



Overview of Elderly Risk Factors on Symptoms and Severity of Community-Acquired Pneumonia Using the PSI Score

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Abstract

The hospital is one of the institutions engaged in health services. The main indicator of the standard of a health facility and is a measure of the quality of service, low customer satisfaction will have an impact on the number of visits that will affect the profitability of health facilities. This study aims to determine the effect of quality and the dominant variables that affect service on patient satisfaction at the Haji-Medan Hospital in 2020. The quantitative research was conducted through an analytical survey research approach with a cross sectional study approach. Testing through logistic regression on the independent variables, namely; Reliability, Responsiveness, Assurance, Empathy and Tangible from the respondents' questionnaire data as many as 80 samples. The results showed that service quality had a significant effect on patient satisfaction from four variables, namely; reliability p value 0.020 ($p < 0.05$), responsiveness p value 0.038 ($p < 0.05$), empathy p value 0.000 ($p < 0.05$), p value tangible 0.001 ($p < 0.05$). Assurance variable, the quality of health services has no effect on patient satisfaction with a p value of 0.332 ($p > 0.05$). The dominant variable affecting patient satisfaction is the empathy variable. It is recommended to improve services from the aspect of assurance in order to increase patient confidence in getting services so that patients can feel satisfied with the services provided.

Introduction

Community-acquired pneumonia (CAP) remains one of the most significant infectious diseases contributing to global morbidity and mortality, particularly among vulnerable populations such as older adults. Pneumonia is defined as an acute inflammatory condition of the pulmonary parenchyma caused by a variety of infectious agents, including bacteria, viruses, fungi, and parasites, which primarily affect the alveoli and distal airways (Annisa Sam et al., 2023; Natasya, 2022). Clinically, pneumonia presents with a spectrum of symptoms such as cough, fever, dyspnea, increased respiratory rate, and chest discomfort. However, these manifestations may vary considerably depending on host-related factors, including age, immune status, and underlying comorbidities (Farheen et al., 2021; Luján et al., 2013; Krukowski et al., 2023).

Among the different types of pneumonia, community-acquired pneumonia is of particular concern due to its high incidence and burden on healthcare systems worldwide. CAP is defined as an infection of the lung parenchyma acquired outside of hospital settings or within 48 hours of hospital admission, typically caused by pathogenic microorganisms, predominantly Gram-positive bacteria (Hidayat & Pratama, 2023; Ministry of Health of the Republic of Indonesia, 2023). Epidemiological evidence indicates that CAP is a leading cause of hospitalization and

death among infectious diseases, especially in elderly populations. According to global estimates, lower respiratory tract infections affected approximately 489 million individuals in 2019, and the World Health Organization reported that these infections accounted for approximately 2.5 million deaths worldwide in 2021, ranking among the top causes of mortality globally (World Health Organization, 2024).

The burden of CAP is particularly pronounced in older adults due to age-related physiological and immunological changes. Aging is associated with a progressive decline in immune function, a phenomenon known as immunosenescence, which reduces the body's ability to respond effectively to infectious agents (Kang et al., 2025; Wang et al., 2022; Xu et al., 2020; Quiros-Roldan et al., 2024). Additionally, structural and functional changes in the respiratory system, such as decreased mucociliary clearance, reduced lung elasticity, and impaired cough reflex, further increase susceptibility to respiratory infections (Yatera & Yamasaki, 2025). These changes are often compounded by the high prevalence of chronic comorbid conditions in elderly individuals, including cardiovascular disease, diabetes mellitus, chronic kidney disease, and cerebrovascular disorders, all of which may influence both the clinical presentation and progression of pneumonia (Zhao et al., 2023; Zhong et al., 2023; Di Yacovo et al., 2013; Corrales-Medina et al., 2015).

In the Indonesian context, the growing elderly population further amplifies the public health importance of CAP (Ekadinata et al., 2023; Oktaviani et al., 2022). Over the past decades, Indonesia has experienced a rapid demographic transition characterized by a significant increase in the proportion of older adults. It is projected that Indonesia will be among the countries with the fastest growth of the elderly population between 1990 and 2025 (Akbar et al., 2021; Wulandari et al., 2023). This demographic shift is accompanied by an increased burden of age-related diseases, including respiratory infections. National data indicate that the incidence of pneumonia increases with age, with higher prevalence rates observed in individuals aged 65 years and above (Widiastuti & Yurizali, 2023). Moreover, mortality rates associated with CAP in Indonesia are reported to range between 10% and 25% among older adults, highlighting the severity of this condition in the local setting (Hidayat & Pratama, 2023).

Given the high burden and clinical variability of CAP in elderly populations, accurate assessment of disease severity is essential for guiding appropriate clinical management and improving patient outcomes. One of the most widely used tools for assessing pneumonia severity is the Pneumonia Severity Index (PSI). The PSI is a validated clinical prediction model that estimates mortality risk and stratifies patients into different risk classes based on a combination of demographic characteristics, comorbid conditions, physical examination findings, and laboratory parameters (Suyastri et al., 2019; Katerina Spasovska et al., 2021). This scoring system incorporates 20 variables and provides a comprehensive framework for clinical decision-making, including determining the need for hospitalization and level of care.

Despite the widespread use of PSI in clinical practice, the relationship between elderly-specific risk factors, clinical symptom patterns, and severity classification remains complex and not fully understood. Elderly patients often present with atypical or less pronounced symptoms compared to younger individuals, which may complicate early diagnosis and delay appropriate treatment (Guo et al., 2023; Elias et al., 2024). For instance, classical symptoms such as fever and chest pain may be less prominent, while non-specific manifestations such as fatigue, confusion, or functional decline may be more common. This variability underscores the need for a more comprehensive understanding of how clinical symptoms manifest in elderly patients with CAP and how these manifestations relate to disease severity (Hou et al., 2025; Rosero et al., 2025; Joshi, 2024).

Previous studies have primarily focused on identifying risk factors associated with mortality or severe outcomes in CAP using analytical approaches. However, there remains a relative lack

of descriptive studies that systematically characterize the distribution of clinical symptoms and PSI-based severity among elderly patients in specific hospital settings, particularly in Indonesia. Understanding these patterns is important for providing baseline epidemiological data, improving clinical awareness, and supporting early recognition of CAP in elderly populations (Liu et al., 2023; Kang et al., 2026). Moreover, most existing studies emphasize statistical associations and predictive modeling, whereas fewer studies aim to provide a detailed descriptive overview of clinical presentations in real-world clinical settings.

In addition, local hospital-based data are crucial for capturing context-specific variations in patient characteristics, healthcare access, and disease patterns. Differences in demographic profiles, comorbidity prevalence, healthcare infrastructure, and clinical practices may influence both the presentation and severity of CAP. Therefore, studies conducted at the institutional level can provide valuable insights that complement broader epidemiological data and inform clinical practice at the local level.

Based on these considerations, this study aims to provide a comprehensive descriptive overview of elderly patients with community-acquired pneumonia treated at RSUD dr. Chasbullah Abdulmajid, Bekasi City, during the period May 2024 to April 2025. Specifically, the study seeks to describe the distribution of clinical symptoms, identify the profile of elderly-related risk factors based on variables included in the Pneumonia Severity Index, and classify disease severity according to PSI categories. By focusing on a descriptive analytical approach, this study does not attempt to establish causal or associative relationships but rather to present a detailed clinical profile of CAP in elderly patients within the study setting.

The novelty of this study lies in its integrated descriptive analysis of symptom patterns and PSI-based severity classification among elderly CAP patients in an Indonesian hospital context. By systematically presenting these data, the study contributes to the existing body of knowledge by providing a clearer understanding of how CAP manifests in elderly populations at the clinical level. The findings are expected to support clinicians in recognizing common and atypical presentations of CAP, facilitate more accurate severity assessment using PSI, and ultimately contribute to improved clinical management and patient outcomes.

Methods

Study Design and Setting

This study employed a quantitative observational design using a retrospective cross-sectional approach. This design was selected because it allows the researcher to examine existing clinical data at a single point in time without manipulating variables, making it appropriate for describing patterns of symptoms and disease severity among elderly patients with community-acquired pneumonia (CAP). The retrospective nature of the study enabled the utilization of previously recorded medical data, which is efficient in terms of time and resources while still providing valuable clinical insights.

The study was conducted at RSUD dr. Chasbullah Abdulmajid, Bekasi City, Indonesia, a secondary-level referral hospital that serves a diverse patient population. The selection of this setting was based on the availability of a sufficient number of CAP cases and the completeness of medical record documentation. Data were collected over a one-year period from May 2024 to April 2025 to ensure adequate representation of cases and to minimize potential seasonal variations in pneumonia incidence.

2.2 Study Population and Sampling

The target population of this study consisted of elderly patients diagnosed with community-acquired pneumonia. In this study, elderly individuals were defined as those aged 60 years and above, consistent with commonly accepted classifications in geriatric and public health research.

The inclusion criteria were carefully determined to ensure that only relevant and reliable data were included in the analysis. Patients were included if they had a confirmed diagnosis of CAP recorded in their medical records and if the data required for assessing clinical symptoms and calculating the Pneumonia Severity Index (PSI) were available. Patients with incomplete or missing key clinical data, unclear diagnoses, or inconsistencies in medical record documentation were excluded to maintain data quality and reduce potential bias.

A total of 73 patients were selected using a consecutive sampling technique. This method involves including all eligible patients who meet the inclusion criteria during the study period until the desired sample size is reached. Consecutive sampling was chosen because it is practical in retrospective studies and helps reduce selection bias compared to convenience sampling. By including all eligible cases, the sample is more likely to reflect the actual clinical population treated at the hospital, thereby improving the representativeness of the findings.

Variables and Data Collection

Data collection was conducted using a structured and standardized data extraction form developed by the researchers. This instrument was designed to ensure consistency and completeness in capturing all relevant variables from the medical records. The variables included in the study were selected based on clinical relevance and their alignment with the Pneumonia Severity Index (PSI) framework.

The collected data comprised demographic characteristics (particularly age), clinical symptoms (including cough, fever, shortness of breath, chest pain, and changes in sputum characteristics), comorbid conditions (such as cardiovascular disease, renal disease, and cerebrovascular disorders), physical examination findings, and laboratory parameters. These variables are essential for describing the clinical presentation of CAP and for assessing disease severity using standardized scoring systems.

The use of secondary data from medical records provides an objective source of clinical information; however, it also requires careful handling due to potential limitations such as incomplete documentation or variability in recording practices. To address this, the researchers applied a systematic approach to data extraction and ensured that only clearly documented and verifiable information was included in the dataset.

Pneumonia Severity Assessment (PSI Scoring)

The severity of pneumonia in this study was assessed using the Pneumonia Severity Index (PSI), a widely validated and internationally recognized clinical prediction tool. The PSI is designed to estimate the risk of mortality in patients with community-acquired pneumonia and to assist clinicians in making decisions regarding hospitalization and level of care.

The PSI scoring system incorporates 20 variables categorized into four main domains: demographic characteristics, comorbid conditions, physical examination findings, and laboratory results. Each variable contributes a specific number of points to the total score, which is then used to classify patients into different risk categories.

In this study, PSI scores were recalculated by the researchers for each patient based on the clinical information available in the medical records. This recalculation ensured consistency in scoring and minimized variability that might arise from differences in clinical documentation. After calculating the total score, patients were categorized into severity levels. For the purpose of analysis, these categories were grouped into three broader classifications: low severity, moderate severity, and high severity. This grouping was intended to simplify interpretation while maintaining the clinical significance of the PSI framework.

Data Management and Quality Control

To ensure the reliability and validity of the data, several quality control measures were implemented throughout the data collection and processing stages. All extracted data were cross-checked against the original medical records to verify accuracy and consistency. This step was crucial in minimizing data entry errors and ensuring that the dataset accurately reflected the recorded clinical information.

In cases where certain PSI variables were not explicitly documented, the researchers carefully reviewed the available information to determine whether the variable could be reasonably inferred. For example, if clinical notes clearly indicated normal findings, these were recorded accordingly. However, if the information was insufficient or ambiguous, the variable was treated as missing data and excluded from the PSI calculation. This conservative approach was adopted to avoid misclassification and maintain the integrity of the severity assessment.

Additionally, data cleaning procedures were performed prior to analysis to identify and address inconsistencies, duplicate entries, or outliers. These steps contributed to improving the overall quality of the dataset and ensuring that the results were based on accurate and reliable data.

Data Analysis

Data analysis was conducted using univariate descriptive statistical methods. This analytical approach was selected because the primary objective of the study was to provide a comprehensive overview of the clinical characteristics, symptom patterns, and severity distribution of CAP among elderly patients, rather than to examine causal relationships or test specific hypotheses.

Descriptive statistics were used to summarize the data in terms of frequencies and percentages. The results were presented in tables to facilitate clear and systematic interpretation. This method allows for an effective representation of the distribution of variables, including symptoms, comorbid conditions, and severity levels based on PSI classification.

It is important to note that no inferential statistical analysis (such as correlation or regression analysis) was performed in this study. Therefore, the findings are limited to descriptive interpretations and do not provide evidence of associations or causal relationships between variables. The results should be interpreted within this context.

Result and Discussion

Univariate Analysis

Univariate analysis is an analytical method used to summarize a dataset into useful information for a broad audience; an example of univariate analysis is descriptive statistics. Descriptive statistics constitute an essential component of research, employed to describe the fundamental characteristics of the data to be used. Data become meaningful when presented through a descriptive statistical summary of a dataset, with or without further analytical procedures, so that it can be easily understood. Descriptive statistics are used to communicate information in a simple manner. One common form of descriptive statistical presentation is the frequency distribution. The following tables present the frequency distribution results.

Table 1. Frequency Distribution of Symptoms

Symptom	True		False	
	n	%	n	%
Cough	69	94.5	4	5.5
Fever	41	56.2	32	43.8
Shortness of breath	67	91.8	6	8.2
Chest pain	12	16.4	61	83.6
Changes in sputum characteristics	1	1.4	72	98.6

As shown in Table 1, cough (94.5%) and shortness of breath (91.8%) were the most prevalent symptoms, while fever was present in only 56.2% of patients. Chest pain (16.4%) and sputum changes (1.4%) were less frequently reported. These findings indicate that respiratory symptoms dominate the clinical presentation of CAP in elderly patients.

The relatively lower prevalence of fever supports previous findings that elderly patients often present with atypical or less pronounced inflammatory responses due to immunosenescence (Kang et al., 2025). Similarly, studies by Guo et al. (2023) and Elias et al. (2024) reported that dyspnea and cough are more consistent indicators of CAP in older adults compared to classical symptoms such as fever and chest pain. These variations highlight the need for clinicians to rely on a broader clinical assessment rather than classical symptom criteria alone.

In addition, the number of symptoms experienced by patients is presented in Table 2.

Table 2. Distribution of Number of Symptoms

Number of Symptoms	Frequency (n)	Percentage (%)
2 symptoms	33	45.2
3 symptoms	36	49.3
4 symptoms	4	5.5
Total	73	100

Most patients presented with two to three symptoms, suggesting that community-acquired pneumonia (CAP) in elderly patients rarely manifests as a single, isolated clinical feature but rather as a constellation of interrelated symptoms. This pattern reflects the underlying complexity of disease expression in aging populations, where physiological decline, multimorbidity, and altered immune responses interact to shape clinical presentation. Unlike younger individuals, in whom infections often produce more distinct and localized symptoms, elderly patients tend to exhibit overlapping and less specific manifestations, making clinical recognition more challenging. The presence of multiple concurrent symptoms may also indicate a cumulative burden on various physiological systems, particularly the respiratory and cardiovascular systems, which are commonly compromised in this age group. Furthermore, symptom clustering may obscure the primary cause of illness, as similar symptom combinations can arise from other chronic conditions such as heart failure or chronic obstructive pulmonary disease. Therefore, this finding underscores the critical importance of comprehensive clinical evaluation that goes beyond symptom counting, incorporating detailed patient history, comorbidity assessment, and functional status evaluation. Such an approach is essential to avoid misdiagnosis or delayed treatment, both of which are associated with poorer outcomes in elderly patients with CAP.

PSI-Related Clinical Profile

The clinical and laboratory characteristics corresponding to variables included in the Pneumonia Severity Index (PSI) are summarized in Table 3

Table 3. Frequency Distribution of Severity According to PSI

Severity Level According to PSI	True		False	
	n	%	n	%
Nursing Home	0	0.0	73	100.0
Cancer	2	2.7	71	97.3
Liver	1	1.4	72	98.6
Cohesive Heart Failure	32	43.8	41	56.2
Cerebrovascular Disease (Stroke)	9	12.3	64	87.7
Kidney	4	5.5	69	94.5

Mental Status/Consciousness	5	6.8	68	93.2
Respiration	21	28.8	52	71.2
Systolic Blood Pressure	0	0.0	73	100.0
Body Temperature	0	0.0	73	100.0
Pulse	6	8.2	67	91.8
Ph	2	2.7	71	97.3
Bun	0	0.0	73	100.0
Natrium/sodium	32	43.8	41	56.2
Glucose	10	13.7	63	86.3
Hematocrit	0	0.0	73	100.0
PaO2/Arterial Blood Pressure	1	1.4	72	98.6
Pleural Effusion	3	4.1	70	95.9

The distribution of Pneumonia Severity Index (PSI) components observed in this study reflects a clinical profile characterized by a predominance of comorbidity-related and metabolic disturbances rather than acute physiological derangements. Notably, congestive heart failure and sodium abnormalities emerged as the most prevalent conditions, each affecting a substantial proportion of patients. This pattern suggests that, in elderly populations, the severity of community-acquired pneumonia (CAP) is strongly influenced by underlying chronic conditions and systemic imbalances rather than solely by the acute infectious process. From a pathophysiological perspective, cardiovascular dysfunction can exacerbate pulmonary congestion and impair gas exchange, thereby intensifying respiratory compromise even in the absence of severe infection. Similarly, sodium abnormalities commonly associated with inflammatory and neurohormonal dysregulation may indicate a broader systemic response to infection, as well as reduced physiological resilience (Zhao et al., 2023).

In contrast, several acute clinical parameters traditionally associated with severe pneumonia, such as systolic blood pressure abnormalities, body temperature changes, and elevated blood urea nitrogen (BUN), were not observed in this cohort. This absence may reflect a blunted physiological response among elderly patients, where homeostatic mechanisms fail to produce overt abnormalities despite the presence of significant illness. Such findings are consistent with the concept of atypical presentation in geriatric populations, where critical clinical changes may occur without corresponding deviations in standard vital signs or laboratory markers.

Furthermore, the relatively moderate prevalence of neurological impairment, respiratory rate abnormalities, and glucose disturbances highlights the heterogeneous nature of disease expression in this population. Rather than presenting with uniformly severe clinical deterioration, elderly CAP patients appear to exhibit selective vulnerabilities across different physiological systems. This reinforces the limitation of relying on single-parameter abnormalities in assessing disease severity.

Severity Distribution Based on PSI Classification

The severity classification of CAP based on the Pneumonia Severity Index (PSI) is presented in Table 4.

Table 4. Distribution of Pneumonia Severity Based on PSI

Severity Level	Frequency (n)	Percentage (%)
Low	38	52.1
Moderate	31	42.5
High	4	5.5
Total	73	100

Table 4 shows that the majority of patients were classified as having low severity (52.1%), followed by moderate severity (42.5%), and only a small proportion (5.5%) categorized as high severity. This distribution suggests that most elderly CAP patients in this study were admitted with relatively manageable disease severity.

This finding aligns with previous studies indicating that PSI is effective in stratifying patients based on mortality risk and guiding treatment decisions (Tuta-Quintero et al., 2024). However, the relatively low proportion of severe cases may reflect differences in healthcare access, early detection, or patient characteristics in the study setting.

Discussion

The results of the current study are to be viewed in the context of the whole field of geriatric medicine, in which the manifestation of the infectious diseases, such as community-acquired pneumonia (CAP) is inherently predetermined by the physiological changes associated with age. Instead of simply indicating variability, the pattern of symptom expression observed is an indication of structural change in host response. Reduced immune responsiveness, loss of cytokine production and thermoregulation, which is referred to as immunosenescence, is central to changing the clinical manifestation of infection in elderly populations (Kang et al., 2025). In turn, such classical indicators as fever are not reliable diagnostic markers anymore, and traditional diagnostic frameworks must be reinstated.

This has significant implications on clinical reasoning. The hitherto dependence on hallmark symptoms will lead to under-identification of CAP in older patients, especially when the clinical assessment is based on the paradigms that are found in younger populations. A more sensitive strategy is thus needed -one focusing on more functional and respiratory symptoms, e.g. dyspnea or minor alterations in physical functioning. This theoretical change is consistent with new concepts in geriatric care, which relate to the necessity to explain clinical manifestations in the framework of systemic vulnerability and not isolated pathological mechanisms.

In addition to the presentation of symptoms, the presence of several separate symptoms, as could be seen in the current research, should not be discussed as a mere additive process but instead as the manifestation of physiological intricacy. Acute infections in old age frequently co-exist with underlying chronic diseases, contributing to a complicated clinical expression. This is consistent with the idea of geriatric syndromes, where a combination of several factors come together to cause manifestations, which cannot be described by a specific disease. As noted by Tuta-Quintero et al. (2024), multimorbidity alters an acute illness into a multidimensional clinical event, which complicates its diagnosis and treatment.

In this view, the fact that several concurrent symptoms exist can indicate systemic decompensation and not necessarily disease severity. The limitation of this distinction is that symptom burden may be interpreted only separately. Symptom clustering must be interpreted to mean however, a warning of lower physiological reserve, as well as increased vulnerability, it may not necessarily be reflected in traditional severity scoring systems. This is a deeper interpretation of the clinical dynamics of CAP in older populations.

This complexity is further increased by the role of comorbidities. Such comorbidities as congestive heart failure and electrolyte imbalances are not only coinciding diagnoses but also active factors in the development of the disease and clinical outcomes. Heart dysfunction, e.g. can worsen congestion of the lungs and exchange of oxygen to worsen the respiratory impairment. Equally, electrolyte imbalances, especially hyponatremia, are indicators of systemic dysregulation in which inflammatory and neurohormonal processes are involved (Zhao et al., 2023). These communications describe how CAP in older patients should be viewed as a condition that exists in a complex of interconnected physiological disruptions.

Notably, comorbidities might not be explained by mechanisms in standardized tools of measuring pneumonia like the Pneumonia Severity Index (PSI). Although PSI offers a more systematic method of risk stratification, its main emphasis on acute physiological data does not allow the theory to reflect the wider picture of patient vulnerability. The researchers state that comorbidities tend to have synergy, meaning that their effects are greater than those of the additive scoring systems (Zhong et al., 2023). This brings up issues with the possible underestimation of risk in older patients with more or less stable vitals but with having substantial underlying health vulnerabilities.

The high proportion of low-to-moderate severity levels that were witnessed in the current study should thus be viewed with reservations. Instead of indicating a homogeneously benign disease picture, these results can indicate the intrinsic weaknesses of the Pneumonia Severity Index (PSI) usage in geriatric patients. According to Yatera and Yamasaki (2025), frailty, functional decline, and cognitive impairment are critical factors when it comes to determining outcomes but have not been included in traditional severity indices. In its turn, a more integrative assessment model, which involves the physiological scoring plus geriatric-specific indicators, is justified.

This would help have a more realistic depiction of patient risk, especially when clinical stability hides a patient vulnerability. It also shows the role of clinical judgment as an adjunctive tool to the standardized scoring systems. Practically, decisions ought not to be made on the basis of the numerical scores only but a comprehensive analysis of the general state of the patient should be taken. The data on the age distribution in the present study creates further perspectives regarding the nature of community-acquired pneumonia (CAP) in the elderly populations. The fact that the proportion of younger elderly patients is higher could be due to disparities in healthcare access, health-seeking behavior, and physiological resilience. Patients in this age bracket are also more likely to seek medical attention as soon as possible, and will be able to tolerate and accept hospitalization, but aged patients might be faced with barriers like lack of mobility or social dependency or cognitive impairment. These may slow down the presentation and make clinical management more complicated and may result in underrepresentation of hospital based data.

This trend has significant clinical and health care social ramifications. It indicates that the pressure of CAP amongst more developed aged populations might be under-appreciated, especially in environments where healthcare is inaccessible. To close this gap, the health accessibility needs enhancement, and the specific screening and early detection plans could be developed according to the groups of people at risk.

In a more general sense, the results of this paper highlight the necessity of the transition to more extensive and personalized care patterns. The treatment of CAP in geriatric patients cannot be distilled to the treatment of infection per se, but needs a comprehensive strategy that will incorporate comorbidity, functional status and physiological strength in general. This is in line with the increased focus on multidisciplinary care whereby healthcare professionals are required to collaborate in an attempt to support the multifaceted needs of geriatric patients.

Simultaneously, the research shows multiple limitations that can be taken into account when explaining the results. The retrospective design does not allow the determination of causal relationships, and depending on the medical record data creates the risk of information bias because of missing documentation. In addition, the applied descriptive analysis restricts the extent of deduction that can be made out of the data. Such limitations indicate the valuable directions of future research. It is evident that there are gaps that require research studies to use inferential statistics in order to establish the predictors of the disease severity and outcomes. The geriatric assessment tools (including frailty indices and functional measures) would also be useful to give a more detailed picture of CAP in older populations. Longitudinal designs can

also provide a very useful information about the disease progress and long term results, such as mortality, readmission, and quality of life.

Conclusion

Based on the results of the study examining the profile of elderly risk factors associated with symptoms and severity among community-acquired pneumonia patients using the Pneumonia Severity Index (PSI) score at RSUD dr. Chasbullah Abdulmadjid, Bekasi City, for the period May 2024–April 2025, the following conclusions can be drawn: 1) The most frequently observed clinical manifestations among patients were cough and dyspnea, with the majority of patients presenting a combination of two to three symptoms; 2) Severity assessment based on the PSI score indicated that most patients were categorized as having low to moderate severity, while only a small proportion fell into the high-severity category.

These findings indicate that elderly patients with community-acquired pneumonia exhibit variability in symptom presentation and disease severity; however, disease severity is also influenced by underlying clinical conditions and accompanying comorbidities. The use of the PSI score provides a systematic framework for severity assessment and supports clinical decision-making in the management of elderly patients with community-acquired pneumonia.

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