

Predictive Value of Geriatric Nutritional Risk Index for Readmission within 6-Months in Elderly Inpatients with Acute Exacerbation Chronic Obstructive Pulmonary Disease

Huan Liu^{1,*}, Jingsi Song^{2,*}, Zhiqiang Wang¹, Xingyu Xiong³, Zhi Li⁴, Xiaofan Jing¹

¹Department of Clinical Nutrition, West China Hospital, Sichuan University, Chengdu, People's Republic of China; ²Department of Clinical Nutrition, Shangjin Nanfu Hospital, West China Hospital, Chengdu, People's Republic of China; ³Department of Respiratory and Critical Care Medicine, Shangjin Nanfu Hospital, West China Hospital, Chengdu, People's Republic of China; ⁴Department of Intensive Care Unit, Shangjin Nanfu Hospital, West China Hospital, Chengdu, People's Republic of China

*These authors contributed equally to this work

Correspondence: Xiaofan Jing, Email stephy1024@163.com

Purpose: Elderly patients with acute exacerbation of chronic obstructive pulmonary disease (AECOPD) who are hospitalized have a higher incidence of nutritional risk. The geriatric nutritional risk index (GNRI) was applied to evaluate nutritional status in elderly AECOPD patients. Furthermore, its predictive value for 6-month readmission due to acute exacerbations was analyzed.

Patients and Methods: A total of 301 elderly AECOPD inpatients admitted to the Department of Respiratory and Critical Care Medicine from March 2023 to June 2024 were included. The demographic, clinical characteristics, smoking history, comorbidities, laboratory values, outcomes of all patients were collected. Evaluate the nutritional risk of patients using GNRI. Multivariate logistic regression model analysis was used to identify the influencing factors of readmission within 6-months.

Results: According to the GNRI, 180 subjects (59.80%) had nutritional risk (GNRI \leq 98). The readmission rate within 6-months was 32.56%. Single-factor logistic regression analysis showed that GNRI, Sex, BMI, length of hospital stay, heart failure, smoking and GOLD were significantly related to readmission within 6-months ($p < 0.05$). Multivariate logistic regression analysis showed that the risk factors for readmission within 6-months included GNRI (OR = 2.439, $p = 0.003$, 95% CI: 1.348–4.413), Current smoking (OR = 8.297, $p < 0.001$, 95% CI: 4.158–16.557), GOLD II (OR = 4.045, $p = 0.015$, 95% CI: 1.316–12.435), GOLD III (OR = 5.725, $p = 0.002$, 95% CI: 1.878–17.451), and GOLD IV (OR = 19.063, $p < 0.001$, 95% CI: 4.504–80.674).

Conclusion: The proportion of nutritional risk was higher in elderly AECOPD inpatients, and GNRI (GNRI \leq 98) is an independent risk factor for readmission due to acute exacerbations within 6-months.

Keywords: AECOPD, GNRI, nutritional risk, readmission within 6 months

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a common pulmonary disease, and its main characteristics are the presence of chronic respiratory symptoms: dyspnea, limited activity, coughing, with or without expectoration.¹ According to the report by the GBD 2019 Chronic Respiratory Diseases Collaborators: there are 212.3 million patients with COPD worldwide. Furthermore, the incidence rate gets higher with the increase of age.² The prevalence rate of COPD among people over 70 years old is as high as 24.03%.³ According to data from the WHO, COPD is the fourth leading cause of death worldwide. In 2021, patients who died from COPD accounted for 5% of the global total deaths.⁴ In addition, COPD also imposes a significant economic burden on the healthcare system.⁵

Due to various physiological and psychological reasons, the risk of malnutrition among the elderly increases.^{6,7} Factors such as inflammatory consumption, decreased food intake, and complications result in a relatively high incidence



of malnutrition in COPD patients.^{8,9} Owing to the varying nutritional assessment tools and the different severity, the incidence rate of malnutrition among COPD patients ranges approximately from 17% to 52% and is in direct proportion to the severity of the disease.^{10–13} Currently, it is commonly acknowledged that malnutrition can give rise to poor clinical prognosis. For patients with COPD, malnutrition can lead to numerous adverse clinical outcomes: acute exacerbation of the disease, increased medical costs and elevated risk of death.¹⁴ Therefore, it is particularly important to quickly identify elderly COPD patients with malnutrition and take intervention measures as early as possible.¹⁵

Tools commonly used for nutritional screening in the elderly include: The Malnutrition Universal Screening Tool (MUST),¹⁶ The Mini Nutritional Assessment (MNA),¹⁷ Nutritional risk screening 2002 (NRS2002).¹⁸ However, these tools are highly subjective or have a large number of items, which takes a long time and has certain limitations. The Geriatric Nutritional Risk Index (GNRI), proposed in 2005 by the Food and Nutrition Liaison Committee of Paris Descartes University, serves as a tool for assessing the nutritional status of elderly patients.¹⁹ Compared with traditional complex nutritional screening tools, it is simpler and more objective. It incorporates the albumin indicator and the patient's weight. For elderly inpatients, there is no need to answer excessive questions, and its clinical applicability is stronger. Multiple studies have demonstrated the prognostic value of the GNRI in elderly patients with various diseases.^{20–25} A lower GNRI has been associated with adverse clinical outcomes in patients with COPD: all-cause mortality, higher incidence of pressure injuries and longer ICU stays.^{26–28} Recent studies further validate its utility in predicting 90-day mortality among COPD patients admitted to the intensive care unit.²⁹ COPD is a globally acknowledged disease featuring a high readmission rate.³⁰ However, the predictive value of GNRI for 6-months due to acute exacerbations readmission of elderly inpatients with AECOPD remains unexplored and warrants further investigation.

Therefore, our study aims to gain insight into the current situation of nutritional risk by using GNRI and to assess the predicting value of GNRI for 6-months readmission due to acute exacerbations of elderly AECOPD patients.

Materials and Methods

Study Design and Study Population

This study was a retrospective study, including participants who were admitted to the Department of Respiratory and critical care medicine of a university affiliated hospital in Southwest China from March 2023 to June 2024. The inclusion criteria were as follows: (1) Aged 65 years or older; (2) Length of hospital stay ≥ 24 hours; (3) Principal diagnosis was AECOPD (International Classification of Diseases 10th Revision (ICD-10) codes J44.001 or J44.101), and admitted for the first time due to AECOPD.³¹ In addition, the exclusion criteria: (1) Incomplete information; (2) Combined with tumor diseases; (3) Combined with chronic kidney disease or chronic liver disease; (4) Death during hospitalization. The inclusion process is shown in [Figure 1](#).

This study was adhered to the ethical principles of the Declaration of Helsinki. The study protocol was approved by the Institutional Review Board of West China Hospital, Sichuan University (Approval No. 1178).

Study Variables

In this study, We retrieved the data of the study participants from the hospital information system (HIS). The primary outcome variable was the readmission rate due to acute exacerbation of COPD within 6-months.

The GNRI served as the exposure variable, which was calculated using the formula: $1.489 \times \text{Albumin}(\text{ALB g/l}) + 41.7 \times \left(\frac{\text{Weight}(\text{kg})}{\text{Ideal Weight}(\text{kg})} \right)$. A GNRI value below 98 indicates nutritional risk, warranting focused assessment of the likelihood of nutrition-related complications. And the ideal weight was determined by the Lorentz formula: $\text{Height}(\text{cm}) - 100 - [(\text{Height}(\text{cm}) - 150) \div 4]$ (Male), $\text{Height}(\text{cm}) - 100 - [(\text{Height}(\text{cm}) - 150) \div 2.5]$ (Female),¹⁹ The ALB[40.0–55.0g/L] was measured from the first post-admission blood sample using a Hitachi (NO:008AS) automated biochemical analyzer.

Additionally, the following variables were included as covariates: (1) demographic factors (sex, age); (2) body mass index ($BMI = \frac{\text{Weight}(\text{kg})}{\text{Height}(\text{m})^2}$); (3) functional independence status (Barthel Index);³² (4) COPD severity graded by GOLD 2023 criteria, based on the percentage of predicted forced expiratory volume in one second (FEV_1 % pred: I \geq 80%, II=50–79%, III=30–49%, IV<30%);³¹ (5) the common comorbidities (hypertension, diabetes mellitus, heart failure, coronary artery

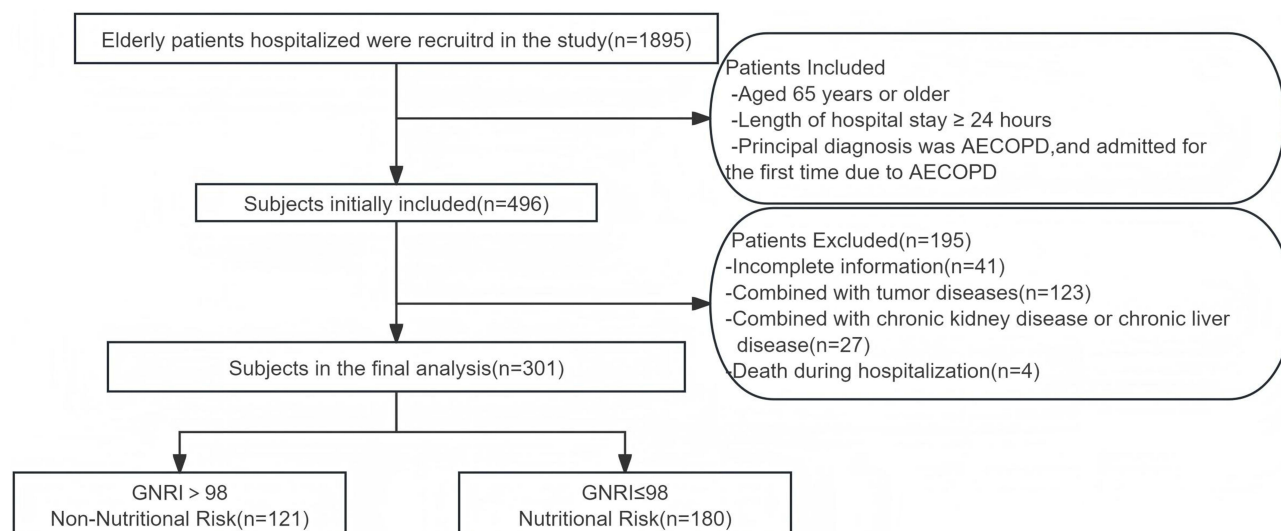


Figure 1 Inclusion and exclusion flowchart of the study.

disease,³³ and the number of comorbidities [≥ 3]); (6) smoking status (never [< 100 cigarettes in lifetime], former [> 100 cigarettes in lifetime but had quit smoking prior to hospital admission], current [> 100 cigarettes and continued smoking at the time of admission]);³⁴ (7) laboratory values (hemoglobin [$115\text{--}150$ g/L], lymphocytes [$1.1\text{--}3.2 \times 10^9/\text{L}$], total protein (TP) [$65\text{--}85$ g/L], albumin); and (8) healthcare utilization metrics (hospitalization costs, length of stay).

Statistical Analysis

SPSS 27.0 was used for statistical analysis. For the primary and secondary outcomes, descriptive statistics and distributions were used: measurement data of normal distribution were expressed as mean \pm standard deviation (SD), and comparison between groups was conducted by independent sample *t*-test; Metric data of skewed distribution were expressed by median (M), P25 and P75, non-parametric test Mann–Whitney *U*-test, frequency data or percentage (%), and chi-square test or Fisher’s exact probability method; Grade data were expressed as frequency or percentage (%), and non-parametric test Mann–Whitney *U*-test.

A univariate logistic regression analysis was performed to examine the potential factors influencing the readmission of elderly AECOPD inpatients within 6-months. The potential factors included are as follows: GNRI, age, sex, BMI, number of comorbidities, length of stay, total hospital cost, married, Barthel index score, diabetes mellitus, coronary heart disease, hypertension, heart failure, HB, Lymphocyte, TP, ALB, smoking and GOLD. Factors that demonstrated statistically significant differences were subsequently incorporated into Multiple logistic regression analysis. Stepwise regression was conducted using the forward likelihood ratio (LR) method. Variables that maintained statistical significance ($p < 0.05$) in the multivariate model were identified as independent risk factors for the readmission of elderly COPD inpatients within 6-months. Forest plots were generated using R version 4.3.3 software. The model fit was tested using the Hosmer–Lemeshow test, A receiver operating characteristic (ROC) curve was generated to analyze the predictive value of the predictive model for readmission within 6-months in elderly patients with COPD and indicators such as the area under the curve (AUC), sensitivity, and specificity were calculated. The threshold for statistical significance was $p < 0.05$.

Results

A total of 301 subjects were included. Table 1 shows the baseline patient characteristics, 59.80% of the patients had nutritional risk. The male-to-female ratio was 1.7:1 (191/110). The median age was 76 years old, with an interquartile range of 70–82. The median hospitalization cost was 12,828.30 yuan, and the median hospitalization duration was 12 days. The readmission rate within 6-months was 32.56%.

Table 1 Baseline Characteristics of Patients Admitted for the First Time Due to COPD

	Overall (n=301)	Nutrition Risk		p-value
		No (n=121)	Yes (n=180)	
Demographic				
Sex				0.098
Female, n (%)	110(36.54)	51(42.15)	59(32.78)	
Male, n (%)	191(63.46)	70(57.85)	121(67.22)	
Age, median [P ₂₅ ,P ₇₅] (years)	76[70,82]	76[70,82]	75.5[70,83]	0.619
Ethnicity				0.729
Han, n (%)	295(98.01)	119(98.35)	176(97.78)	
Zang, n (%)	6(1.99)	2(1.65)	4(2.22)	
Married				0.052
Yes, n (%)	229(76.08)	85(70.25)	144(80.00)	
No ^a , n (%)	72(23.92)	36(29.75)	36(20.00)	
Barthel Index (Self-care Ability, score)				0.421
Worse, ≤20, n (%)	38(12.62)	20(16.53)	18(10.00)	
Poor, 21–40, n (%)	40(13.29)	15(12.40)	25(13.89)	
Acceptable, 41–60, n (%)	153(50.83)	59(48.76)	94(52.22)	
Good, ≥60, n (%)	70(23.26)	27(22.31)	43(23.89)	
BMI, median [P ₂₅ , P ₇₅] (kg/m ²)	21.55 [18.77,24.65]	24.84[22.66,26.78]	19.53[17.90,21.61]	<0.001
Clinical characteristics				
GOLD				0.212
I, n (%)	42(13.95)	23(19.01)	19(10.56)	
II, n (%)	118(39.20)	45(37.19)	73(40.56)	
III, n (%)	120(39.87)	46(38.02)	74(41.11)	
IV, n (%)	21(6.98)	7(5.79)	14(7.78)	
GNRI	96.22(SD 10.67)	106.28(SD 7.01)	89.46 (SD 6.59)	<0.001
Comorbidities				
Number Of Comorbidities, median [P ₂₅ , P ₇₅]	7[5,9]	7[5,9]	7[5,9]	0.949
Hypertension, n (%)				<0.001
Yes	104(34.55)	61(50.41)	43(23.89)	
No	197(65.45)	60(49.59)	137(76.11)	
Diabetes Mellitus, n (%)				0.648
Yes	55(18.27)	24(19.83)	31(17.22)	
No	246(81.73)	97(80.17)	149(82.78)	
Coronary Heart disease, n (%)				0.542
Yes	38(12.62)	17(14.05)	21(11.67)	
No	263(87.38)	104(85.95)	159(88.33)	
Heart Failure, n (%)				0.523
Yes	24(7.97)	8(6.61)	16(8.89)	
No	277(92.03)	113(93.39)	164(91.11)	
Smoking ^b				0.264
Never, n (%)	130(43.19)	51(42.15)	79(43.89)	
Previous, n (%)	95(31.56)	44(36.36)	51(28.33)	
Current, n (%)	76(25.25)	26(21.49)	50(27.78)	
Laboratory Values				
HB (g/L)	127.9(SD 22.59)	132.93(SD 22.38)	124.52(SD 22.15)	0.001
Lymphocyte (10 ⁹ /L)	1.23(SD 0.69)	1.32(SD 0.72)	1.17(SD 0.66)	0.077
TP (g/L)	62.63(SD 6.86)	65.19(SD 5.58)	60.92(SD 7.12)	<0.001
ALB (g/L)	37.08(SD 4.40)	39.93(SD 3.61)	35.17(SD 3.81)	<0.001
Healthcare Utilization Metrics				
Total Hospital Cost, median [P ₂₅ , P ₇₅] (yuan)	12828.30[9475.05,17353.29]	11434.02[8303.11,15764.37]	14076.01[9911.03,18474.00]	0.015
Length Of Stay, median [P ₂₅ ,P ₇₅] (days)	12[9,15]	11[8,14]	12.5[9,15]	0.057

(Continued)

Table 1 (Continued).

	Overall (n=301)	Nutrition Risk		p-value
		No (n=121)	Yes (n=180)	
Outcomes				
Readmission within 6-months, n (%)				0.001
Yes	98(32.56)	26(21.49)	72(40.00)	
No	203(67.44)	95(78.51)	108(60.00)	

Notes: ^aspouse died or divorced; ^bTobacco smoking.

Abbreviations: BMI, body mass index; HB, hemoglobin; TP, total protein; ALB, albumin; SD, standard deviation.

The patients were divided into two groups based on the GNRI with a threshold of 98. There were no statistically significant differences between the two groups in terms of gender, age, ethnicity, married, self-care ability, GOLD classification, the number of comorbidities, diabetes, coronary heart disease, heart failure, smoking history, lymphocyte and the length of hospital stay. The hospitalization costs and the 6-month readmission rate of the nutritional risk group were both higher than those of the non-risk group ($p < 0.05$), while the levels of HB, ALB, TP, BMI and GNRI were lower than those of the non-nutritional risk group ($p < 0.05$). It is notable that, the average level of albumin for all patients was 37.08 g/L, which was below the normal range. The baseline characteristics are shown in [Table 1](#).

A single-factor logistic regression analysis was conducted using the readmission within 6 months as the dependent variable. [Table 2](#) showed that age, the number of comorbidities (≥ 3), total hospitalization cost, marital status, self-care ability, diabetes mellitus, coronary heart disease, hypertension, albumin, HB, lymphocyte count, and total protein were not significantly correlated with readmission within 6 months ($p > 0.05$); while GNRI, Sex, BMI, length of hospital stay, heart failure, smoking and GOLD were significantly related to readmission within 6-months ($p < 0.05$). The variables with

Table 2 Results of the Multivariate Logistic Regression Analysis

Factor	β	SE	Wald χ^2	p-value	OR (95% CI)
GNRI	0.890	0.269	10.988	0.001	2.436(1.439,4.124)
Age(years)	-0.016	0.017	0.855	0.355	0.984(0.952,1.018)
Sex	-0.527	0.265	3.945	0.047	0.590(0.351,0.993)
BMI					
<20 kg/m ²			5.004	0.082	
20 kg/m ² ≤~27 kg/m ²	-0.591	0.264	4.999	0.025	0.554(0.330,0.930)
≥27 kg/m ²	-0.360	0.432	0.694	0.405	0.698(0.299,1.627)
Number Of Comorbidities ^a	0.801	0.792	1.023	0.312	2.227(0.472,10.508)
Length Of Stay(days)	0.046	0.021	5.079	0.024	1.047(1.006,1.090)
Total Hospital Cost (yuan)	0.000	0.000	3.314	0.069	1.000(1.000,1.000)
Married	0.046	0.287	0.026	0.872	1.047(0.597,1.839)
Barthel Index Score					
≥60			7.154	0.067	
41–60	-0.257	0.312	0.678	0.410	0.773(0.419,1.426)
21–40	0.715	0.406	3.100	0.078	2.043(0.922,4.528)
≤20	0.061	0.426	0.020	0.887	1.063(0.461,2.450)
Diabetes Mellitus	-0.534	0.345	2.402	0.121	0.586(0.298,1.152)
Coronary heart disease	-0.193	0.381	0.258	0.612	0.824(0.391,1.739)
Hypertension	0.339	0.255	1.761	0.185	1.403(0.851,2.315)
Heart Failure	0.982	0.430	5.217	0.022	2.670(1.150,6.199)
HB value(g/L)	0.121	0.264	0.210	0.647	1.129(0.672,1.895)
Lymphocyte value(10 ⁹ /L)	0.438	0.248	3.109	0.078	1.550(0.952,2.521)
TP value(g/L)	0.353	0.265	1.784	0.182	1.424(0.848,2.392)
ALB value(g/L)	0.575	0.304	3.591	0.058	1.778(0.980,3.224)

(Continued)

Table 2 (Continued).

Factor	β	SE	Wald χ^2	p-value	OR (95% CI)
Smoking					
Never			39.267	<0.001	
Previous	0.198	0.323	0.375	0.540	1.219(0.647,2.294)
Current	1.878	0.321	34.140	<0.001	6.540(3.483,12.278)
Gold					
I			16.053	0.001	
II	1.138	0.517	4.839	0.028	3.120(1.132,8.602)
III	1.491	0.512	8.462	0.004	4.440(1.626,12.122)
IV	2.487	0.655	14.419	<0.001	12.025(3.331,43.408)

Notes: a.Number of comorbidities ≥ 3 .

Abbreviations: OR, odds ratio; CI, confidence interval.

Table 3 Results of Multivariate Logistic Regression Analysis

Factor	β	SE	Wald χ^2	p-value	OR (95% CI)
GNRI	0.892	0.303	8.688	0.003	2.439(1.348,4.413)
Smoking					
Never			39.433	<0.001	
Previous	0.365	0.341	1.146	0.284	1.441(0.738,2.812)
Current	2.116	0.353	36.026	<0.001	8.297(4.158,16.557)
Gold					
I			17.296	0.001	
II	1.397	0.573	5.948	0.015	4.045(1.316,12.435)
III	1.745	0.569	9.417	0.002	5.725(1.878,17.451)
IV	2.948	0.736	16.037	<0.001	19.063(4.504,80.674)

statistically significant differences in the above univariate analysis were included in the multivariate logistic regression analysis. The results showed that GNRI (OR = 2.439, p = 0.003, 95% CI: 1.348–4.413), Current smoking (OR = 8.297, p < 0.001, 95% CI: 4.158–16.557), GOLD II (OR = 4.045, p = 0.015, 95% CI: 1.316–12.435), GOLD III (OR = 5.725, p = 0.002, 95% CI: 1.878–17.451), and GOLD IV (OR = 19.063, p < 0.001, 95% CI: 4.504–80.674) were independent risk factors for readmission within 6-months of elderly AECOPD inpatients (Table 3, Figure 2). The Hosmer-Lemeshow test showed that the model fitting effect was good ($\chi^2 = 7.288$, p = 0.399).

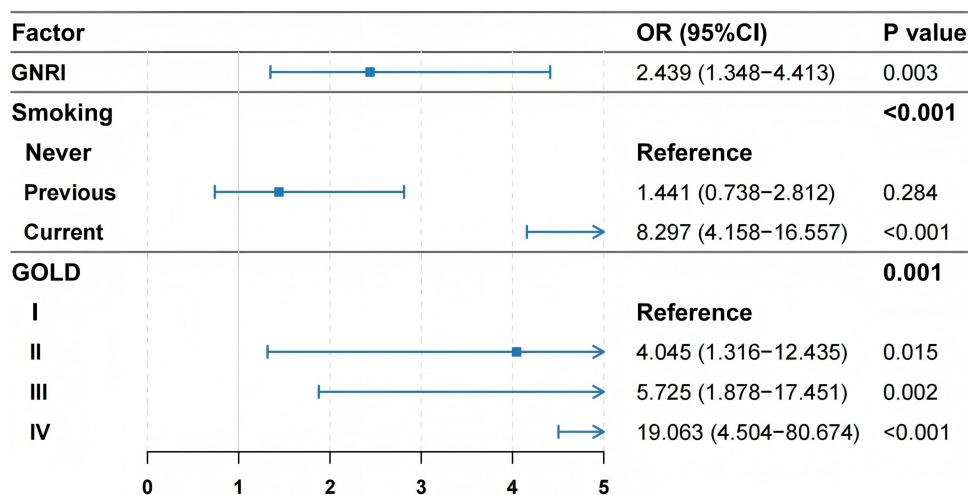


Figure 2 Forest plot. The correlation between GNRI and readmission within 6-months.

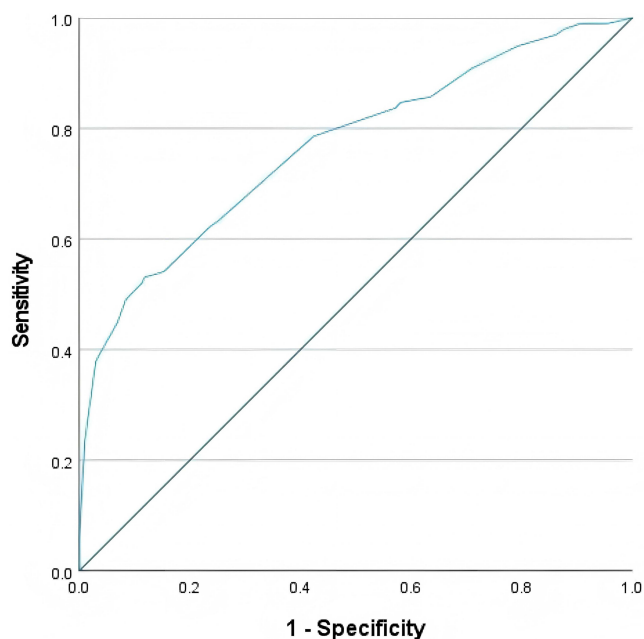


Figure 3 ROC curve prediction for 6 months readmission rate.

The ROC AUC was 0.767 (95% CI:0.707–0.827, sensitivity:53.1%, specificity: 88.2%), indicating that the model had good overall discrimination and could be used to predict the risk of readmission within 6 months in elderly AECOPD patients (Figure 3).

Discussion

This study conducted a retrospective analysis of the data of 301 elderly patients with AECOPD who were hospitalized. Nutritional status was assessed using the GNRI, revealing that 59.8% of patients were at nutritional risk (GNRI \leq 98). The 6-months readmission rate was 32.56%, with a significant difference observed between the non-nutritional risk group (21.49%) and the nutritional risk group (40.00%). Furthermore, multivariable logistic regression analysis demonstrated that a lower GNRI value was an independent risk factor for readmission within 6 months.

Since its introduction, the GNRI has demonstrated greater objectivity than questionnaire-based tools, making it more suitable for assessing nutritional risk in elderly hospitalized patients. GNRI is calculated using albumin levels and the ratio of actual to ideal body weight, providing a clinically valuable tool for nutritional risk assessment.³⁰ Moreover, as an auxiliary diagnostic indicator, GNRI enhances diagnostic accuracy while reducing limitations.³⁵ GNRI is a reliable predictor of sarcopenia in adults aged 45 and older.³⁶ Additionally, GNRI had higher sensitivity compared to Nutric score and onodera prognostic nutritional index(OPNI) for the prediction of 30-day hospital mortality.^{35,37} Albumin, a well-established biomarker of malnutrition,³⁸ often decreases under inflammatory conditions.³⁹ Hypoalbuminemia may result from multiple factors, including inadequate dietary intake/absorption, advanced age, comorbidities, and pro-inflammatory cytokines that suppress albumin synthesis, with cumulative effects exacerbating the risk.⁴⁰ In this study, the mean albumin level in hospitalized COPD patients was below the normal range, consistent with findings by Zinellu et al, who reported significantly lower serum albumin concentrations in COPD patients compared to non-COPD individuals.³⁹

COPD is a chronic wasting disease. Due to increased energy consumption, electrolyte imbalance, poor digestion and the influence of medication, it can lead to poor nutritional status.^{41,42} At the same time, as age increases, the functions of various organs decline and metabolic capacity decreases, elderly people often have problems such as insufficient nutrient intake and absorption disorders.⁴³ The risk rate of malnutrition in this study (59.8%) was relatively high, which was similar to the results obtained using other assessment tools.^{44–47} Some studies report that the incidence of readmission within 6-months for patients with acute COPD ranges from 17.9% to 63.0%.^{48–53} In our study, the readmission rate of elderly COPD inpatients within 6-months was 32.56%, and the readmission rate of the nutritional risk group was higher

than that of the non-risk group. The results of multivariate analysis showed that patients with nutritional risk (GNRI \leq 98) were associated with an increased readmission rate within 6-months and were an independent risk factor. Consistent with the findings of Zhang et al, patients with nutritional risk have a higher risk of readmission, which may be related to the poor nutritional status leading to reduced muscle mass and functional impairment, weakening the strength of respiratory muscles, further affecting respiratory function, and promoting acute exacerbation of COPD.⁴² Poor nutritional status is a risk factor for prolonged hospital stay, increased hospitalization costs, more readmissions, and higher mortality rates in COPD patients.^{14,26,54,55} Furthermore, poor nutritional status may weaken the body's immune function, cause infections and deterioration of the condition, and increase the risk of acute exacerbation and readmission.⁵⁶ Therefore, early identification of the nutritional status of elderly COPD inpatients and timely nutritional intervention are effective means to improve the prognosis of patients and reduce medical costs.^{54,57}

Analysis of factors associated with 6-month readmission in elderly hospitalized patients with AECOPD, we also found that current smoking status and the GOLD classification criteria also have a significant impact on the readmission of patients. GOLD has proposed that smoking is one of the significant risk factors for COPD.³¹ Compared with non-smokers, smokers experience a more rapid decline in lung function and have a higher mortality rate.¹ The results of a 5-year follow-up cohort study involving 2,000 COPD patients showed that the decline in FEV1 among current smokers was significantly greater than that among previous smokers.⁵⁸ In this study, it was found that current smoking is an independent risk factor for readmission within 6-months for patients. Therefore, we advocate for elderly AECOPD patients to quit smoking as much as possible to reduce the risk of readmission. Research demonstrated that the GOLD classification was significantly associated with the risk of readmission for COPD patients by Wong et al.⁵² In our study, the logistic regression analysis showed that the higher the GOLD classification, the greater the impact on the 6-months readmission rate of elderly AECOPD patients. Pulmonary rehabilitation after acute exacerbation has been proven to reduce the readmission rate.⁵⁹ It is recommended that COPD patients should actively engage in pulmonary rehabilitation after discharge, in order to slow down the deterioration of their lung function.

Our study has limitations. First, although the study has revealed the predictive value of GNRI for the readmission rate of elderly COPD patients within 6-months of hospitalization, the long-term prognostic value still requires further research. Second, this study is a retrospective study and thus cannot explain the causal relationships among these factors. Third, the study population was recruited from a university hospital and a methodological limitation involves the potential under-ascertainment of readmissions at non-study hospitals; Finally, the subjects included in this study are hospitalized patients, and ALB is relatively easy to obtain. However, its application to elderly people in the community still has certain limitations, as ALB requires blood testing in medical institutions.

Conclusion

This study demonstrates the proportion of elderly AECOPD inpatients with nutritional risk was relatively high. GNRI was an independent risk factor for readmission within 6-months for patients. In elderly patients with AECOPD, regular monitoring of body weight and albumin levels is recommended. For those exhibiting albumin levels below the normal range, calculation of the GNRI should be considered to assess clinical outcomes. A GNRI value below 98 warrants analysis of the underlying causes of hypoalbuminemia and implementation of targeted interventions. If possible, we recommend GNRI as a nutritional risk screening tool for elderly AECOPD inpatients, to identify patients with nutritional risk early.

Data Sharing Statement

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Institutional Review Board Statement

This study has been approved by the Biomedical Ethics Review Committee of West China Hospital, Sichuan University (approval No. 1178).

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no competing interests.

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