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The Relationship Between Depression and Cognitive Function with the Level of Independence in Daily Living Activities Among Older Adults at Sabai Nan Aluih Sicincin

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Abstract

Older adults residing in nursing homes are a vulnerable group to mental health problems and cognitive decline, which affect their independence in daily living activities. Depression and cognitive impairment are important psychological factors that contribute to increased dependency among older adults. This study aims to analyze the relationship between depression and cognitive function and the level of independence in daily living activities among older adults at the Sabai Nan Aluih Sicincin Nursing Home. A quantitative study with a cross-sectional design was conducted among 80 older adults at the Sabai Nan Aluih Sicincin Nursing Home from November 2025 to January 2026, using a total sampling technique. The research instruments included the Geriatric Depression Scale (GDS-15), the Mini Mental State Examination (MMSE), and the Barthel Index. Data were analyzed using univariate and bivariate analyses with the chi-square test. The majority of the respondents were aged 60–74 years (73.8%), male (77.5%), and had a high school education (38.8%). Most respondents experienced mild depression (58.8%), mild cognitive impairment (67.5%), and were classified as having mild dependency (72.5%). Statistical analysis revealed a significant relationship between depression and the level of independence in daily living activities (p = 0.044), as well as between cognitive function and the level of independence in daily living activities among older adults (p = 0.024). Depression and cognitive function are significantly associated with the level of independence in daily living activities among older adults. Therefore, integrated intervention programs in nursing homes, including cognitive stimulation, structured physical activities, and continuous psychosocial support, are recommended to enhance older adults' independence.

Keywords: Cognitive Function, Depression, Independence, Older Adults.

INTRODUCTION

The increasing number of older adults is a global and national phenomenon that has led to a rise in health-related problems, one of which is a decline in independence in daily living activities (Astuti et al., 2024). The aging process causes physical, psychological, and social changes that interact with one another, thereby increasing the risk of dependency among older adults (Koulaee et al., 2024). Independence in daily living activities is an important indicator of quality of life in older adults, as it reflects an individual's ability to perform self-care independently (Aliyah et al., 2024).

Older adults residing in nursing homes are more vulnerable to depression due to limited family interaction and changes in their living environment (Khoirunnisa et al., 2025). In addition, limited

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mental and social stimulation may accelerate cognitive decline (Sujarwoto et al., 2025). Depression and cognitive impairment have been shown to play a significant role in reducing independence among older adults and increasing the need for long-term care (Westgård et al., 2025).

Although previous studies have established that depression and cognitive impairment individually contribute to functional decline, most research has examined these factors separately. What remains less understood is their combined effect, particularly in institutional settings. In nursing home contexts, these two conditions frequently co-occur and synergistically exacerbate dependence. Nursing home residents face a higher risk of depression due to limited family interaction and feelings of loneliness, while minimal environmental stimulation accelerates cognitive decline. The combination of these conditions leads to a faster loss of independence compared to older adults living in the community. Therefore, this study is necessary to provide a comprehensive analysis of how depression and cognitive function concurrently relate to the level of independence among institutionalized older adults, providing a vital evidence base for designing targeted, integrated interventions.

METHODS

Study Design
This study employed an analytical cross-sectional study design.

Research Setting and Period
This study was conducted at the Sabai Nan Aluih Sicincin Nursing Home from November 2025 to January 2026.

Sampling Technique and Sample Size
The study population consisted of the entire cohort of 110 older adults residing in the nursing home. A total sampling approach was utilized, meaning all 110 residents were initially evaluated for eligibility rather than selecting a random subset. Participants were included if they were aged over 60 years and expressed willingness to participate. To ensure consistency and eliminate redundancy, communication requirements were addressed solely through the exclusion criteria. Residents were excluded if they were unable to communicate effectively or if they had severe cognitive impairment, which was objectively determined by a Mini-Mental State Examination (MMSE) score of less than 17. Of the initial 110 residents, 30 individuals were excluded as they did not meet the eligibility criteria (presenting with severe cognitive impairment, inability to communicate effectively, or refusal to participate). Consequently, the final sample consisted of 80 eligible older adults.

Research Instruments
The independent variables were depression and cognitive function, while the dependent variable was the level of independence in daily living activities. Depression was measured using the Indonesian version of the 15-item Geriatric Depression Scale (GDS-15), which was previously validated by Pramesona & Taneepanichskul (2018) demonstrating good internal consistency (Cronbach's alpha = 0.80). Scores range from 0 to 15, with categorizations of no depression (0–4), mild depression (5–8), moderate depression (9–11), and severe depression (12–15). Cognitive function was assessed using the Indonesian version of the Mini-Mental State Examination (MMSE), validated by Kusnanto et al. (2016) with a Cronbach's alpha of 0.80. The MMSE scores range from 0 to 30, categorized into normal cognitive function (24–30), mild cognitive impairment (18–23), and severe cognitive impairment (< 17). Independence in daily living activities was measured using the Indonesian version of the Barthel Index, adapted and validated by Alifiar et al. (2025) showing excellent reliability (Cronbach's alpha = 0.89). The scores range from 0 to 20, categorized as total dependence (0–4), severe dependence (5–8), moderate dependence (9–11), mild dependence (12–19), and independent (20).

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Data Collection Procedures

The data collection procedure began with obtaining research approval from the educational institution, the Social Affairs Office of West Sumatra Province, and the management of the Sabai Nan Aluih Sicincin Nursing Home. Data were collected directly by the principal investigator and two trained enumerators. Prior to data collection, the enumerators received standardized training to align their understanding of the research objectives, data collection procedures, questionnaire administration, and research ethics. Respondents who met the inclusion criteria were provided with an explanation of the study and asked to sign an informed consent form. The GDS-15 and MMSE were administered through guided interviews, while the Barthel Index was completed using a combination of guided interviews and direct observation of the respondents' actual physical capabilities. Throughout the data collection process, the researchers ensured that respondents were comfortable.

Data Analysis

Data analysis was performed using univariate and bivariate analyses with the chi-square test, with a significance level set at $p < 0.05$. The analysis was conducted in two sequential stages. First, univariate analysis was utilized to describe the frequency distribution of the key variables, including depression, cognitive function, and the level of independence in daily living activities among older adults. Second, bivariate analysis employing the chi-square test was conducted to examine the relationships between depression and independence, as well as between cognitive function and independence among the older adults.

RESULTS

Univariate Analysis

The univariate analysis aimed to describe the frequency distribution of the respondents' sociodemographic characteristics and the primary clinical variables. The majority of the respondents were classified within the early elderly age group (60–74 years), predominantly male, and had mostly completed a high school level of education. Regarding the clinical variables, more than half of the older adults experienced mild depression and mild cognitive impairment. Consequently, the majority of the respondents were classified as having mild dependency, indicating that while they retain the ability to perform basic daily tasks, they still require minimal assistance for certain activities. The complete sociodemographic and clinical characteristics of the participants are presented in Table 1:

Table 1. Sociodemographic and Clinical Characteristics of Respondents (n = 80)

Variables	Frequency (f)	Percentage (%)
Age		
60-74 Years	59	73.8
75-90 Years	21	26.3
Sex		
Male	62	77.5
Female	18	22.5
Education Level		
No School	1	1.3
Elementary School	16	20.0
Junior High School	27	33.8
Senior High School	31	38.8
Higher Education	5	6.3
Level of Independence		
Independent	19	23.8
Mild Dependency	58	72.5
Moderate Dependency	3	3.8
Depression Level		
No Depression	27	33.8
Mild Depression	47	58.8
Moderate Depression	6	7.5
Cognitive Function		
Normal Cognitive Function	26	32.5
Mild Cognitive Impairment	54	67.5

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Bivariate Analysis

Bivariate analysis aimed to determine the relationships between depression and the level of independence, as well as between cognitive function and the level of independence among older adults residing at the Sabai Nan Aluih Sicincin Nursing Home. The cross-tabulation results demonstrated that regardless of their depression status or cognitive function, the majority of respondents consistently fell into the mild dependency category. The detailed results of the bivariate analysis are presented in Table 2.

Relationship Between Depression and the Level of Independence in Daily Living Activities Among Older Adults

Based on Table 2, respondents without depression were mostly classified as having mild dependency, with 15 individuals (55.6%). Among respondents with mild depression, almost all were categorized as having mild dependency, totaling 39 individuals (83.0%). Meanwhile, among respondents with moderate depression, the majority were also classified as having mild dependency, with 4 individuals (66.7%). The results of the chi-square test showed a p-value of 0.044 ($p < 0.05$), indicating a significant relationship between depression and the level of independence in daily living activities among older adults at the Sabai Nan Aluih Sicincin Nursing Home.

Table 2. Relationship Between Depression, Cognitive Function, and Level of Independence (n = 80)

Variables	Independent f (%)	Mild Dependency f (%)	Moderate Dependency f (%)	Total f (%)	p-value
Depression					**0.044***
No Depression	11 (40.7%)	15 (55.6%)	1 (3.7%)	27 (100%)	
Mild Depression	7 (14.9%)	39 (83.0%)	1 (2.1%)	47 (100%)	
Moderate Depression	1 (16.7%)	4 (66.7%)	1 (16.7%)	6 (100%)	
Cognitive Function					**0.024***
Normal Function	11 (42.3%)	14 (53.8%)	1 (3.8%)	26 (100%)	
Mild Impairment	8 (14.8%)	44 (81.5%)	2 (3.7%)	54 (100%)	

*Significant at $p < 0.05$ using Chi-Square test.

Based on Table 2, respondents with normal cognitive function were mostly classified as having mild dependency, with 14 individuals (53.8%). Meanwhile, among respondents with mild cognitive impairment, almost all were categorized as having mild dependency, totalling 44 individuals (81.5%). The results of the chi-square test showed a p-value of 0.024. Since $p < 0.05$, it can be concluded that there is a significant relationship between cognitive function and the level of independence in daily living activities among older adults at the Sabai Nan Aluih Sicincin Nursing Home.

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DISCUSSION

Relationship Between Depression and the Level of Independence in Daily Living Activities Among Older Adults

The results of the chi-square test indicated a significant relationship between depression and the level of independence in daily living activities among older adults at the Sabai Nan Aluih Sicincin

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Nursing Home (p = 0.044). This finding is consistent with the study by Sawang et al. (2025), which reported that increased depressive symptoms are associated with decreased independence among older adults. However, this result contrasts with the findings of Yan and Li (2025), who stated that depression is not always directly related to the ability to perform daily activities among older adults residing in institutions with structured care systems and routine support from healthcare providers, suggesting the influence of factors beyond psychological aspects.

The mechanisms underlying this relationship can be explained through the psychophysiological impacts of depression. Depressive symptoms directly diminish an older adult's motivation, energy, and initiative to perform self-care and participate in daily activities. Pathophysiologically, depression involves a decrease in essential neurotransmitters such as serotonin and dopamine, leading to persistent fatigue, sleep disturbances, and a profound loss of interest. Consequently, older adults with depression become reluctant to engage in physical activities, which in turn accelerates muscle weakness and decreases their physical capacity to independently execute essential tasks like bathing or dressing. Furthermore, according to the Selection, Optimization, and Compensation (SOC) theory, older adults who lack adaptive coping mechanisms due to depression are more likely to experience a loss of meaning in life, reinforcing feelings of helplessness and leading to higher physical dependency.

In addition, the results showed that 16.7% of older adults with moderate depression were still classified as independent. This condition may be explained by the presence of protective factors, such as relatively good physical abilities, preserved cognitive function, and adequate social support, indicating that the impact of depression on independence is not always direct or absolute.

The Relationship Between Cognitive Function and the Level of Independence in Elderly Daily Activities

The chi-square test results indicated a statistically significant relationship between cognitive function and the level of independence in daily activities among the elderly at PSTW Sabai Nan Aluih Sicincin (p = 0.024). This finding aligns with the study by Adiningsih et al. (2022), which reported a relationship between cognitive function and elderly independence. However, this result differs from the study by Zahroh et al. (2024), which did not find a significant relationship between cognitive function and independence (p = 0.683), possibly due to differences in respondent characteristics and research settings.

Cognitive function is integral to autonomy because cognitive impairment significantly disrupts the brain's executive functions, which are critical for planning, initiating, sequencing, and safely performing daily activities. Memory loss, decreased attention spans, and disorientation can cause older adults to forget the proper sequence of tasks—such as using the toilet or preparing meals—and impair their ability to recognize familiar objects or respond to environmental stimuli safely. Conversely, based on the Cognitive Reserve Model, older adults with higher cognitive reserve can effectively understand instructions, solve simple problems, and recall activity sequences, thereby maintaining their functional independence longer despite neurodegenerative changes.

Although a significant relationship exists, the study results show that normal cognitive function does not always correspond to full independence. Most elderly individuals with normal cognitive function fell into the category of mild dependency (53.8%). This indicates that functional independence is a multidimensional construct. Independence is not solely dictated by cognitive intactness but is also heavily constrained by mechanical and physical limitations, such as decreased stamina, muscle weakness, sensory impairments, and comorbid chronic diseases (e.g., rheumatism or diabetes). These physical barriers can limit physical execution and necessitate mild assistance even when the cognitive capacity to plan and initiate the task remains fully intact.

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Implications for Nursing Practice

These findings have direct and significant implications for nursing practice, particularly within institutional settings. The strong association between cognitive/psychological factors and functional independence highlights the necessity of implementing routine screening programs for depressive symptoms (e.g., using the GDS-15) and cognitive decline (e.g., using the MMSE). Such early detection mechanisms can assist gerontological nurses in rapidly identifying older adults who are at a high risk of losing their functional independence. By understanding an individual's specific cognitive and affective status, nurses can plan and deliver targeted, individualized nursing interventions. These evidence-based interventions may include cognitive stimulation therapies (e.g., puzzle therapy or reminiscence therapy), structured physical group exercises, and continuous psychosocial support, all of which synergistically aim to mitigate depressive symptoms, preserve cognitive reserves, and ultimately enhance the older adults' autonomy and quality of life.

CONCLUSION

The majority of elderly residents at PSTW Sabai Nan Aluih Sicincin were classified as mildly dependent (72.5%), with most experiencing mild depression (58.8%) and mild cognitive impairment (67.5%). The analysis results showed a significant relationship between depression and the level of independence in daily activities among the elderly (p = 0.044), as well as between cognitive function and the level of independence in daily activities (p = 0.024). Elderly individuals with higher levels of depression and declining cognitive function tended to have lower independence in performing daily activities.

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