International Journal of Chronic Obstructive Pulmonary Disease

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RAPID COMMUNICATION

Prevalence and Associated Factors of COPD Awareness and Screening Intention among Community-Dwelling Older Adults in China

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International Journal of Chronic Obstructive Pulmonary Disease downloaded from https://www.dovepress.com/
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Background: Chronic obstructive pulmonary disease (COPD) has recently been incorporated into the National Basic Public Health Service Program because of its high prevalence and substantial mortality burden among elderly Chinese individuals. However, little is known about COPD awareness, screening intention, and their associated factors.

Methods: Between September 2024 and February 2025, a structured questionnaire survey was conducted among community-dwelling older adults in Jiangsu and Shandong provinces, China, to collect data on potential influencing factors, COPD awareness, and screening intention. We identified factors associated with COPD awareness and screening intention using univariable binary logistic regression analyses.

Results: Among the 574 participants, 116 (20.21%) had heard of COPD and 412 (71.78%) expressed willingness to undergo screening. Higher education (*OR* = 4.522, 95% *CI*: 2.198–9.947), rural residence (*OR* = 0.428, 95% *CI*: 0.274–0.658), being employed (*OR* = 0.246, 95% *CI*: 0.094–0.535), higher income (*OR* = 2.941, 95% *CI*: 1.727–4.966), and vaccination history (*OR* = 2.221, 95% *CI*: 1.426–3.437) were associated with COPD awareness. Older age (*OR* = 1.498, 95% *CI*: 1.025–2.201), rural residence (*OR* = 1.512, 95% *CI*: 1.046–2.196), higher income (*OR* = 0.586, 95% *CI*: 0.355–0.980), having a chronic condition (*OR* = 1.467, 95% *CI*: 1.019–2.117), participation in community-based chronic disease management (*OR* = 1.547, 95% *CI*: 1.073–2.241), and vaccination history (*OR* = 1.583, 95% *CI*: 1.017–2.523) were associated with screening intention.

Conclusion: This study provides up-to-date evidence that Chinese elderly have low COPD awareness but a relatively high screening intention, and identifies socio-demographic characteristics, physical health, and healthcare utilization as important associated factors, with public health implications for guiding community-based health education and improving early detection strategies.

Keywords: chronic obstructive pulmonary disease, COPD, awareness, screening intention, older adults, China

Introduction

Chronic obstructive pulmonary disease (COPD) is a major global public health challenge because of its high prevalence and substantial disability and mortality burden.[1] In China, it is estimated that approximately 100 million individuals are affected by COPD, with a prevalence exceeding 27% among adults aged ≥60 years.[1] Apart from respiratory impairment, COPD frequently coexists with cardiovascular conditions, highlighting its broader impact on cardiopulmonary health among older adults.[2,3] In response, COPD was incorporated into the National Basic Public Health Service Program in 2024, becoming the third key chronic disease targeted for prevention and control, following hypertension and type 2 diabetes.[4]

Beyond government policy initiatives, system-level factors such as physician awareness, accessibility of healthcare services, and availability of diagnostic resources could also influence COPD detection, particularly among older adults.[5] However, these factors operate within a healthcare pathway that is ultimately initiated by individuals' symptom

https://doi.org/10.2147/COPD.S601417
Received: 5 February 2026
Accepted: 20 August 2026
Published: 16 October 2026

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recognition and subsequent healthcare-seeking behavior. From this analytical perspective, population-level COPD awareness and screening intention may play important roles in facilitating early diagnosis and timely intervention.[6]

Existing studies consistently indicate low COPD awareness among Chinese community residents,[7–9] with only 1.87% of older adults, a population at particularly high risk of COPD, recognizing the disease by name.[7] In contrast, epidemiological evidence on COPD screening intention remains scarce, with only one study reporting that 79.69% of older adults were willing to undergo screening.[8] Additionally, limited literature has examined factors associated with COPD awareness and screening intention, including socioeconomic status, clinical characteristics, and health-related behaviors.[8,9]

In the present study, we assessed the prevalence of COPD awareness and screening intention and identified their associated factors among older Chinese adults.

Methods

Study Design and Participants

This population-based cross-sectional study was conducted among community-dwelling adults aged ≥60 years from eight urban and rural communities in Jiangsu and Shandong provinces, China, between September 2024 and February 2025, as described in a previous publication.[10] A structured questionnaire was used to collect information on potential factors associated with COPD awareness and screening intention (Table S1). The study protocol was approved by the Ethics Commission of Peking University Health Science Centre (IRB00001052-24090), written informed consent was obtained from all participants, and each procedure was performed in accordance with the Declaration of Helsinki.

The required sample size was determined based on previously reported prevalence estimates of 1.87% for COPD awareness and 79.69% for screening intention among older Chinese adults.[7,8] Assuming a two-sided significance level of 0.05 and a margin of error of 5%, the minimum sample sizes for the two outcomes were calculated as 28 and 249 participants, respectively. The larger value was selected as the minimum required sample size. Considering community-based sampling design, potential clustering effects, and possible exclusions, 500 participants were needed.

Participants were recruited from eligible households in the designated communities, with one adult aged ≥60 years selected from each household. Individuals with cognitive impairment or other severe illnesses that could affect the informed consent process were excluded. Of the 640 participants recruited during the study period, 14 were excluded because they were unable to complete the questionnaire survey. The remaining 626 participants completed the questionnaire survey, of whom 52 were further excluded due to missing data on COPD awareness, screening intention, or variables of interest, resulting in a final analytical sample of 574 participants.

Data Collection and Measures

The questionnaire was developed by our research team based on validated instruments and relevant literature. Expert panels in epidemiology, psychology, and behavioral science assessed its face validity and provided suggestions for revision. A pilot test was conducted prior to formal implementation. All data were collected by trained investigators through face-to-face interviews.

Based on existing literature[8,9] and theoretical considerations,[11] variables of interest were categorized into five groups: socio-demographic characteristics, physical health, healthcare utilization, mental health, and social support.

Outcome Variables

The outcome variables for this study were COPD awareness and screening intention, ascertained from the following questions:

> Have you ever heard of chronic obstructive pulmonary disease (COPD)?
>
> and
>
> If you experience respiratory symptoms such as dyspnea, chronic cough, or sputum production, would you be willing to undergo screening for chronic obstructive pulmonary disease (COPD)?

COPD awareness was coded as a binary variable (Yes/No), and screening intention was measured using a 5-point Likert scale, with "Strongly agree" and "Agree" classified as "Yes" and all other responses as "No".

Statistical Analysis

Participants' characteristics were summarized using descriptive statistics, with continuous variables presented as means ± standard deviations (SDs) and categorical variables as frequencies and percentages. Univariable binary logistic regression was conducted to identify factors associated with COPD awareness and screening intention. All results were reported as unadjusted odds ratios (OR_us) and corresponding 95% confidence intervals (*CI*s). Statistical analyses were performed using R software (version 4.4.2).

Results

Descriptive Statistics

The analytical sample included 574 participants with a mean (SD) age of 69.90 (5.71) years. Most participants were female (58.36%, n = 335), were of Han ethnicity (99.65%, n = 572), had achieved a middle school education (31.53%, n = 181), were farmers (60.63%, n = 348), lived in urban communities (53.83%, n = 309), resided locally within their city (district) (97.91%, n = 562), were unemployed (84.49%, n = 485), did not live alone (85.37%, n = 490), had a medical insurance (98.08%, n = 563), and had a personal monthly income of <2000 Chinese Yuan (CNY) (64.81%, n = 372).

Of the total participants, 260 (45.30%) had hypertension, with 250 (96.15%) managed in the community. Diabetes was present in 104 (18.12%) participants, of whom 96 (92.31%) were managed in the community. Among all older adults, 4 (0.70%) and 13 (2.26%) self-reported physician-diagnosed COPD and bronchitis, respectively. As for vaccination status, 130 (22.65%) participants self-reported having ever received the influenza vaccine, 14 (2.44%) self-reported having received the pneumococcal vaccine, and 12 (2.09%) self-reported having received the herpes-zoster vaccine.

The mean (SD) scores for depression, anxiety, loneliness, and social support among participants were 1.49 (2.78), 0.90 (2.21), 0.53 (1.37), and 78.41 (25.54), respectively. Regarding the suicidal ideation, 572 (99.65%) participants reported "no" in the past six months, while 2 (0.35%) reported "yes". In total, 116 (20.21%) participants were aware of COPD, and 412 (71.78%) expressed an intention to undergo screening (Table 1).

Association Results

Participants who had not completed primary school (*OR* = 2.551, 95% *CI*: 1.102–6.072), had a middle school education (*OR* = 2.774, 95% *CI*: 1.405–5.906), had a high school education or above (*OR* = 4.522, 95% *CI*: 2.198–9.947), or had a personal monthly income of ≥4000 CNY (*OR* = 2.941, 95% *CI*: 1.727–4.966) were positively associated with COPD awareness. In contrast, living in rural areas (*OR* = 0.428, 95% *CI*: 0.274–0.658) or being currently employed (*OR* = 0.246, 95% *CI*: 0.094–0.535) were negatively associated with COPD awareness. Individuals aged 70–79 years (*OR* = 1.498, 95% *CI*: 1.025–2.201) or those residing in rural areas (*OR* = 1.512, 95% *CI*: 1.046–2.196) showed a greater willingness to be screened for COPD when experiencing respiratory symptoms, whereas a personal monthly income ≥4000 CNY (*OR* = 0.586, 95% *CI*: 0.355–0.980) was associated with a lower willingness to undergo screening (Table 2).

Self-reported receipt of the influenza, pneumococcal, or herpes-zoster vaccine (*OR* = 2.221, 95% *CI*: 1.426–3.437) was also positively associated with COPD awareness. Older adults with hypertension, diabetes, or both (*OR* = 1.467, 95% *CI*: 1.019–2.117), those receiving community-based chronic disease management (*OR* = 1.547, 95% *CI*: 1.073–2.241), or those who self-reported having received any of the three vaccines (*OR* = 1.583, 95% *CI*: 1.017–2.523) were more willing to be screened for COPD. However, depression, anxiety, loneliness, and social support were not statistically associated with either COPD awareness or screening intention (Table 3).

Table 1 Characteristics of Older Adults in Jiangsu and Shandong Provinces, China

Variables	n (%)
Socio-demographic characteristics	
Age (years, mean ± SD)	69.90 ± 5.71
Age group (years)	
60–69	294 (51.22)
70–79	250 (43.55)
≥ 80	30 (5.23)
Sex	
Male	239 (41.64)
Female	335 (58.36)
Ethnicity	
Han	572 (99.65)
Non-Han	2 (0.35)
Education	
No education	112 (19.51)
Not completed primary school	69 (12.02)
Primary school	112 (19.51)
Middle school	181 (31.53)
High school / Vocational school / Technical school	80 (13.94)
Undergraduate education	14 (2.44)
Postgraduate education or above	6 (1.05)
Occupation	
Healthcare professionals	4 (0.70)
Farmers (Agricultural Workers)	348 (60.63)
Government and other public institution staff	37 (6.44)
Corporate employees	118 (20.56)
Self-employed individuals	43 (7.49)
Other	24 (4.18)
Residence	
Urban	309 (53.83)
Rural	265 (46.17)
Household registration	
Within the same city(district)	562 (97.91)
Within the same province(municipality) but different city(district)	11 (1.92)
Other provinces (autonomous regions, municipalities)	1 (0.17)
Working days per week (days)	
0	485 (84.49)
1-3	28 (4.88)
4-7	61 (10.63)
Live alone (Yes)	84 (14.63)
Medical insurance (Yes)	563 (98.08)
Personal monthly income* (CNY)	
< 2000	372 (64.81)
2000-3999	120 (20.91)
4000-8000	74 (12.89)
> 8000	8 (1.39)

(*Continued*)

Table 1 (Continued).

Variables	n (%)
Physical health	
Hypertension (Yes)	260 (45.30)
Diabetes (Yes)	104 (18.12)
Any of the above chronic diseases (Yes)	298 (51.92)
COPD (Yes)	4 (0.70)
Bronchitis (Yes)	13 (2.26)
Healthcare utilization	
Hypertension management in the community (Yes)	250 (96.15)
Diabetes management in the community (Yes)	96 (92.31)
Any of the above disease management in the community (Yes)	282 (94.63)
History of influenza vaccination (Yes)	130 (22.65)
History of pneumococcal vaccination (Yes)	14 (2.44)
History of herpes-zoster vaccination (Yes)	12 (2.09)
Any of the above vaccinations (Yes)	139 (24.22)
Mental health	
Depression[†] (Mean ± SD)	1.49 ± 2.78
Anxiety[†] (Mean ± SD)	0.90 ± 2.21
Loneliness (Mean ± SD)	0.53 ± 1.37
Social support (Mean ± SD)	78.41 ± 25.54
Outcome variables	
COPD awareness	
No	458 (79.79)
Yes	116 (20.21)
Screening intention	
No	162 (28.22)
Strongly disagree	6 (1.05)
Disagree	43 (7.49)
Neutral	113 (19.69)
Yes	412 (71.78)
Strongly agree	118 (20.56)
Agree	294 (51.22)

Note: *In the past year. [†]In the past two weeks.
Abbreviations: SD, standard deviation; CNY, Chinese Yuan; COPD, chronic obstructive pulmonary disease.

Discussion

In this population-based cross-sectional study of 574 community-dwelling older adults from Jiangsu and Shandong provinces, China, we investigated the prevalence of and factors associated with COPD awareness and screening intention, an area with limited prior research.

Our findings showed that COPD awareness remains low, whereas screening intention is relatively high. Existing evidence has indicated an increase in COPD awareness rates among community-dwelling older adults in China, from 1.87% in 2013 to an estimated 19.75% in 2023 based on published data,[7,8] and our study further found a comparable rate of 20.21% in 2025. Importantly, poor awareness may hinder symptom recognition and delay healthcare-seeking behavior, which in turn contributes to late diagnosis and suboptimal outcomes. As for screening intention, previous research reported a rate of 79.69%,[8] while our study observed a rate of 71.78%, and these differences may reflect heterogeneity in study populations, geographic settings, and survey time periods.

Table 2 Associations of Socio-Demographic Characteristics with COPD Awareness and Screening Intention Among Older Chinese Adults

Socio-Demographic Characteristics	COPD Awareness			Screening Intention		
	OR_u	95% *CI*		OR_u	95% *CI*	
		Lower Limit	Upper Limit		Lower Limit	Upper Limit
Age (years)	0.986	0.951	1.022	1.023	0.991	1.057
Age group (years)						
60–69	1.000	1.000	1.000	1.000	1.000	1.000
70–79	0.999	0.656	1.518	**1.498**	1.025	2.201
≥ 80	0.780	0.255	1.968	0.925	0.425	2.134
Sex						
Male	1.000	1.000	1.000	1.000	1.000	1.000
Female	0.969	0.643	1.470	0.884	0.609	1.279
Education						
No education	1.000	1.000	1.000	1.000	1.000	1.000
No completed primary school	**2.551**	1.102	6.072	1.705	0.862	3.496
Primary school	1.420	0.625	3.318	1.356	0.761	2.432
Middle school	**2.774**	1.405	5.906	1.175	0.702	1.955
High school or above	**4.522**	2.198	9.947	1.105	0.617	1.988
Residence						
Urban	1.000	1.000	1.000	1.000	1.000	1.000
Rural	**0.428**	0.274	0.658	**1.512**	1.046	2.196
Employment						
No	1.000	1.000	1.000	1.000	1.000	1.000
Yes	**0.246**	0.094	0.535	1.153	0.699	1.961
Live alone						
No	1.000	1.000	1.000	1.000	1.000	1.000
Yes	0.619	0.309	1.143	0.916	0.557	1.543
Medical insurance						
No	1.000	1.000	1.000	1.000	1.000	1.000
Yes	2.567	0.484	47.351	1.465	0.379	4.919
Personal monthly income* (CNY)						
< 2000	1.000	1.000	1.000	1.000	1.000	1.000
2000–3999	1.342	0.788	2.233	0.730	0.467	1.152
≥ 4000	**2.941**	1.727	4.966	**0.586**	0.355	0.980

Notes: *In the past year. Bold values indicate statistically significant associations (Ps < 0.05).
Abbreviations: COPD, chronic obstructive pulmonary disease; OR_u, unadjusted odds ratio; CI, confidence interval; CNY, Chinese Yuan.

Higher education and income were positively associated with COPD awareness, which may partially explain previously reported socioeconomic disparities in COPD prevalence.[12,13] Interestingly, older adults with higher income showed lower intention to be screened for COPD, possibly due to higher expectations for screening quality. Urban residents demonstrated better COPD awareness compared to their rural counterparts, consistent with findings from prior studies on other chronic diseases such as hypertension.[14] However, older adults living in rural areas were more willing to be screened for COPD, which is potentially related to variations in health perceptions and access to health information.

This study indicated that COPD awareness was lower among older adults who were still working, likely reflecting occupational stress and responsibilities that take precedence over disease prevention, particularly when COPD symptoms are not evident. We also found that individuals aged 70–79 years had a higher intention to be screened than those aged 60–69 or ≥80 years, which contrasts with findings by Du et al, who reported higher participation rates among the oldest seniors,[15] and this discrepancy may be attributed to differences in mobility and other age-related factors.

Older adults with hypertension, diabetes, or both were more likely to participate in COPD screening aligns with earlier research, suggesting that individuals with chronic conditions are more sensitive to health risks.[16] This may be

Table 3 Associations of Physical Health, Healthcare Utilization, Mental Health, and Social Support with COPD Awareness and Screening Intention Among Older Chinese Adults

Variables	COPD Awareness			Screening Intention		
	OR_u	95% *CI*		OR_u	95% *CI*	
		Lower Limit	Upper Limit		Lower Limit	Upper Limit
Physical health						
Either hypertension or diabetes, or both						
No	1.000	1.000	1.000	1.000	1.000	1.000
Yes	1.080	0.718	1.628	**1.467**	1.019	2.117
Healthcare utilization						
Either hypertension or diabetes, or both management in the community						
No	1.000	1.000	1.000	1.000	1.000	1.000
Yes	1.242	0.826	1.872	**1.547**	1.073	2.241
Influenza vaccine, pneumococcal vaccine, or herpes-zoster vaccine						
No	1.000	1.000	1.000	1.000	1.000	1.000
Yes	**2.221**	1.426	3.437	**1.583**	1.017	2.523
Mental health						
Depression*	0.970	0.891	1.045	1.000	0.938	1.071
Anxiety*	0.957	0.856	1.052	1.004	0.927	1.096
Loneliness	0.913	0.760	1.068	0.994	0.874	1.141
Social support	0.997	0.989	1.005	1.003	0.996	1.010

Notes: *In the past two weeks. Bold values indicate statistically significant associations (Ps < 0.05).
Abbreviations: COPD, chronic obstructive pulmonary disease; OR_u, unadjusted odds ratio; CI, confidence interval.

because the experience of managing chronic illness increases motivation for early screening and diagnosis. Additionally, those who had utilized healthcare services had higher COPD awareness and greater screening intention, likely due to increased health education and enhanced health literacy through contact with healthcare professionals.[17]

Interestingly, we also observed that depression, anxiety, loneliness, and social support were not linked to either COPD awareness or screening intention. Compared with previous study among Chinese older adults using the same validated scales,[18] our participants demonstrated a relatively favorable psychosocial status, suggesting that the lack of association was unlikely to be primarily driven by adverse psychosocial conditions. Instead, the generally low level of COPD recognition in the study population may have limited the extent to which psychosocial factors influenced health-related perceptions and screening intentions.

Several limitations of this study should be acknowledged. First, due to the cross-sectional study design, causality cannot be established, and only associations can be inferred. Second, all reported associations were derived from univariable binary logistic regression and therefore represent unadjusted associations that may be subject to residual confounding. Third, although candidate predictors were selected based on existing literature and theoretical considerations, some potentially important factors may not have been captured due to the lack of a comprehensive conceptual framework. Fourth, data were collected through face-to-face interviews using a structured questionnaire, which may have introduced information bias. Fifth, participants were recruited from specific regions, limiting the generalizability of the findings to the broader population of older adults in China.

Conclusions

Our study provides novel evidence that Chinese elderly have low COPD awareness but a relatively high screening intention, and identifies socio-demographic characteristics, physical health, and healthcare utilization as important

associated factors. Among these, healthcare services could serve as a feasible platform for enhancing COPD awareness and promoting screening intention in this vulnerable population. Future research should focus on developing and evaluating targeted interventions to achieve this goal.

Ethical Statement

The study protocol was approved by the Ethics Commission of Peking University Health Science Centre (IRB00001052-24090), written informed consent was obtained from all participants, and each procedure was performed in accordance with the Declaration of Helsinki.

Acknowledgments

We expressed our sincere appreciation to study participants and research staff who made great efforts during the field investigation.

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.

Funding

This study was supported by the Joint Research Fund for Beijing Natural Science Foundation and Haidian Original Innovation Program (L222029).

Disclosure

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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