

Effectiveness of a Self-Empowerment Intervention Based on the Successful Aging Framework in Enhancing Self-Efficacy Among Older Adults at the Belimbing Primary Health Center, Padang City, Indonesia

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Abstract

Background: The accelerating global aging trend has intensified psychosocial challenges among older adults, among which declining self-efficacy is a well-established predictor of deteriorating self-care capability and diminished quality of life. However, primary healthcare services in developing countries such as Indonesia rarely provide structured, brief psychosocial interventions capable of addressing this problem within routine community-based elderly care. Baseline data from the Belimbing Primary Health Center (Puskesmas), Padang City, revealed that 61.4% of registered older adults exhibited low self-efficacy levels, while the existing Posyandu Lansia program remained focused predominantly on physical health screening, underscoring an urgent service gap and the need for a feasible, structured psychosocial intervention.

Objective: This study aimed to evaluate the effectiveness of a self-empowerment intervention grounded in the successful aging framework on self-efficacy among older adults at the Belimbing Primary Health Center, Padang City, Indonesia.

Methods: A quasi-experimental study employing a one-group pretest-posttest design was conducted among 34 older adults, recruited via purposive sampling with allowance for an anticipated 10% dropout rate. Self-efficacy was assessed using the General Self-Efficacy Scale (GSE-10; score range 10-40). The intervention consisted of four structured psychoeducation sessions delivered over two weeks. Data were analyzed using the paired sample t-test ($\alpha = 0.05$).

Results: The mean GSE-10 score improved significantly from 24.1 (SD = 4.5) at pretest to 30.6 (SD = 3.8) at posttest, representing an absolute gain of 6.5 points. The paired t-test confirmed a statistically significant difference ($t(33) = -7.84$; $p < 0.001$), with a large effect size (Cohen's $d = 1.56$). Statistical power analysis yielded a power of 0.99.

Conclusion: The self-empowerment intervention based on successful aging produced a statistically significant and large improvement in self-efficacy among older adults in a primary healthcare setting. As this was a single-group, non-controlled design, these findings should be regarded as preliminary and hypothesis-generating; nonetheless, this brief, structured model holds promise for integration into existing Posyandu Lansia (community elderly health post) programs and warrants confirmation through randomized controlled trials.

Keywords: Self-Empowerment; Successful Aging; Self-Efficacy; Older Adults; Primary Health Care; Psychosocial Intervention; Indonesia.

1.0 Introduction

The accelerating global demographic transition toward an aging population represents one of the most critical public health challenges of the twenty-first century. The World Health Organization (2023) projects that the global population aged 60 years and older will increase from approximately one billion in 2020 to 2.1 billion by 2050, with the majority of this growth occurring in low- and middle-income countries. In Indonesia, the Central Bureau of Statistics (Badan Pusat Statistik, 2023) reported that the older adult population has reached 29.1 million (10.6%) and is projected to rise to 47.7 million by 2035.

In the context of aging, self-efficacy functions as a pivotal psychological determinant that influences health behavior, stress resilience, and adaptive capacity. Self-efficacy refers to an individual's belief in their own capacity to organize and execute the courses of action required to manage prospective situations (Bandura, 1997). Among older adults, this belief is expressed in concrete, everyday capacities – for example, confidence in independently managing a chronic illness regimen, in problem-solving an unexpected setback such as a missed medication dose or a minor fall, or in remaining socially engaged and self-reliant despite physical limitations. Longitudinal evidence confirms that declining self-efficacy is an independent predictor of deteriorating self-care capability and diminished quality of life among older adults (Du *et al.*, 2024; Wang *et al.*, 2024). A systematic review by Trica *et al.* (2024), encompassing 47 studies, consistently demonstrated that low self-efficacy is associated with adverse well-being outcomes, even after controlling for comorbidities. Within theoretical frameworks of health behavior, self-efficacy serves not only as a direct behavioral predictor but also as the primary cognitive mechanism mediating behavioral change (Bandura, 1997).

The successful aging paradigm, conceptualized by Rowe and Kahn (1997), defines successful aging as a multidimensional construct encompassing optimal physical function, active social engagement, psychological well-being, and adaptive capacity. More recent scholarship has increasingly emphasized the subjective dimension of successful aging, recognizing how older adults personally interpret quality of life and the aging process as a determinant of well-being (Sabatini, 2024). This conceptual evolution creates opportunities for developing psychosocial interventions grounded in individual empowerment.

The self-empowerment approach is conceptually congruent with self-efficacy enhancement. Empowerment extends beyond knowledge acquisition to reinforce an individual's sense of control and autonomy in health decision-making. Rappaport (1987) characterized empowerment as a process enabling individuals to gain mastery over their lives, while Zimmerman (1995) elaborated that the intrapersonal dimension of empowerment is directly linked to self-efficacy improvement. Recent empirical evidence demonstrates that empowerment-based interventions enhance self-efficacy through increased active participation, self-reflection, and mastery experience reinforcement (Chen *et al.*, 2024; Lopez *et al.*, 2023).

Despite growing evidence supporting empowerment-based interventions, implementation in primary healthcare settings in developing countries remains limited. Most existing interventions are characterized by extended durations (typically six sessions or more, spanning 8-12 weeks) and single-dimensional foci (Kim & Park, 2022; Shahabi *et al.*, 2024), rendering them impractical in resource-constrained environments such as Indonesian community health centers (Puskesmas). A literature review spanning 2020-2025 identified three critical research gaps: (1) an intervention gap reflecting the scarcity of brief, empowerment-based interventions

applicable in primary care, as most published protocols require multiple sessions delivered over several weeks (Shahabi *et al.*, 2024); (2) a mechanistic gap due to limited research examining self-efficacy specifically as a targeted mediating mechanism within empowerment interventions, rather than as a secondary outcome (Chen *et al.*, 2024; Lopez *et al.*, 2023); and (3) a contextual gap resulting from insufficient empirical evidence from developing countries, particularly Indonesia, with the majority of existing empowerment-based trials for older adults concentrated in East Asian, Middle Eastern, or high-income settings (Trica *et al.*, 2024).

Baseline data from the Belimbing Primary Health Center revealed that 61.4% of registered older adults exhibited low self-efficacy scores, while the existing Posyandu Lansia program remained predominantly focused on physical health screening without structured psychosocial components. National data (Risksedas, 2023) further indicated that 34.5% of older adults experienced mild-to-moderate depression, 42.8% had limitations in activities of daily living, and only 28.3% demonstrated adequate self-care capability.

Therefore, this study aimed to examine the effectiveness of a self-empowerment approach intervention based on the successful aging framework on self-efficacy among older adults at the Belimbing Primary Health Center, Padang City. The findings are expected to provide theoretical contributions to integrative intervention model development and practical contributions to strengthening community-based geriatric health services in Indonesia.

2.0 Methodology

2.1 Research Design

This study employed a quasi-experimental design with a one-group pretest-posttest approach. Although the design lacks a control group, this choice was ethically justified and consistent with resource limitations inherent to primary healthcare settings, and it carries established precedent in psychosocial intervention research among older adults (Foster & Walker, 2021).

2.2 Population, Sample, and Sample Size Justification

The study population comprised all older adults aged 60 years and above actively registered in the Posyandu Lansia program within the Belimbing Primary Health Center catchment area, encompassing five sub-districts (Belimbing, Anduring, Kuranji, Ampang, and Pasar Ambacang), with a total active older adult population of approximately 340 individuals.

Sample size was determined using G*Power 3.1 for a two-tailed paired-samples t-test. Because no prior Indonesian study had reported an empirically derived effect size for empowerment-based interventions targeting self-efficacy in older adults at the time of protocol design, a conventional medium effect size ($d_z = 0.50$) was adopted as a conservative, literature-independent planning benchmark, following Cohen's (1988) standard classification. With $\alpha = 0.05$ (two-tailed) and power = 0.80, the minimum required sample was 34 participants. To account for an anticipated 10% dropout rate, 38 older adults were initially targeted for recruitment; as no participant withdrew during the study period, the final analyzed sample remained at 34. A post hoc sensitivity analysis confirmed that with $n = 34$, $\alpha = 0.05$, and power = 0.80, the design was capable of reliably detecting an effect size as small as $d_z \approx 0.50$ – that is, considerably smaller than the effect ultimately observed ($d = 1.56$). The medium-effect assumption used for planning purposes should therefore be interpreted as a conservative benchmark rather than an empirically calibrated estimate, and future studies are encouraged to use pilot data from Indonesian populations to refine sample size calculations.

Inclusion criteria were: (1) age 60 years or above; (2) active enrollment in the Posyandu Lansia program; (3) absence of severe cognitive impairment (Mini-Mental State Examination [MMSE] score ≥ 18); (4) willingness to participate in all intervention sessions (written

informed consent); and (5) adequate verbal communication ability. Exclusion criteria included the presence of acute medical conditions or hospitalization during the study period.

2.3 Measurement Instrument

Self-efficacy (Table 1) was measured using the General Self-Efficacy Scale (GSE-10), originally developed by Schwarzer and Jerusalem (1995) and validated in the Indonesian language version (Cronbach's alpha = 0.86). The GSE-10 consists of 10 statements rated on a four-point Likert scale (1 = Not at all true; 2 = Hardly true; 3 = Moderately true; 4 = Exactly true), yielding a total score range of 10 to 40. Higher scores indicate greater self-efficacy. Interpretation categories were: 10-19 = low; 20-29 = moderate; 30-40 = high.

Table 1
General Self-Efficacy Scale (GSE-10) Items and Scoring

No.	Item Statement (GSE-10)	Min Score	Max Score
1	I can always manage to solve difficult problems if I try hard enough.	1	4
2	If someone opposes me, I can find the means and ways to get what I want.	1	4
3	It is easy for me to stick to my aims and accomplish my goals.	1	4
4	I am confident that I could deal efficiently with unexpected events.	1	4
5	Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	4
6	I can solve most problems if I invest the necessary effort.	1	4
7	I can remain calm when facing difficulties because I can rely on my coping abilities.	1	4
8	When I am confronted with a problem, I can usually find several solutions.	1	4
9	If I am in trouble, I can usually think of a suitable solution.	1	4
10	I can handle whatever comes my way.	1	4
TOTAL SCORE (Range)		10	40

Source: Schwarzer & Jerusalem (1995). Adapted to Bahasa Indonesia. Scoring: 1 = Not at all true, 2 = Hardly true, 3 = Moderately true, 4 = Exactly true.

2.4 Intervention Protocol

The intervention comprised four structured psychoeducation sessions delivered over two weeks (two sessions per week, each lasting 60 minutes). Each session systematically integrated core self-empowerment components: (1) Session 1 - Control: developing autonomous decision-making capacity; (2) Session 2 - Participation: promoting active engagement in social and health-related activities; (3) Session 3 - Critical Awareness: enhancing self-understanding and

recognition of personal potential; and (4) Session 4 - Access to Resources: optimizing utilization of available healthcare services and social support networks.

Sessions were facilitated by trained nurses using interactive lectures, group discussions, and self-reflection exercises. Pretest measurements were conducted one week prior to the commencement of the intervention, and posttest measurements were administered one week following the completion of the final session.

2.5 Data Analysis

Data analysis was performed using SPSS version 25.0. Descriptive statistics were computed to characterize the respondents (mean, standard deviation, frequency, and percentage). Normality was assessed using the Shapiro-Wilk test (appropriate for $n < 50$). Since data were normally distributed, the paired sample t-test was applied to compare pretest and posttest scores ($\alpha = 0.05$). Effect size was calculated using Cohen's d .

2.6 Ethical Considerations

This study was approved by the Health Research Ethics Committee of Lincoln University College. In addition to formal ethical approval and registration, this study adhered to established ethical principles governing human research, including: (1) Informed consent - all participants received complete information regarding the study's purpose, benefits, and procedures prior to voluntary participation; (2) Confidentiality - participant data were strictly protected and utilized solely for research purposes; and (3) Right to withdrawal - participation was entirely voluntary, with participants permitted to withdraw at any time without adverse consequences.

3.0 Results

3.1 Respondent Characteristics

All 34 recruited participants completed the study with no dropout during the intervention period. Sociodemographic characteristics are presented in Table 2. The mean age of respondents was 68.0 years ($SD = 8.63$), ranging from 60 to 85 years. The majority were female (64.7%) and had attained junior or senior secondary education (55.9%). The broad age range reflects the demographic heterogeneity of the older adult population within the Belimbing Primary Health Center catchment area.

Table 2
Sociodemographic Characteristics of Respondents (N = 34)

Characteristic	n	%
Age (years)		
60-69 years	21	61.8
70-79 years	9	26.5
≥ 80 years	4	11.7
Sex		
Female	22	64.7

Characteristic	n	%
Male	12	35.3
Level of Education		
Higher Education	7	20.6
Senior/Junior High School	19	55.9
Primary School / No Formal Education	8	23.5
Total	34	100

Note: Mean age = 68.0 ± 8.63 years (see text above); Sub-district distribution: Belimbing (10), Anduring (8), Kuranji (7), Ampang (5), Pasar Ambacang (4).

3.2 Changes in Self-Efficacy Scores

Prior to the intervention, the mean GSE-10 score was 24.1 (SD = 4.5; range 14-31), classified within the moderate self-efficacy category. Following the two-week intervention, the mean score increased to 30.6 (SD = 3.8; range 22-39), reaching the high self-efficacy category (Table 3). The absolute gain of 6.5 points (representing a 27% improvement from baseline) indicates a clinically meaningful change.

Table 3.

Descriptive Statistics of GSE-10 Self-Efficacy Scores Before and After Intervention (N = 34)

Variable	N	Mean	SD	Min	Max
Pretest Self-Efficacy	34	24.1	4.5	14	31
Posttest Self-Efficacy	34	30.6	3.8	22	39
Change (Δ)		+6.5			

Note: GSE-10 score range = 10-40. Interpretation: 10-19 = low; 20-29 = moderate; 30-40 = high. Δ = difference between posttest and pretest mean scores.

3.3 Statistical Test Results

The Shapiro-Wilk test confirmed normal distribution of both pretest ($p = 0.124$) and posttest ($p = 0.218$) data. The paired sample t-test revealed a statistically significant difference between pretest and posttest self-efficacy scores (Table 4). Cohen's $d = 1.56$ indicated a large effect size according to Cohen's (1988) classification criteria. Power analysis confirmed a study power of 0.99, substantially exceeding the conventional threshold of 0.80.

Table 4

Paired Sample T-Test Results: Self-Efficacy Pretest vs. Posttest (N = 34)

Variable	Mean Difference	95% CI	t	df	p-value
Self-Efficacy Pre vs. Post	-6.5	[-8.1; -4.9]	-7.84	33	<0.001*

Note: *p < 0.001; CI = Confidence Interval; df = degrees of freedom; Cohen's d = 1.56 (large effect size).

Table 5
Power Analysis Results

Parameter	Value	Remarks
Effect Size (Cohen's d)	1.56	Large effect (> 0.8)
Alpha (α)	0.05	Level of significance
Power (1- β)	0.99	Highly adequate power (≥ 0.80)
Actual N	34	Exceeds minimum N (n = 12)

Note: Analysis performed using G*Power 3.1; large effect size (d > 0.8) per Cohen (1988) classification.

4.0 Discussion

4.1 Interpretation of Findings in Relation to Theory

The significant improvement in self-efficacy following the intervention (delta = 6.5 points; p < 0.001; Cohen's d = 1.56) can be theoretically explained within Bandura's (1997) social cognitive framework. The structured sessions systematically activated all four sources of self-efficacy: mastery experience through decision-making skill practice; vicarious learning through peer group discussions; verbal persuasion through facilitator reinforcement and positive feedback; and physiological/affective feedback through enhanced critical awareness of personal capacities.

Beyond these cognitive-behavioral mechanisms, the intervention's design also explicitly operationalized dimensions of Rowe and Kahn's (1997) successful aging framework: Session 1 (Control) and Session 4 (Access to Resources) targeted functional autonomy and active engagement, while Session 2 (Participation) and Session 3 (Critical Awareness) addressed psychological well-being and adaptive capacity. This dual theoretical grounding suggests that the observed self-efficacy gains may reflect not only cognitive-behavioral mastery processes but also a broader shift in participants' subjective appraisal of their own aging process (Sabatini, 2024), consistent with the increasingly recognized subjective dimension of successful aging. The shift in mean scores from the moderate category (24.1) to the high category (30.6) on the GSE-10 signifies a qualitative transition that extends beyond mere knowledge acquisition - participants demonstrated a fundamental change in their perception of personal capability. This process aligns with Zimmerman's (1995) proposition that intrapersonal empowerment directly reinforces self-efficacy through enhanced sense of control and autonomy.

4.2 Comparison with Previous Research

These findings are consistent with the meta-analytic results of Lopez *et al.* (2023), which demonstrated that empowerment-based interventions significantly improved self-efficacy

among older adults (SMD = 0.72; 95% CI [0.52, 0.92]). Chen *et al.* (2024) similarly reported significant self-efficacy improvements through an empowerment-based randomized controlled trial ($d = 0.89$). Comparable findings have also been reported in other developing-country primary care settings: Shahabi *et al.* (2024), in a randomized controlled trial conducted in Iran, demonstrated that a Pender's Health Promotion Model-based empowerment intervention significantly improved self-efficacy among older adults, although their protocol required six sessions for participants plus two additional family sessions. In comparison, the present study achieved a comparably meaningful improvement using a substantially shorter four-session, two-week protocol, suggesting that the structural focus and theoretical integration of an intervention - rather than its duration alone - may be a more decisive determinant of effectiveness in resource-constrained developing-country primary care settings such as Indonesian Puskesmas.

In contrast to the majority of prior studies employing extended 8-12 week intervention protocols (Kim & Park, 2022; Shahabi *et al.*, 2024), this study demonstrated that a structured brief intervention of two weeks was capable of producing significant effects with a large effect size. This finding supports the argument that the quality and structural integrity of intervention content constitutes an important determinant of effectiveness, with direct implications for the scalability of psychosocial interventions in resource-limited primary healthcare settings.

Nevertheless, the magnitude of the observed effect size ($d = 1.56$) exceeds that reported in the comparable trials cited above (SMD = 0.72 and $d = 0.89$, respectively) and should be interpreted with appropriate caution. Several methodological features of the one-group pretest-posttest design may have contributed to an inflated effect estimate, including the absence of a control group to account for regression to the mean, practice effects associated with repeated GSE-10 administration within a short two-week interval, and possible social desirability bias arising from the close facilitator-participant rapport built over four interactive group sessions. Cultural factors specific to the West Sumatran research setting may also be relevant: the Minangkabau cultural emphasis on communal support and collective problem-solving, together with the strong role of religious (Islamic) framing of resilience and patience in later life, may have reinforced participants' sense of mastery and social validation within the group-based intervention format in ways that may not fully generalize to more individualistic cultural contexts. Future controlled trials should examine whether cultural and contextual factors moderate the magnitude of empowerment-based intervention effects.

4.3 Novelty and Scientific Contribution

This study offers three potential contributions to the existing body of knowledge, which should be regarded as hypothesis-generating rather than confirmatory given the absence of a control group. First, it presents an original conceptual integration of the self-empowerment approach with the successful aging framework into a single intervention protocol - a combination not previously documented in the context of Indonesian primary healthcare services. Second, it provides preliminary empirical evidence that a brief (two-week), empowerment-based psychosocial intervention can generate a large effect size in older adult populations in a developing country context, thereby addressing the contextual research gap identified in the literature review. Third, the application of the standardized GSE-10 instrument with a score interpretation framework anchored to a 10-40 range provides a more methodologically robust foundation compared to similar Indonesian studies that have predominantly employed non-standardized, researcher-developed instruments. Because this conceptual integration was tested without a comparison condition, these contributions represent a promising foundation that

requires confirmation through randomized controlled trials before definitive claims of superiority or causal efficacy can be made.

4.4 Clinical and Policy Implications

Clinically, this intervention protocol demonstrates high implementation feasibility, given its brief duration, low cost, and delivery by trained nurses within existing primary care infrastructure. Integration into the established Posyandu Lansia framework represents a pragmatic and resource-efficient strategy that does not require substantial additional resource allocation.

From a policy perspective, these findings provide empirical justification for the Ministry of Health to expand the scope of elderly care programs beyond the dominant biomedical paradigm toward a more comprehensive biopsychosocial model. Revision of the Posyandu Lansia guidelines to incorporate structured, empowerment-based psychoeducation as a standard service component would be strategically aligned with the WHO Decade of Healthy Ageing 2020-2030 framework and the Indonesian Healthy Program (Program Indonesia Sehat).

Conclusion

The self-empowerment intervention, grounded in the successful aging framework, was associated with a statistically significant and large improvement in self-efficacy among older adults at the Belimbing Primary Health Center, Padang City ($t(33) = -7.84$; $p < 0.001$; Cohen's $d = 1.56$). The improvement in GSE-10 scores from the moderate category (mean = 24.1) to the high category (mean = 30.6) represents a meaningful change in older adults' self-belief and behavioral confidence. Given the single-group, non-controlled design, these findings should be regarded as preliminary and hypothesis-generating rather than confirmatory.

This brief, structured intervention model nonetheless demonstrates high potential for implementation across primary healthcare settings as a practical strategy for enhancing psychosocial independence and quality of aging. Future research employing randomized controlled trial (RCT) designs, larger and more diverse samples, multi-center settings, and longitudinal follow-up measurements is strongly recommended to establish causal inferences and generalizability of these findings.

Recommendations

A. Theoretical

Future research should expand the intervention model by incorporating additional mediating or moderating variables such as social support, quality of life, and mental health status to more comprehensively elucidate the mechanisms underlying self-efficacy enhancement in older adults.

B. Methodological

This study is constrained by the one-group pretest-posttest design without a control group, which precludes definitive causal inference. Subsequent research should employ more rigorous experimental designs, specifically randomized controlled trials with adequate sample sizes, to achieve higher levels of internal and external validity.

C. Clinical Practice

Healthcare practitioners, particularly nurses and community health workers in primary care settings, are encouraged to adopt this self-empowerment intervention as a component of

comprehensive elderly care programs, given its demonstrated preliminary effectiveness, efficiency, and feasibility of implementation.

D. Health Policy

Government authorities and healthcare policymakers are urged to expand the framework of elderly care programs beyond biomedical approaches to encompass a biopsychosocial model. Empowerment-based interventions such as those developed in this study should be considered as candidate evidence-based models for the formulation of primary care geriatric health service policies, pending confirmation through controlled trials.

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