BKM Public Health & Community Medicine
Berita Kedokteran Masyarakat

Volume 41 **Number** 4, 2025, **Pages** e19266
DOI: 10.22146/bkm.v41i04.19266

Depression as a predominant factor for activities of daily living among elderly

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Submitted:
January 10th, 2024
Accepted:
April 15th, 2025
Published:
April 30th, 2025

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Abstract

Purpose: This study aims to provide an overview of the ability to perform activities of daily living (ADL) in the elderly population and to identify associated factors. **Methods:** A cross-sectional study was conducted with 100 community-dwelling participants aged 60 and older in West Jakarta. Sociodemographic data, the Barthel Index, the Berg Balance Scale, the Fried Frailty Index, and the Geriatric Depression Scale were collected by interview. Chi-Square and multiple logistic regression analyses were used for the bivariate and multivariate analyses. **Results:** The majority of participants were women (71%), aged 60-74 years (75%), with education levels of 12 years or more (90%). Fifteen percent of elderly participants experienced problems with ADL. Chi-square analysis showed significant associations between ADL impairment with age (p=0.006; OR=4.57; 95%CI: 1.454-14.368), balance (p=0.023; OR=10.38; 95%CI: 1.567-68.595), and depression (p=0.006; OR=5.00; 95%CI: 1.468-17.033). Multiple logistic regression analysis identified depression as the most dominant risk factor affecting ADL, increasing the risk by 4.02 times. **Conclusion:** This study highlights age, body balance, and depression as potential contributors to ADL impairment, with depression emerging as the predominant risk factor. Both physical and mental health should be considered essential for preserving ADL function in the elderly.

Keywords: activities of daily living; depression; elderly

INTRODUCTION

The global increase in the elderly population has triggered concerns related to degenerative diseases, morbidity, and functional decline. According to the World Health Organization, the number of individuals aged 60 and older reached 1.4 million in 2020 and is projected to account for 22% of the global population by 2050 [1]. In Indonesia, the elderly make up approximately 7% of the total population [2]. This demographic shift is accompanied by an increase in both physical and mental health problems, which can compromise the overall quality of life among older adults [3].

Disability is a major concern in the elderly and is often reflected through difficulties in performing activities of daily living (ADL) and instrumental activities of daily living (IADL) [3]. The World Report on Disability reports that nearly 45% of older adults worldwide face challenges in daily activities, and data from the Indonesian Family Life Survey-5 (IFLS-5) reveal that 32.1% of the elderly in Indonesia experience disabilities in ADL and/or IADL [4]. Maintaining the ability to perform daily activities independently is critical to sustaining a high quality of life and avoiding increased dependency on others.

Several factors contribute to the decline in ADL function among the elderly, including physical health, mental status, and social support. Depression plays a crucial role in this decline. The ability to perform daily activities requires mood stability, enthusiasm, and motivation, which can diminish significantly in individuals experiencing depression [5]. Although depression is not a direct consequence of aging, the elderly are particularly vulnerable due to biological, psychological, and social changes associated with aging [6,7].

From a biological perspective, aging is associated with a higher burden of diseases, neurological impairments, and changes in brain structure and function that may predispose individuals to depression [7]. Social isolation, loss of loved ones, economic insecurity, and the burden of chronic illness further increase the risk of developing depression in this population [6]. Depression, if unrecognized and untreated, can substantially impair an elderly person's motivation and ability to engage in daily activities, thereby leading to functional decline.

Physical decline also plays a significant role in ADL impairment. Normal aging processes result in accumulated cellular damage, central nervous system deterioration, muscle atrophy, and loss of balance control [8–10]. These physiological changes contribute to mobility impairments, frailty, falls, and increased risk of disability. The interplay between physical frailty, impaired balance, and mental health issues such as depression can create a vicious cycle that exacerbates functional decline.

Prior studies have shown high rates of depression (11.2%), frailty (25.2%), and falls (29.0%) among elderly populations [7,11,12]. Each of these factors has the potential to impact daily functioning through complex pathways involving psychological, neurological, and musculoskeletal systems. Experiencing a disability restricts productivity and poses a survival challenge, particularly for the elderly, whose bodily functions have declined. Functional decline limits personal independence and burdens families, caregivers, and healthcare systems [1].

Although various studies have explored the relationship between depression and ADL, the findings remain inconclusive. In particular, research in Indonesia—especially among community-dwelling elderly populations—remains scarce. Furthermore, existing studies often lack comprehensive multivariate analyses to identify the most dominant contributing factors. Therefore, this study aims to assess the ability of elderly individuals to perform activities of daily living and to identify the main contributing factors.

METHODS

This cross-sectional study was conducted among community-dwelling elderly individuals in West Jakarta between April and May 2023. The Faculty of Medicine and Health Science, Atma Jaya Catholic University of Indonesia Ethical Committee (No. 07/05/KEP-FKIKUAJ/2023) approved the study.

The study included a total of 100 elderly individuals aged 60 years and older who were living independently in the community. Participants were recruited through direct interviews conducted in West Jakarta. The inclusion criteria were being aged 60 years or older, residing in the West Jakarta area, able to communicate verbally, and willing to participate by providing informed consent. Participants were excluded if they had hearing or visual impairments that could interfere with the interview process or had been previously diagnosed with severe cognitive impairments or conditions affecting communication abilities. These criteria were applied to ensure accurate data collection and reliable interview responses.

The dependent variable in this study was the ability to perform daily living activities, which was assessed using the Barthel Index. ADL function was categorized as independent or dependent based on the total score, with a lower score indicating greater dependency [13]. The independent variables included sociodemographic factors (age, gender, education level), physical health indicators (body balance, frailty status), and mental health status (depression). Age was divided into 60–74 years and ≥75 years. Gender was categorized as male or female, and education level as less than 12 years and 12 years or more. Body balance was evaluated using the Berg Balance Scale, with scores of 40 or lower indicating impairment [14]. Frailty was measured using the Fried Frailty Index, based on five criteria: unintentional weight loss, weakness, exhaustion, slow gait, and low physical activity [15]. Depression was assessed using the 15-item Geriatric Depression Scale (GDS-15), with a cutoff score of 5 or more indicating depression [16].

Data collection was conducted through structured interviews utilizing validated questionnaires. Sociodemographic information (age, gender, and education level) was collected at the beginning of the interview. Following this, the Barthel Index, Berg Balance Scale, Fried Frailty Index, and Geriatric Depression Scale were administered sequentially to assess the participants' physical and mental health status.

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 23.0. Uni-

-variate analysis was conducted to describe the distribution of sociodemographic and clinical variables among the participants. The bivariate analysis examined associations between independent variables and ADL status using the Chi-square test. Odds ratios (OR) and 95% confidence intervals (CI) were calculated to measure the strength of associations, with a p-value less than 0.05 considered statistically significant. Variables with a p-value below 0.25 in the bivariate analysis were subsequently included in the multivariate analysis using Multiple Logistic Regression. A stepwise backward conditional method was employed to identify the most significant factors associated with ADL impairment, ensuring a parsimonious and accurate final model.

RESULTS

Table 1 presents the demographic and clinical characteristics of the elderly participants alongside their ADL status. Most participants maintained independence in performing daily activities, with the majority being younger seniors aged 60–74 years, female, and possessing higher educational attainment. Physical assessments indicated that normal body balance was common, although a notable proportion of the participants were identified as frail. While most participants did not exhibit depressive symptoms, depression, along with advanced age and impaired body balance, showed significant associations with ADL impairment in the bivariate analysis. In contrast, gender, education level, and frailty status were not significantly related to ADL outcomes, suggesting that psychological and physical factors, rather than demographic attributes, play a more critical role in influencing functional independence among the elderly.

Table 1. Characteristics of respondents (n=100)

Variables	n	%
Activities of daily living		
Independent	85	85
Dependent	15	15
Age (years)		
60-74	75	75
≥75	25	25
Gender		
Male	29	29
Female	71	71
Education (years)		
≥12	90	90
<12	10	10
Body balance		
Normal	95	95
Impaired	5	5
Frailty		
Non-frail	25	25
Frail	75	75
Depression		
Normal	84	84
Depression	16	16

Bivariate analysis in Table 2 examines associations between participant characteristics and ADL impairment. The results reveal that older age, impaired body balance, and the presence of depression were significantly linked to an increased risk of functional decline. Participants aged 75 years and above, those with impaired body balance, and individuals experiencing depressive symptoms demonstrated a higher likelihood of dependency in daily activities.

Table 2. Factors associated with ADL

Variables	Activities of daily living				*p*	OR (95%CI)
	Independent		Dependent			
	n	%	n	%		
Age (years)						
60-74	68	80.0	7	46.7	0.006*	4.57 (1.454-14.368)
≥75	17	20.0	8	53.3		
Gender						
Male	24	28.2	5	33.3	0.688	0.79 (0.244-2.542)
Female	61	71.8	10	66.7		
Education (years)						
≥12	77	90.6	13	86.7	0.643	1.48 (0.282-7.766)
<12	8	9.4	2	13.3		
Body balance						
Normal	83	97.6	12	80.0	0.023*	10.38 (1.569-68.595)
Impaired	2	2.4	3	20.0		
Frailty						
Non-frail	23	27.1	2	13.3	0.344	2.41 (0.505-11.518)
Frail	62	72.9	13	86.7		
Depression						
Normal	75	88.2	9	60.0	0.006*	5.00 (1.468-17.033)
Depression	10	11.8	6	40.0		

*p<0.05 (statistically significant); OR = odds ratio; 95%CI = 95% confidence interval

Meanwhile, gender, educational attainment, and frailty status did not show significant associations with ADL impairment, indicating that age, balance, and mental health status were the primary contributors to functional limitations among the elderly population studied.

Table 3 presents the findings from the multivariate analysis identifying the most influential predictors of ADL impairment. After adjusting for confounding variables, depression emerged as the dominant factor, with individuals experiencing depressive symptoms facing a markedly increased risk of functional dependence. Older age also remained significantly associated with ADL impairment, although its impact was slightly less pronounced compared to depression. These results underscore the crucial role of mental health in maintaining functional independence among older adults and highlight the need for early identification and management of depressive symptoms to prevent disability.

Table 3. Multivariate analysis

Variables	p	OR (95%CI)
Age	0.028*	3.81 (1.160-12.539)
Depression	0.034*	4.02 (1.112-14.507)

*p<0.05 (statistically significant)

DISCUSSION

Indonesia's increasing life expectancy, reaching 74.15 years in 2024, has contributed to a growing elderly population facing greater risks of morbidity and functional decline [17]. This study found that depression was the predominant factor associated with activities of daily living (ADL) impairment, followed by older age and impaired body balance. In contrast, gender, education level, and frailty status were not significantly associated with ADL impairment among the participants.

Although depression is not a direct consequence of aging, elderly individuals are more vulnerable to depressive symptoms due to physiological, psychological, and social changes [6]. Based on the 2023 Indonesian Health Survey, depression affected 4.7% of Indonesians aged 55 years and older, with higher rates among those aged 75 years and above and those living in urban areas [18]. Depression among the elderly often stems from the cumulative burden of chronic diseases, social isolation, and economic challenges, leading to impaired motivation and reduced participation in daily activities [6].

Gender differences in depression prevalence are well established. Women are more susceptible to depression due to hormonal factors affecting serotonin regulation and greater exposure to caregiving and sociocultural stressors [19]. In this study, the higher proportion of female participants may have influenced the strong association found between depression and ADL impairment. Similar findings have been reported by Mohamadzadeh et al., who observed a significant relationship between depression and functional decline in older adults [5]. Specific domains of daily living, particularly toileting activities, appear to be particularly sensitive to depressive symptoms, as also suggested by Han et al. [20].

Physiological aging also affects balance and mobility. Declines in the central and peripheral nervous systems impair sensory integration and postural stability, making the elderly more prone to falls and mobility limitations [21,22]. As found in this study, impaired body balance further reduces independence in performing daily activities. These findings are consistent with previous research that highlighted the impact of aging on multiple domains of daily functioning [3]. However, in contrast to prior longitudinal studies [23], our study did not find significant associations between gender, education level, or frailty status and ADL impairment. Differences in methodology, sample characteristics, and cultural contexts may explain these variations.

Recognizing depression as a predominant factor influencing ADL emphasizes the need for integrating mental health screenings and interventions into community-based elderly care. Programs to improve mood, social interaction, and access to mental health services may contribute significantly to maintaining functional independence. Screening programs for depression and balance impairment should be routinely implemented in primary care and community health services. Early intervention focusing on mental well-being, mobility training, and enhancement of social support could significantly delay or prevent functional decline, thereby reducing the societal and healthcare burden.

Nonetheless, this study has certain limitations. The use of self-reported data may introduce bias, particularly in sensitive issues like depression, where stigma may lead to underreporting. Additionally, the cross-sectional design limits our ability to draw causal inferences between depression and ADL impairment. Future longitudinal studies are needed to understand the directionality of this relationship.

CONCLUSION

This study highlights that depression plays a major role in impairing ADL among the elderly, followed by advancing age and impaired body balance. The presence of depressive symptoms significantly increased the risk of functional decline, emphasizing the critical impact of mental health on maintaining independence in older adults. Although physical aging and balance deterioration contribute to ADL impairment, psychological factors emerged as the most dominant in this study.

The findings underline the importance of incorporating mental health screenings into elderly care programs, with a particular focus on early detection and treatment of depression. However, limitations such as reliance on self-reported data and the cross-sectional design, which restricts causal inference, warrant further research. Longitudinal cohort studies are recommended to better explore the directionality and causality of depression and other contributing factors to ADL impairment.

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