalence continues to rise with advancing age (Hou et al., 2019). Currently, there are no effective treatments available for most age-related neurodegenerative diseases, which are typically progressive and irreversible, leading to a substantial social and economic burden. Therefore, prevention efforts, early detection, and increased public awareness are essential (Rakainsa et al., 2023; Runtu et al., 2024).

In Indonesia, Posyandu Lansia (Integrated Health Post for the Elderly) is a community-based health service focusing on promotive and preventive efforts for older adults. It plays an important role in providing health education, monitoring health conditions, and supporting the quality of life of the elderly on an ongoing basis (Lauchan et al., 2024). However, its implementation still faces several challenges, including limited knowledge among community health cadres, inadequate health record-keeping facilities, and the low utilization of digital technology for health education and monitoring (Karimullah et al., 2023).

According to Law No. 13 of 1998, an elderly person is defined as someone aged 60 years or older, who has the same rights as other citizens to participate in community, national, and state life (Heryani, 2023). Indonesia is projected to experience a 41.4% increase in its elderly population in the coming years, one of the fastest growth rates in the world. One of the government's efforts to promote the well-being of the elderly is through the Posyandu Lansia program, which aims to monitor their health conditions, provide basic health services, and enhance their social participation and well-being (Akbar et al., 2021). However, public awareness of early detection remains low, even though degenerative diseases such as heart disease are still among the leading causes of death (Cahyati et al., 2022).

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Based on these conditions, this community service program was implemented to improve the knowledge and awareness of older adults regarding the importance of maintaining health and preventing degenerative diseases, as well as to conduct early screening for degenerative disease risk factors among the elderly. In addition, this program aimed to empower Posyandu Lansia cadres by providing digital skills training, enabling them to record and monitor the health status of older adults in a sustainable manner. The expected outcomes of this program include increased understanding among older adults regarding healthy aging practices, enhanced motivation to undergo regular health check-ups as part of early detection efforts, and improved capacity of Posyandu cadres in utilizing digital technology to support elderly health services. Ultimately, this program is expected to strengthen the role of Posyandu Lansia as the frontline in promotive and preventive efforts to address degenerative diseases within the community. This program was funded through the Community Empowerment Scheme under the Community Partnership Empowerment scope, as part of the Community Service Program Grant from the Directorate of Research and Community Service, Directorate General of Research and Development, Ministry of Higher Education, Science, and Technology (2025 funding year).

METHOD

This community service activity employed a pre–post intervention study design without a control group. It was conducted at Posyandu Lansia Melati 2, Jelobo Village, Wonosari Subdistrict, Klaten Regency, Central Java. The participants consisted of 15 elderly Posyandu cadres and 30 active elderly members. The inclusion criteria for cadres were being active members of Posyandu Lansia Melati 2 and willingness to participate in all program sessions. The inclusion criteria for elderly participants were being aged ≥60 years, registered as active Posyandu members, able to communicate, and willing to participate. Participants who attended less than 50% of the total sessions were excluded from the evaluation. The main objective of this program was to optimize elderly health services through digital-based health education, early screening for degenerative diseases, and strengthening the capacity of elderly Posyandu cadres. The implementation was divided into four phases: preparation and socialization, implementation and mentoring, development and interim evaluation, and final evaluation with program handover. In the preparation and socialization phase, activities included introducing the program to cadres and elderly participants, conducting effective communication training for cadres, delivering education on degenerative diseases (diabetes mellitus, hypertension, and neurodegenerative disorders) for elderly participants, providing training on using digital applications for health record-keeping, offering puzzle-based motor skills exercises, and conducting initial basic health checks. The implementation and mentoring phase involved assisting cadres in using the digital application, performing the second round of health screening for elderly participants, and continuing the motor skills training. During the development and interim evaluation phase, cadres received ongoing guidance on using the digital application, a third round of health screening was conducted, and follow-up education was delivered based on the interim evaluation results, focusing on healthy lifestyle practices. This phase also aimed to enhance elderly participation in the motor skills exercises. The final evaluation and program handover phase included the last health screening, evaluation of changes in knowledge and skills through oral assessments, and evaluation of the elderly participants' health status. The program concluded with the handover of activity outcomes, educational media, and access to the digital application to the cadres to ensure program sustainability. Cadres' knowledge and skills improvement were measured through oral assessments, while the health status of the elderly participants was evaluated by measuring blood pressure and random blood glucose levels. All participants provided

verbal informed consent, and their personal data were kept strictly confidential.
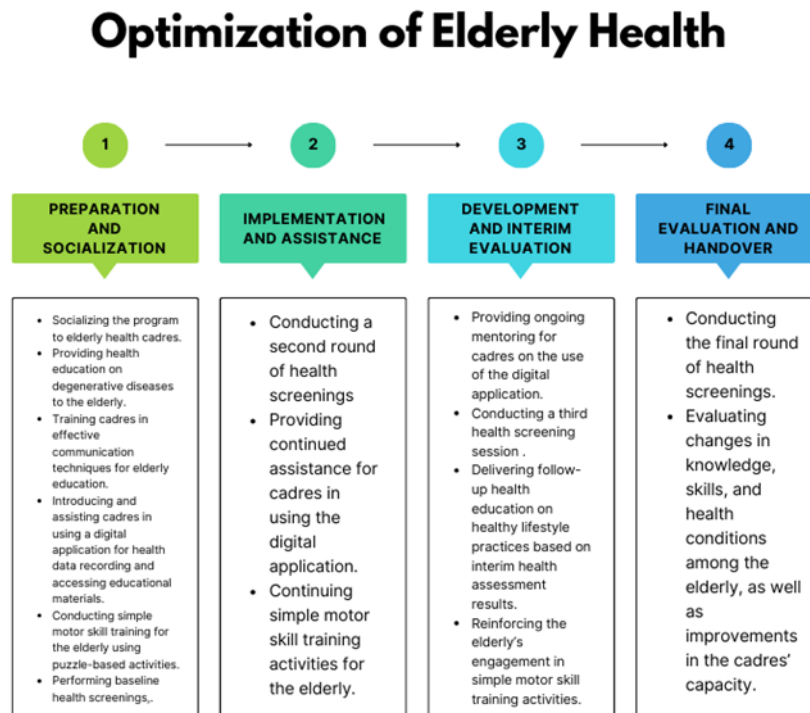
Optimization of Elderly Health

FIGURE 1. Method used for the community service program

RESULTS AND DISCUSSION

The community service program conducted at Posyandu Lansia Melati 2, Jelobo Village, Wonosari District, Klaten Regency successfully involved 15 active elderly posyandu cadres and 30 older adult participants. This number exceeded the initial target and reflected a strong enthusiasm from the target community toward strengthening community-based elderly health services. Overall, the program demonstrated significant improvements in two main aspects: (1) enhancing the capacity of posyandu cadres, and (2) improving the knowledge and engagement of older adults in preventing degenerative diseases through the use of digital technology and simple motoric activities.

Older adults are considered a vulnerable population due to declining physical, cognitive, and psychosocial functions associated with aging, which increases their risk of developing degenerative diseases such as diabetes mellitus, hypertension, heart disease, stroke, and neurodegenerative disorders (Tuwu & La Tarifu, 2023). Elderly Posyandu, as a community-based health service, plays a strategic role in promotive and preventive efforts, including regular health monitoring, nutrition counseling, physical activity, and social-spiritual engagement, which collectively improve the quality of life among older adults (Kaeni et al., 2021).

Before the training, assessment results showed that among the 15 participating cadres, only 3 (20%) understood the basics of degenerative diseases, 2 (13%) were able to provide health education, and none were familiar with digital educational media or artificial intelligence (AI). After the training, all cadres (100%) demonstrated understanding of degenerative diseases, were able to provide health education, and could create digital health education media (posters/infographics) while also utilizing basic AI features for simple data analysis related to elderly health.

TABLE 1. Posyandu Cadres' Level of Understanding Before and After Training

Cadre Competency Indicators	Before Training	After Training
Understanding degenerative diseases	20%	100%
Able to provide health education	13%	100%

This improvement aligns with the findings of Rosita & Mahmudah (2025), who stated that community-based educational strategies significantly enhance health literacy among cadres and accelerate the adoption of digital technology in community health services. In recent years, AI technology has rapidly advanced in the health sector, supporting population health trend analysis, disease diagnosis, and personalized treatment (Rosita & Mahmudah, 2025; Shalahuddin et al., 2025). Sumarni et al. (2024) also emphasized that health education can improve cadres' knowledge and skills in the early detection of degenerative diseases, which contributes to strengthening elderly posyandu services. The application of digital tools in this program improved the efficiency of data recording, expanded the reach of health education, and motivated cadres to develop more engaging educational content (Sumarni et al., 2024).

Among the older adult participants, before the session, only 6 (20%) were aware of common degenerative diseases, and 4 (13%) understood their preventive measures. After receiving the educational intervention, these numbers increased to 27 (90%) and 25 (83%), respectively.

TABLE 2. Improvement in Older Adults' Understanding of Degenerative Diseases

Indicators of Elderly Understanding	Before Education	After Education
Knowledge of types of degenerative diseases	20%	90%
Knowledge of preventive measures	13%	83%

These findings support Shalahuddin et al. (2025), who emphasized that education on the prevention of type 2 diabetes mellitus and other degenerative diseases can effectively reduce the risk among the elderly population. Degenerative diseases such as diabetes and hypertension often occur as comorbid conditions and are major contributors to decreased quality of life and increased long-term healthcare costs (Chendra et al., 2020; Qonita et al., 2021; Shalahuddin et al., 2025).

In addition to education, this program incorporated simple motoric activities, such as target-shooting exercises and puzzle games, as non-pharmacological interventions to maintain cognitive function in older adults. Structured physical activities have been shown to stimulate brain function, maintain focus, and improve motor coordination, thereby preventing cognitive decline that can lead to dementia (Asrina Pitayanti & Faqih Nafiul Umam, 2023; Ennimay et al., 2024). During this activity, participants showed improved focus and coordination, demonstrated by their better ability to follow motor instructions in the final session compared to the initial session. This improvement suggests that incorporating simple physical activities is an effective approach to supporting cognitive function and enhancing the quality of life in older adults.

Overall, this community service program provided comprehensive positive impacts. The systematic transfer of knowledge to cadres strengthened the capacity of elderly posyandu services and encouraged the sustainable use of digital technology. Meanwhile, the increase in health literacy and active participation among older adults showed that community-based educational approaches can be an effective strategy to prevent degenerative diseases and improve the holistic quality of life among the elderly.

FIGURE 2. Community service activities at Posyandu Lansia Melati 2, Jelobo Village, Klaten, involving social health education for cadres and older adults.

FIGURE 3. Community service activities at Posyandu Lansia Melati 2, Jelobo Village, Klaten, include health screening for older adults and motoric activities to support cognitive function.

CONCLUSION

The community service program implemented at Posyandu Lansia Melati 2 in Jelobo Village, Klaten, demonstrated that digital-based health education, early screening for degenerative diseases, and the empowerment of posyandu cadres can enhance older adults' knowledge of disease prevention and strengthen cadres' skills in using digital media for health education and record-keeping. This program has contributed positively to improving the quality of elderly health services and supporting the sustainability of posyandu activities in the digital era. However, these results are still preliminary, as the study used a pre–post design without a comparison group and involved a limited number of participants; therefore, the findings should be generalized with caution. Continued mentoring for posyandu cadres is needed to ensure the optimal application of digital skills, along with support from local village governments and community health centers to provide digital facilities and basic health screening tools regularly. Future large-scale studies are recommended to assess the long-term sustainability and broader impact of this program.

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