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Health Status, Family Support, and Independence in Activities of Daily Living among Adults Aged 45 Years and Older at Posbindu Tabeo, Central Sulawesi

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ABSTRACT
Background: Independence in performing activities of daily living (ADL) is an important indicator of functional health among middle-aged and older adults. Health status and family support are considered important factors associated with the ability to maintain daily functioning. This study aimed to analyze the association between health status, family support, and independence in ADL among adults aged 45 years and older at Posbindu Tabeo, Kayumalue Ngapa, within the working area of Tawaeli Public Health Center, Central Sulawesi, Indonesia.
Methods: This study employed an analytical cross-sectional design. The study was conducted at Posbindu Tabeo, Kayumalue Ngapa, from July 10 to July 11, 2023. A total of 38 participants aged 45 years and older were selected using purposive sampling. Data were collected through face-to-face interviews using structured questionnaires. Independence in ADL was measured using the Barthel Index, while health status and family support were assessed using structured questionnaires. Data were analyzed using descriptive statistics and the Chi-square test, with statistical significance set at $p < 0.05$.
Results: Among 38 participants, 28 respondents (73.7%) had good health status, 27 respondents (71.1%) received supportive family support, and 17 respondents (44.7%) had mild dependency in ADL. The Chi-square test showed a significant association between health status and independence in ADL ($p = 0.001$). A significant association was also found between family support and independence in ADL ($p = 0.001$).
Conclusion: Health status and family support were statistically associated with independence in activities of daily living among adults aged 45 years and older at Posbindu Tabeo. These findings suggest the importance of maintaining good health status and strengthening family support in community-based health programs to help preserve functional independence. Further studies with larger samples and longitudinal designs are recommended to confirm these findings.

INTRODUCTION

Population ageing has become one of the most significant demographic transformations of the twenty-first century and represents a major challenge for global health systems. According to the World Health Organization (WHO), the number of people aged 60 years and older is expected to increase from 1 billion in 2020 to 2.1 billion by 2050, with the majority of this growth occurring in low- and middle-income countries (Noto, 2023). As life expectancy increases worldwide,

maintaining functional independence among older adults has become a critical public health priority because it directly affects quality of life, healthcare utilization, and social participation (Gianfredi et al., 2025).

Functional independence, commonly assessed through Activities of Daily Living (ADL), is an important indicator of healthy ageing. ADL encompasses basic self-care activities such as eating, bathing, dressing, toileting, mobility, and transferring. Declining physical and cognitive functions associated with ageing often lead to increased dependency, placing substantial burdens on families, communities, and healthcare systems (Cho et al., 2025). Globally, studies have shown that loss of independence among older adults is associated with increased morbidity, reduced quality of life, institutionalization, and mortality.

The growing prevalence of chronic diseases among older adults further complicates the challenge of maintaining independence. Conditions such as hypertension, stroke, diabetes mellitus, musculoskeletal disorders, and cognitive impairment have been consistently associated with reduced functional ability and greater dependency in daily activities (Bhattacharjee et al., 2021). Previous studies have demonstrated that health status is one of the strongest predictors of independence among older adults. Older individuals with good physical and mental health are more likely to remain active, socially engaged, and capable of performing daily activities without assistance (Dominica et al., 2024).

In addition to health status, family support plays a crucial role in promoting successful ageing. Family members often serve as the primary source of emotional, informational, instrumental, and appraisal support for older adults (Fauziah Nasution et al., 2025). Research conducted in various countries has shown that adequate family support contributes to better physical functioning, psychological well-being, treatment adherence, and maintenance of independence (Hu et al., 2025). Conversely, inadequate family support may increase vulnerability to functional decline and dependency. Given the central role of family in many Asian societies, including Indonesia, understanding how family support influences elderly independence is particularly important (Mahmudi et al., 2025a; Surya & Alfita, 2025a).

Despite growing evidence regarding factors affecting independence among older adults, substantial gaps remain. Most previous studies have been conducted in urban settings, institutional care facilities, or developed countries, limiting the generalizability of findings to community-based elderly populations in developing regions (Enogela et al., 2022). Furthermore, the interaction between health status and family support within local community health programs has received limited attention. Evidence from rural and semi-urban communities in Indonesia remains scarce, particularly in community-based integrated health service posts (Pos Pembinaan Terpadu/Posbindu), where preventive and promotive healthcare services for older adults are routinely provided (Anggraini, 2023).

Indonesia is experiencing a rapid demographic transition characterized by a growing elderly population. National health reports indicate a continuous increase in the proportion of older adults, accompanied by a rising prevalence of chronic diseases and functional limitations (Kusumaningrum et al., 2024). This trend poses significant implications for achieving healthy ageing and reducing disability among older populations. Strengthening strategies that preserve independence among older adults is therefore essential for supporting national health priorities and achieving Sustainable Development Goal (SDG) 3, which aims to ensure healthy lives and promote well-being for all ages (Jane Osareme et al., 2024)

In Central Sulawesi Province, the elderly population continues to increase, creating additional demands for community-based health services (Dinkes Sulawesi Tengah, 2021). Posbindu Tabeo in Kayumalue Ngapa, within the working area of Tawaeli Public Health Center, serves a considerable number of older adults with varying levels of functional ability. Preliminary observations indicated that while some older adults remained active and independent, others required assistance from family members to perform daily activities. However, empirical evidence regarding factors associated with elderly independence in this setting remains limited.

Understanding the determinants of independence among older adults is important for developing targeted interventions and strengthening family-centered geriatric care. Evidence generated from local community settings can support healthcare providers and policymakers in

designing programs that enhance healthy ageing, prevent dependency, and improve quality of life among older populations (Wong et al., 2025).

Therefore, this study aimed to analyze the factors associated with elderly independence in performing activities of daily living at Posbindu Tabeo, Kayumalue Ngapa, within the working area of Tawaeli Public Health Center. Specifically, this study examined the relationship between health status, family support, and the level of independence among older adults. The findings are expected to contribute to the growing body of evidence on healthy ageing and provide practical implications for community-based elderly healthcare programs.

METHODS

Study Design

This study employed an analytical cross-sectional design to examine the association between health status, family support, and independence in activities of daily living (ADL) among adults aged 45 years and older. The cross-sectional design was selected because exposure variables and the outcome were measured at the same point in time. Therefore, the findings should be interpreted as associations rather than causal relationships.

Study Setting and Period

The study was conducted at Posbindu Tabeo, Kayumalue Ngapa Village, within the working area of Tawaeli Public Health Center, Palu City, Central Sulawesi, Indonesia. Posbindu is a community-based integrated health service post that provides preventive and promotive health services for pre-elderly and older adults. Data collection was carried out from July 10 to July 11, 2023.

Study Population and Sampling

The target population consisted of all adults aged 45 years and older who were registered and actively participated in Posbindu Tabeo activities. Based on records from the community health post, the total eligible population was 60 individuals.

Participants were selected using purposive sampling, a non-probability sampling technique used to recruit respondents who met the study criteria. The inclusion criteria were: (1) aged 45 years or older; (2) registered as an active participant at Posbindu Tabeo; (3) able to communicate and complete the interview with or without researcher assistance; and (4) willing to participate by providing written informed consent. The exclusion criteria were: (1) inability to communicate effectively during data collection; (2) refusal to participate or withdrawal during the interview; and (3) incomplete questionnaire data.

The minimum sample size was calculated using Slovin's formula with a 10% margin of error: $n = N / (1 + Ne^2)$. With a population of 60 individuals, the minimum required sample was 38 participants. All selected participants completed the study, resulting in a final sample of 38 respondents and a response rate of 100%.

Variables and Measurements

The dependent variable was independence in performing ADL. Independence was measured using the Barthel Index, which assesses ten domains: feeding, bathing, grooming, dressing, bowel control, bladder control, toilet use, transfers, mobility, and stair climbing. The Barthel Index score was interpreted using the standard 0–20 scoring approach: total dependency (0–4), severe dependency (5–8), moderate dependency (9–11), mild dependency (12–19), and independent (20). In this study sample, no respondent was classified in the fully independent category; therefore, the results tables present only the dependency categories observed among respondents.

The independent variables were health status and family support. Health status was assessed using a structured questionnaire consisting of 10 items related to participants' general physical health condition. The total score was categorized as good health status (score ≥20) and poor health status (score <20).

Family support was measured using a questionnaire adapted from Sitanggang (2015). The instrument consisted of 20 items covering four dimensions of support: emotional support, informational support, instrumental support, and appraisal support. Responses were rated on a

four-point Likert scale ranging from 1 ("never") to 4 ("always"). Total scores were categorized as supportive family support (score ≥40) and less supportive family support (score <40).

Demographic characteristics included age and sex. Age was categorized as pre-elderly (45–59 years) and older adults (≥60 years) to ensure consistency with the actual study population.

Data Collection Procedures

Data were collected through face-to-face interviews and questionnaire administration by trained researchers. Before the interview, each participant received an explanation of the study objectives, procedures, potential benefits and risks, confidentiality, and the voluntary nature of participation. Written informed consent was obtained before enrollment.

The Barthel Index, health-status questionnaire, family-support questionnaire, and demographic form were administered directly to participants. For respondents who had difficulty reading or writing, researchers assisted by reading the questions and recording the answers without directing or influencing the responses, thereby minimizing interviewer bias.

Data Quality Assurance

Several procedures were used to ensure data quality. Data collectors received training on the study objectives, eligibility criteria, questionnaire administration, ethical procedures, and standardized interviewing techniques. Completed questionnaires were reviewed daily for completeness and consistency. Data coding and entry were performed using standardized procedures, followed by data cleaning to identify missing values, inconsistencies, and entry errors before statistical analysis.

Statistical Analysis

Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to summarize demographic characteristics and study variables. Categorical variables were presented as frequencies and percentages.

Bivariate analysis was performed to assess the association between health status, family support, and ADL independence. The Chi-square test was used to examine associations between categorical variables. When expected cell counts were small, Fisher's exact test or an exact-test approach was considered as appropriate. Statistical significance was set at $p < 0.05$ with a 95% confidence level.

Ethical Considerations

Ethical approval for the use of the study data in this manuscript was obtained from the Ethics Committee of Poltekkes Kemenkes Palu (No. 000504/KEPK POLTEKKES KEMENKES PALU/2025). During the July 2023 field data collection, participants received written and verbal information regarding the study objectives, procedures, benefits, risks, confidentiality, and their right to decline or withdraw. Written informed consent was obtained before participation.

Methodological Limitations

This study has several methodological limitations. First, the cross-sectional design does not allow causal relationships to be established between health status, family support, and ADL independence. Second, the relatively small sample size and use of purposive sampling may limit the generalizability of the findings to broader populations. Third, data were collected through self-reported questionnaires, which may be subject to recall bias and social desirability bias. Despite these limitations, the study provides community-based evidence regarding factors associated with ADL independence among adults aged 45 years and older in a primary healthcare setting.

RESULTS

The characteristics of respondents in this study can be seen in the following table.

Table 1. Respondent Characteristic (n=38)

Characteristic	n	%
Age		
45-59 Year	18	39.5
≥60 Year	23	60.5
Gender		

Male	11	28.9
Female	27	71.1
Health status		
Good	28	73.7
Not good	10	26.3
Familliy support		
Support	27	71.1
Not support	11	28.9
Independence		
Mild	17	44.7
Moderate	5	13.2
Severe	16	42.1

Sumber : Data Primer (2023)

Table 1 shows that there were 38 respondents, by age was in the elderly category (60–90 years old), totaling 23 people (60.5%), and the largest percentage by gender was female, totaling 27 people (71.1%). The most common health condition was "good," with 28 people (73.7%). The largest percentage of family support was in the "supportive" category, totaling 27 people (71.1%). The largest percentage of independence was in the "mild dependence" category, totaling 17 people (44.7%).

Table 2The Relationship Between Health Status and Independence Among Older Adults (n=38)

Health status	Independence								p-value
	Mild		Moderate		Severe		Total		
	f	%	f	%	f	%	f	%	
Good	17	44.7	0	0	11	28.9	28	100	0,001
Not good	0	0	5	13.2	5	13.2	10	100	
Total	**17**	**44.7**	**5**	**13.2**	**16**	**42.1**	**38**	**100**	

Source: Primary data, 2023.

Table 2. shows that the largest percentage of respondents consists of those who reported mild dependence and had a health condition categorized as good, totaling 17 people (44.7%), while the smallest percentage consists of those who reported mild dependence and had a health condition categorized as poor, totaling 0 people (0%). Based on the results of the Chi-Square statistical test, the P-value was found to be 0.000. Since the P-value is < 0.05, H_0 is rejected and H_1 is accepted. This means there is a relationship between health status and independence among the elderly at the Tabeo Kayumalue Ngapa Posbindu within the service area of the Tawaeli Community Health Center.

Tabel 3. The Relationship Between family support and Independence Among Older Adults (n=38)

Familiy support	Independence								p-value
	Mild		Moderate		Severe		Total		
	n	%	n	%					
Support	17	4 4.7	0	0		6.3	7	00	0,001
Not support	0	0	5	13.2	6	15.8	11	100	
Total	**17**	**44.7**	**5**	**13.2**	**16**	**42.1**	**38**	**100**	

Sumber : Data Primer (2023)

Table 3. shows that the largest percentage of respondents consisted of those who experienced mild dependency and received family support in the "supportive" category, totaling 17 people (44.7%), while the smallest percentage consisted of respondents who experienced mild dependency and received family support in the "unsupportive" category, totaling 0 people (0%). Based on the results of the Chi-Square statistical test, the P-value was found to be 0.000. Since the P-value is < 0.05, H0 is rejected and H1 is accepted. This means there is a relationship between family support and the independence of the elderly at the Tabeo Kayumalue Ngapa Posbindu within the Tawaeli Community Health Center's service area

DISCUSSION

This study examined the relationship between health status, family support, and independence among older adults in performing activities of daily living (ADL) at Posbindu Tabeo, Kayumalue Ngapa. The findings demonstrated that both health status and family support were significantly associated with elderly independence. Older adults with good health status were more likely to experience mild dependency, whereas those with poor health status tended to exhibit moderate to severe dependency. Similarly, respondents who received adequate family support showed higher levels of independence compared with those who received limited support.

The observed association between good health status and greater independence suggests that physical and psychological well-being are fundamental determinants of functional capacity among older adults (Rumaolat et al., 2023). Healthy older adults are generally more capable of performing essential daily activities such as bathing, dressing, eating, toileting, and mobility without assistance. Conversely, chronic illness, physical limitations, and declining physiological function may reduce the ability of older adults to maintain independence in daily (Gao et al., 2022; Redzovic et al., 2023) .

Furthermore, the significant relationship between family support and independence highlights the important role of families in promoting healthy ageing (Haloho et al., 2024). Emotional encouragement, informational guidance, practical assistance, and positive reinforcement from family members may motivate older adults to remain active and maintain their functional abilities. These findings support the growing body of evidence emphasizing the role of family-centered care in preserving independence among community-dwelling older adults (Mayasari et al., 2022).

A notable contribution of this study is its focus on a community-based elderly population in a primary healthcare setting within Indonesia. While previous studies have predominantly focused on institutionalized older adults or urban populations, this study provides additional evidence regarding factors influencing independence among older adults participating in community health programs (Siti Rochmah et al., 2023).

The findings regarding health status are consistent with previous studies reporting that better physical health is associated with higher levels of independence among older adults. Research conducted in various countries has demonstrated that chronic diseases, physical disabilities, and declining functional status significantly increase the risk of dependency in activities of daily living (Li et al., 2025). Similar findings were reported by Andriyani et al., who found that health status was one of the strongest predictors of independence among elderly populations (M et al., 2025).

The present findings also align with previous research indicating that family support plays a critical role in maintaining functional independence. Studies conducted in Asian countries have shown that family involvement positively influences physical functioning, treatment adherence, psychological well-being, and quality of life among older adults. In collectivist cultures such as Indonesia, where family members often serve as primary caregivers, family support may be particularly influential in determining elderly independence (Mahmudi et al., 2025b; Surya & Alfita, 2025b).

However, some studies have reported weaker associations between family support and functional independence. Differences in cultural contexts, family structures, socioeconomic

conditions, healthcare accessibility, and measurement tools may explain these discrepancies. Additionally, variations in study populations and sampling methods may contribute to inconsistent findings across studies. These differences highlight the importance of conducting context-specific research to better understand factors influencing elderly independence in diverse settings.

The findings of this study have important implications for public health practice and policy. As populations continue to age globally, maintaining functional independence among older adults has become a major public health priority. The significant association between health status and independence suggests that preventive healthcare interventions aimed at controlling chronic diseases, promoting physical activity, and improving overall health status may contribute to preserving functional capacity among older adults.

The relationship between family support and independence underscores the need for family-centered approaches in geriatric care. Community health programs should actively involve family members in health education, caregiving training, and support initiatives designed to enhance the well-being of older adults. Strengthening family engagement may improve elderly independence and reduce the burden on healthcare systems.

These findings are also relevant to the implementation of the World Health Organization's Healthy Ageing Framework and Sustainable Development Goal 3, which seeks to ensure healthy lives and promote well-being for all ages. By identifying modifiable factors associated with elderly independence, this study contributes to ongoing efforts to support healthy ageing and improve quality of life among older populations.

Several limitations should be considered when interpreting the results of this study. First, the cross-sectional design limits the ability to establish causal relationships between health status, family support, and elderly independence. The observed associations indicate relationships but cannot determine temporal sequence or causality.

Second, the relatively small sample size and purposive sampling technique may limit the generalizability of the findings beyond the study population. Participants were recruited from a single community health post, which may not fully represent the broader elderly population in Indonesia.

Third, data collection relied on self-reported questionnaires, which may be subject to recall bias and social desirability bias. Respondents may have overestimated their level of family support or functional abilities. Additionally, other factors potentially influencing independence, such as cognitive function, socioeconomic status, depression, nutritional status, and physical activity levels, were not examined in this study.

Therefore, the findings should be interpreted cautiously and considered within the context of these methodological limitations.

Future studies should employ longitudinal or prospective cohort designs to better understand the causal pathways linking health status, family support, and functional independence among older adults. Larger and more diverse samples drawn from multiple regions would improve the external validity and generalizability of findings.

Further research should also investigate additional determinants of elderly independence, including cognitive function, mental health, social participation, economic conditions, nutritional status, and physical activity. Exploring the interactions among these factors may provide a more comprehensive understanding of healthy ageing.

Moreover, intervention studies evaluating family-centered health promotion programs, caregiver education, and community-based support strategies are needed to determine effective approaches for enhancing independence among older adults. Such evidence would be valuable for informing public health policies and strengthening healthy ageing initiatives in Indonesia and other low- and middle-income countries.

CONCLUSION

This study demonstrates that both health status and family support are significantly associated with independence in Activities of Daily Living (ADL) among adults aged 45 years and

older at Posbindu Tabeo, Central Sulawesi. Participants with better health status and stronger family support were more likely to maintain higher levels of functional independence.

These findings highlight that maintaining physical health and strengthening family involvement are important components in supporting functional ability in community-dwelling older adults. Therefore, community-based health programs should prioritize chronic disease management, health promotion, and family-centered interventions to help preserve independence in daily activities.

Although the study provides meaningful insights, its cross-sectional design limits causal inference, and the relatively small sample size restricts generalizability. Future research is recommended to use longitudinal or interventional designs with larger populations to better understand causal pathways influencing ADL independence.

Authors' Contribution Statement: Dwi Yulia Vasya contributed to the conceptualization of the study, development of the research proposal, data collection, data analysis, interpretation of findings, and manuscript preparation. Rina Tampake contributed to study supervision, methodological guidance, critical review of the manuscript, and interpretation of the results. Jurana contributed to data validation, manuscript revision, and scientific consultation throughout the research process. Rahmat Kurniawan contributed to study design development, data interpretation, manuscript review, and overall supervision of the research activities. All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work.

Conflicts of Interest: The authors declare that there are no conflicts of interest regarding the publication of this article. The authors have no financial, professional, or personal relationships with any organizations or individuals that could inappropriately influence the conduct, analysis, interpretation, or reporting of this study. This declaration ensures the integrity, objectivity, and credibility of the study.

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