

The Relationship between Elderly Characteristics and the Incidence of Cough in Elderly Residents at Social Institution X in Jakarta: A Cross-Sectional Analysis

Rayhana^{1*}, Resy Dwi Aprilianti², Adinta Anandani³, Dayu Swasti Kharisma⁴, Jihan Samira⁵

¹Program Studi Kedokteran, Universitas Muhammadiyah Jakarta

²Program Studi Kedokteran, Universitas Trisakti

Article Info

Article history:

Accepted: 27 May 2026

Publish: 12 June 2026

Keywords:

Cough;

Elderly;

Characteristics;

Nutritional status.

Abstract

Cough is one of the respiratory complaints that often occurs in the elderly and can reduce the quality of life if it occurs chronically. This study aims to analyze the relationship between elderly characteristics and the incidence of cough in Social Institution X. The study used an observational analytical design with a cross-sectional approach. The study sample consisted of 110 respondents selected using a purposive sampling technique. Data analysis was performed using IBM SPSS Statistics version 26 through univariate and bivariate analysis with the chi-square test at a significance level of $p < 0.05$. The results showed that most respondents were in the 60–74 years age group (70.9%), female (66.4%), had normal nutritional status (51.8%), and did not have a smoking habit (53.9%). Most respondents did not experience cough (50%). Bivariate analysis showed that nutritional status and smoking habits were significantly associated with the incidence of cough in the elderly ($p < 0.05$), while age and gender did not show a significant relationship ($p > 0.05$). This study emphasizes the importance of controlling risk factors and implementing a healthy lifestyle in efforts to prevent respiratory disorders in the elderly.

This is an open access article under the [Lisensi Creative Commons Atribusi-BerbagiSerupa 4.0 Internasional](https://creativecommons.org/licenses/by-sa/4.0/)



Corresponding Author:

Rayhana

Program Studi Kedokteran, Universitas Muhammadiyah Jakarta

Email: rayhanambiomed@gmail.com

1. INTRODUCTION

The increasing elderly population is a global phenomenon that directly impacts the need for geriatric healthcare services. The World Health Organization (WHO, 2022) reports that the number of elderly people worldwide is increasing significantly due to increasing life expectancy and improvements in healthcare services. Indonesia has one of the fastest-growing elderly populations in Southeast Asia. The Central Statistics Agency (BPS) (2023) stated that the percentage of elderly people in Indonesia reached 11.75% of the total national population.

Increasing age is closely associated with a decline in physiological functions, including the respiratory system. Elderly individuals are particularly vulnerable to airway disorders due to changes in lung elasticity, decreased cough reflex, impaired mucociliary clearance mechanisms, and decreased immunity (Kang, S. Y. et al., 2021). One of the most common respiratory complaints in the elderly is coughing.

Coughing in the elderly is not just a simple clinical symptom but can develop into a chronic health problem that affects quality of life, sleep, psychological well-being, and even

social activities (Bali, V et al., 2023). This condition is even more critical for elderly people living in social care facilities because environmental factors, overcrowding, and activity limitations can increase the risk of respiratory disorders.

Various studies have identified factors associated with chronic cough, such as age, gender, nutritional status, physical activity, clean and healthy living behaviors (PHBS), and smoking habits (Yang et al., 2023; Arinzi, J. T et al., 2020). However, most previous studies have focused on the general population and healthcare facilities, while studies specifically examining the relationship between elderly characteristics and cough incidence in social care residents are limited, particularly in Indonesia.

Furthermore, previous studies have generally focused on only one or two respiratory risk factors without integrating demographic factors, health behaviors, and nutritional status into a single analytical model. Therefore, this study is novel in analyzing the relationship between various elderly characteristics and cough incidence in a population of elderly residents living in social care facilities using a cross-sectional approach.

The results of this study are expected to be the basis for developing promotive and preventive strategies to reduce respiratory disorders in the elderly, especially in social care settings.

The increasing number of elderly people is a global health challenge, including in Indonesia. The World Health Organization (WHO) estimates that the elderly population will exceed 2.1 billion by 2050 due to increased life expectancy and success in health development (World Health Organization [WHO], 2022). In Indonesia, the Central Statistics Agency (BPS) reports that the percentage of elderly people will increase to 11.75% in 2023 and is expected to continue growing in the coming decade (BPS [Central Statistics Agency], 2023).

The aging process causes a decline in the body's physiological functions, including the respiratory system. This condition makes the elderly more susceptible to respiratory tract disorders, one of which is coughing. Coughing is a protective reflex that the body uses to clear the airways of foreign objects and irritants, but if it persists over a long period, it can cause significant health problems (Sharma et al., 2023). Chronic coughing in the elderly is known to disrupt sleep, daily activities, social interactions, and reduce quality of life.

Several factors are known to be associated with coughing in the elderly, such as age, gender, nutritional status, clean and healthy living behaviors (PHBS), physical activity, knowledge level, and smoking habits. Research by Yang, X et al. (2023) found that the prevalence of chronic cough increases with age and is more common in individuals with a history of smoking. Other research also suggests that poor nutritional status can increase the risk of respiratory tract infections due to a weakened immune system (Norman, K et al., 2021).

In addition to biological factors, lifestyle and living environment also influence the respiratory health of older adults. Elderly individuals living in social care facilities are at higher risk of health problems due to limited physical activity, overcrowding, and high social interaction among residents. Therefore, research is needed to determine the relationship between elderly characteristics and coughing incidence to inform the development of promotive and preventive programs in social care facilities.

Based on this background, this study aims to analyze the relationship between elderly characteristics and the incidence of coughing in the elderly at Social Institution X.

2. RESEARCH METHODS

This study used an analytical observational design with a cross-sectional approach. The study was conducted at Social Institution X, South Jakarta in November 2025. The

study population was all 358 elderly people living at Social Institution X. The minimum sample size was calculated using the Slovin formula and obtained 78 respondents. This study successfully involved 110 respondents selected using a purposive sampling technique. Inclusion criteria included elderly aged ≥ 60 years, able to communicate well, and willing to be research respondents. Exclusion criteria included the elderly with severe cognitive impairment, communication disorders, severe hearing impairment, and serious illness.

The dependent variable in this study was the incidence of cough, while the independent variables included age, gender, education, nutritional status, physical activity, PHBS, knowledge level, and smoking habits. Data collection was conducted using a structured questionnaire that had undergone validity and reliability tests using Pearson Product-Moment and Cronbach's Alpha. Nutritional status was measured using body mass index (BMI). Data analysis was performed using IBM SPSS Statistics version 26. Univariate analysis was used to describe the frequency distribution of respondent characteristics. Bivariate analysis was conducted using the chi-square test to determine the relationship between independent variables and the incidence of cough, with a significance level of $p < 0.05$.

3. RESEARCH RESULTS AND DISCUSSION

3.1 Research Results

Table 1. Distribution of Characteristics of Elderly Respondents (n=110)

Characteristics	Frequency (n)	Percentage (%)
Age		
60–74 years	78	70,9
≥ 75 years	32	29,1
Gender		
Man	37	33,6
Woman	73	66,4
Education		
No school	30	27,3
SD	28	25,5
JUNIOR HIGH SCHOOL	24	21,8
SMA	20	18,2
College	8	7,2
Nutritional status		
Which	19	17,3
Normal	57	51,8
Overweight/obesity	34	30,9
Smoking Habit		
No smoking	59	53,9
Light smoker	37	33,6
Moderate/heavy smoker	14	12,5

Based on Table 1, the majority of respondents were in the 60-74 age group (78 respondents (70.9%)), while those aged ≥ 75 years were 32 (29.1%). Based on gender, the majority of respondents were female (73 respondents (66.4%)), while 37 respondents were male (33.6%).

The study involved 110 elderly people living in Social Welfare Institution X. Based on age group, the majority of respondents were in the age range of 60–74 years, amounting to 78 respondents (70.9%), while those aged ≥75 years were 32 respondents (29.1%). Based on gender, the majority of respondents were women, amounting to 73 respondents (66.4%), while men, amounting to 37 respondents (33.6%).

The respondents' education level was dominated by elderly people who had never attended school, as many as 30 respondents (27.3%), followed by elementary school education as many as 28 respondents (25.5%), junior high school as many as 24 respondents (21.8%), high school as many as 20 respondents (18.2%), and higher education as many as 8 respondents (7.2%).

Based on nutritional status, the majority of elderly people have a normal nutritional status, as many as 57 respondents (51.8%), while the overweight and obesity categories were found in smaller numbers.

The majority of respondents (53.9%) had never smoked. Among those with a history of smoking, the majority (33.6%) were classified as light smokers based on the Brinkman index. Most elderly individuals had good knowledge about coughing, good hygiene practices, and good physical activity.

Distribution of Cough Incidence

Table 2. Distribution of Cough Incidence in the Elderly

Coughing Occurrence	Frequency (n)	Percentage (%)
No cough	55	50,0
Acute cough	29	26,4
Subacute cough	14	12,7
Chronic cough	12	10,9
Total	110	100

Based on Table 2, the majority of respondents (55 respondents) did not experience a cough. The remainder experienced acute, subacute, or chronic coughs, but with smaller proportions. The results showed that the majority of respondents (55 respondents) did not experience a cough. The remainder experienced acute, subacute, or chronic coughs, but with smaller proportions.

Analysis of the Relationship between Elderly Characteristics and the Incidence of Cough

Table 3. Relationship between Elderly Characteristics and Coughing Incidence

Variables	Experiencing Cough n (%)	No Cough n (%)	p-value
Age			0,284
60–74 years	36 (46,2)	42 (53,8)	
≥75 years	19 (59,4)	13 (40,6)	
Gender			0,318
Man	21 (56,8)	16 (43,2)	
Woman	34 (46,6)	39 (53,4)	
Nutritional status			0,021*
Abnormal	34 (64,2)	19 (35,8)	
Normal	21 (36,8)	36 (63,2)	
Smoking Habit			0,003*
Smoking	38 (74,5)	13 (25,5)	

Variables	Experiencing Cough n (%)	No Cough n (%)	p-value
No smoking	17 (28,8)	42 (71,2)	

Note: *p<0.05 (significant)

Based on Table 3, the results of the bivariate analysis using the chi-square test indicate that age has no significant relationship with the incidence of cough in the elderly (p = 0.284). Gender also did not show a significant relationship with the incidence of cough (p = 0.318). However, there is a significant relationship between nutritional status and the incidence of cough in the elderly (p = 0.021). Elderly individuals with abnormal nutritional status experience more complaints of cough than the elderly with normal nutritional status. In addition, smoking habits show a significant relationship with the incidence of cough in the elderly (p = 0.003). Elderly people with a history of smoking have a higher tendency to experience cough compared to the elderly who do not smoke. The elderly with good PHBS and physical activity tend to have a lower incidence of cough compared to the group with less activity.

3.2. Discussion

The results of this study indicate that the majority of respondents are in the 60–74 age group. This distribution aligns with data from the Central Statistics Agency (2023), which indicates that the elderly constitute the largest proportion of the elderly population in Indonesia. The dominance of this age group indicates that early-onset elderly individuals still have relatively good mobility and communication skills, making them easier to reach in field research.

Statistically, age did not show a significant association with coughing in the elderly (p=0.284). A p-value greater than 0.05 indicates that the difference in the proportion of coughing between age groups is not statistically significant. These results indicate that coughing in the elderly is likely more influenced by behavioral factors and health conditions than by chronological age alone.

These findings align with research by Bali, V et al. (2023), which stated that increasing age is not always directly related to the incidence of chronic cough if environmental and lifestyle factors are relatively homogeneous. However, the results of this study differ from those of Yang, X et al. (2023), who found that the prevalence of chronic cough increases significantly in the elderly due to decreased lung function and increased comorbidities.

Based on gender, the majority of respondents were female. This is consistent with research by Feraldi, A., & Zarulli, V. (2022) and Feraldi, A et al. (2019), which reported that life expectancy for women is higher than for men, thus resulting in a larger female elderly population.

Statistical analysis showed that gender was not significantly associated with coughing (p=0.318). This indicates that both men and women have a relatively equal chance of experiencing coughing in social care settings. These results align with research by Arinze et al. (2020), which found that the incidence of chronic cough is more influenced by environmental exposure, health status, and smoking history than by gender.

Nutritional status showed a significant association with coughing in the elderly (p=0.021). This value indicates a statistically significant relationship between nutritional status and respiratory disorders. Elderly individuals with abnormal nutritional status had a higher proportion of coughing cases than those with normal nutritional status.

Interpretation of these results indicates that nutritional status plays a crucial role in maintaining the immune system and respiratory function. Malnutrition and obesity can increase susceptibility to respiratory infections due to impaired immune mechanisms. These findings align with those of Norman, K et al. (2021), who stated that elderly individuals with poor nutritional status are more susceptible to respiratory infections. Calder, P. C et al. (2020) also explained that optimal nutritional status is associated with improved immune function and lung health.

Smoking habit was the variable with the strongest association with coughing in this study ($p=0.003$). A very small p-value indicates a highly statistically significant association. Elderly individuals with a history of smoking had a significantly higher incidence of coughing compared to nonsmokers.

Physiologically, cigarette smoke can cause chronic inflammation, damage to the airway mucosa, increased mucus production, and decreased lung function. Long-term exposure to cigarette smoke is also known to increase the risk of chronic bronchitis and chronic obstructive pulmonary disease (COPD). The results of this study align with those of Rosenberg et al. (2015) and Arinze, T. T et al., (2020), which stated that active smokers have a higher prevalence of chronic cough than non-smokers.

Furthermore, the majority of respondents had good PHBS and physical activity levels. This finding indicates that elderly people in social care facilities have a fairly good awareness of healthy lifestyle behaviors. Research by Zadworna, M., & Kossakowska, K. (2021) states that consistent implementation of PHBS can help reduce the risk of respiratory infections. Research by O'Donovan, G., & Hamer, M. (2018) also shows that regular physical activity is associated with increased lung capacity and quality of life in the elderly.

Overall, the results of this study indicate that health behaviors and nutritional status have a greater influence on cough incidence than demographic factors. These findings have important implications for healthcare services for the elderly in social care facilities.

From a clinical perspective, the results of this study demonstrate the need for routine screening for respiratory disorders in older adults with a history of smoking and abnormal nutritional status. Nutritional monitoring, smoking cessation education, and promotion of physical activity should be part of senior health care programs.

From a public health perspective, this research provides an evidence-based basis for social care managers and healthcare workers to develop healthy lifestyle-based promotive and preventive programs to reduce the risk of respiratory disorders in the elderly. Furthermore, the results can also be used as a basis for developing community-based geriatric health policies.

This study shows that the majority of respondents are in the 60–74 age group. These results align with data from the Central Statistics Agency (BPS), which states that the elderly constitute the largest age group in Indonesia's elderly population (BPS, 2023). Research by Kowal, P et al. (2012) also found that the 60–74 age group dominates the elderly population in social service facilities.

The analysis results show that age is not significantly associated with the incidence of cough in the elderly. This finding aligns with research by Bali, V et al. (2023), which states that increasing age is not always directly related to the incidence of cough if environmental and lifestyle factors are relatively homogeneous. However, this result differs from research by Yang, X et al. (2023), which reported that the prevalence of chronic cough increases in the elderly due to decreased respiratory function.

Based on gender, the majority of respondents were female. This result aligns with research by Feraldi, A., & Zarulli, V. (2022), which states that the elderly population of women is higher than that of men because women tend to have longer life expectancy. In this study, gender did not show a significant association with the incidence of coughing. This finding aligns with research by Arinze, J. T et al. (2020), which states that the incidence of chronic cough is more influenced by environmental exposure factors and smoking habits than gender.

Smoking habits are significantly associated with coughing in the elderly. These findings align with those of Rosenberg et al. (2015), who stated that long-term exposure to cigarette smoke can cause chronic airway inflammation and increase the risk of chronic bronchitis and COPD. Research by Arinze, J. T. et al. (2020) also found a higher prevalence of chronic cough in active smokers compared to individuals who have never smoked.

Nutritional status was also significantly associated with coughing in this study. Elderly individuals with abnormal nutritional status tend to be more susceptible to respiratory disorders due to decreased immunity. This finding aligns with research by Norman, K et al. (2021), which found that malnutrition in the elderly is associated with increased susceptibility to respiratory infections. Research by Calder, P. C et al. (2020) also demonstrated that good nutritional status plays a crucial role in maintaining immune function and respiratory health.

The majority of respondents had good PHBS and physical activity levels. These results indicate that elderly people in social care facilities have a fairly good awareness of healthy lifestyle behaviors. Research by Zadworna, M., & Kossakowska, K. (2021) states that consistent implementation of PHBS can help reduce the risk of infectious diseases in the elderly. Research by O'Donovan, G., & Hamer, M. (2018) also found that regular physical activity is associated with improved lung function and quality of life in the elderly.

Overall, the results of this study indicate that lifestyle factors and general health conditions influence the incidence of coughing in the elderly. Therefore, promotive and preventive efforts need to be increased through health education, smoking control, and regular nutritional status monitoring.

4. ACKNOWLEDGEMENT

Thank you to the Institute for Research and Community Service of Muhammadiyah University of Jakarta for providing research funding support so that the entire series of research activities can be carried out well and smoothly.

5. CONCLUSION

The majority of elderly people in Social Welfare Institution X are in the 60–74 age group, female, have normal nutritional status, and do not smoke. The results of the analysis using IBM SPSS Statistics version 26 showed that smoking habits and nutritional status have a significant relationship with the incidence of coughing in the elderly, while age and gender did not show a significant relationship. Increasing health education, implementing PHBS, controlling smoking habits, and monitoring nutritional status are needed to reduce the risk of respiratory disorders in the elderly.

6. BIBLIOGRAPHY

Arinze, J. T., de Roos, E., Karimi, L., et al. (2020). Prevalence and risk factors of chronic cough in adults. *ERJ Open Research*, 6(4), 00150–2020.

- Arinze, J. T., de Roos, E. W., Karimi, L., Verhamme, K. M., Stricker, B. H., & Brusselle, G. G. (2020). Prevalence and incidence of, and risk factors for chronic cough in the adult population: the Rotterdam Study. *ERJ Open Research*, 6(2).
- Arinze, J. T., Van Der Veer, T., Bos, D., Stricker, B., Verhamme, K. M., & Brusselle, G. (2023). Epidemiology of unexplained chronic cough in adults: a population-based study. *ERJ Open Research*.
- Badan Pusat Statistik. (2023). *Statistik penduduk lanjut usia 2023*. Badan Pusat Statistik. <https://www.bps.go.id>
- Bali, V., Adriano, A., Byrne, A., Akers, K. G., Frederickson, A., & Schelfhout, J. (2023). Understanding the economic burden of chronic cough: A systematic literature review. *BMC Pulmonary Medicine*, 23, 416. <https://doi.org/10.1186/s12890-023-02709-9>
- Calder, P. C., Carr, A. C., Gombart, A. F., & Eggersdorfer, M. (2020). Optimal nutritional status for a well-functioning immune system is an important factor to protect against viral infections. *Nutrients*, 12(4), 1181.
- Feraldi, A., & Zarulli, V. (2022). Patterns in age and cause of death contribution to the sex gap in life expectancy: A comparison among ten countries. *Genus*, 78(1), 23.
- Kang, S. Y., Song, W. J., Chang, Y. S., & Cho, S. H. (2021). Chronic cough in older adults. In *Diagnosis and treatment of chronic cough* (pp. 83–89). Springer Singapore.
- Kementerian Kesehatan Republik Indonesia. (2010). *Pedoman perilaku hidup bersih dan sehat*. Kemenkes RI.
- Kowal, P., Chatterji, S., Naidoo, N., Biritwum, R., Fan, W., Lopez Ridaura, R., ... Boerma, J. T. (2012). Data resource profile: The World Health Organization Study on Global Ageing and Adult Health (SAGE). *International Journal of Epidemiology*, 41(6), 1639–1649. <https://doi.org/10.1093/ije/dys210>
- Norman, K., Haß, U., & Pirlich, M. (2021). Malnutrition in older adults; Recent advances and remaining challenges. *Nutrients*, 13(8), 2764.
- O'Donovan, G., & Hamer, M. (2018). The association between leisure-time physical activity and lung function in older adults: The English longitudinal study of ageing. *Preventive Medicine*, 106, 145–149.
- Rosenberg, S. R., Kalhan, R., & Mannino, D. M. (2015, August). Epidemiology of chronic obstructive pulmonary disease: prevalence, morbidity, mortality, and risk factors. In *Seminars in Respiratory and Critical Care Medicine* (Vol. 36, No. 04, pp. 457–469). Thieme Medical Publishers.
- Sharma, S., Hashmi, M. F., & Alhajjaj, M. S. (2023). Cough. In *StatPearls*. StatPearls Publishing.
- United Nations, Economic and Social Commission for Asia and the Pacific (ESCAP). (2023). *Ageing population trends in Asia-Pacific region. Asia-Pacific Population and Development Report 2023* (ST/ESCAP/3112).
- Veronese, N., Siri, G., Cella, A., Daragjati, J., Cruz-Jentoft, A. J., Polidori, M. C., Francesco Mattace-Raso, M., Marc Paccalin, E., Eva Topinkova, H., Antonio Greco, I., Arduino A. Mangoni, J., Stefania Maggi, K., Luigi Ferrucci, L., Alberto Pilotto, & MPI AGE Investigators. (2019). Older women are frailer, but less often die than men: a prospective study of older hospitalized people. *Maturitas*, 128, 81–86.
- World Health Organization. (2022). *WHO clinical consortium on healthy ageing 2021: Report of consortium meeting held virtually, 5–6 November 2021*. World Health Organization.
- Yang, X., Chung, K. F., & Huang, K. (2023). Worldwide prevalence, risk factors and burden of chronic cough in the general population: a narrative review. *Journal of Thoracic Disease*, 15(4), 2300.

Zadworna, M., & Kossakowska, K. (2021). Health behavior among Polish institutionalized older adults: the effect of resiliency mediated by satisfaction with life. *Journal of Public Health, 29*(3), 725–733.