

Difficulties in Quitting Smoking in the Face of COPD in Rural Populations in China

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Abstract. Chronic Obstructive Pulmonary Disease (COPD) represents a critical public health issue in China, with a huge burden falling upon the vast rural populations. COPD may result from the long-term interaction of multiple risk factors, including smoking, occupational or environmental dust, air pollution, infections, and airway hyper-responsiveness, but smoking remains the most significant modifiable risk factor for the development and progression of COPD. This report provides a comprehensive, in-depth analysis of the multifaceted difficulties in achieving smoking cessation among rural populations facing COPD, viewed from the social and behavioral perspective. Through literature review, this report reveals that smoking cessation is not merely a medical challenge but a socio-behavioral dilemma. Major barriers include low health literacy and awareness; social norms that valorize smoking as a tool for social bonds; socioeconomic disparities; nicotine addiction; and the psychological burden and healthcare system barriers. The study proposes potentially effective interventions, such as community-based programs and digital smoking cessation support.

Keywords: COPD, smoking cessation, social, behavioral and psychological factors, rural populations

1. Introduction

In China, Chronic Obstructive Pulmonary Disease (COPD) constitutes a major public health challenge, most visibly across the country's extensive rural population, where both disease prevalence and overall burden remain high [1]. COPD is one of the most important causes of morbidity and mortality globally. When facing exposure to noxious particles or gases, the typical clinical manifestations of COPD, including persistent respiratory symptoms and airflow limitation, will become apparent [2]. In epidemiological studies on COPD, there is a very high urban-rural gap among COPD patients in China, with rural populations accounting for higher proportions in terms of prevalence, morbidity, and mortality [3]. Closely tied to this difference is the high prevalence of tobacco smoking in these areas, which has consistently been identified as the main risk factor for the disease [4]. Quitting smoking can significantly slow disease progression, alleviate patients' clinical symptoms, and play a positive role in the prevention of COPD. Yet for rural populations, quitting is rarely straightforward; rather, it is constrained by a dense mix of social, physical, behavioral, and psychological impediments. By employing literature review and survey analysis, this study analyzes the multifactorial barriers that shape smoking cessation among rural Chinese COPD patients. This

study aims to protect respiratory health and offer hope to patients with COPD in rural areas across the country, as well as to support the strategic goals of "Healthy China 2030."

2. Social, behavioral and psychological factors

2.1. Low health literacy and awareness

A pervasive issue in rural settings is low health literacy, which limits awareness of COPD as a preventable disease [5, 6]. Early symptoms such as cough, phlegm production, and shortness of breath are frequently construed by many patients as ordinary byproducts of aging or physical exertion rather than the hazards associated with prolonged smoking. The urgency and necessity of smoking cessation may be underestimated. This cognitive bias prevents many patients from fully committing to smoking cessation even after a formal diagnosis has been delivered. A related misconception also appears with some frequency: after many years of smoking, certain patients assume that cessation has come too late or that stopping abruptly would itself provoke serious illness or even death [7]. In practical terms, such misunderstandings erode the intrinsic motivation needed for quitting. Insufficient awareness of the harms of smoking and the benefits of smoking cessation reduces the likelihood of actively quitting smoking and of preventing COPD.

2.2. Cultural acceptance of tobacco

Given the current situation in China, the proportion of smokers relative to the total population is relatively high by international standards. As a traditional form of social interaction, smoking has become normalized and is an indispensable part of rural social life, commonly found in everyday social interactions and leisure activities. Across rural China, a distinctive "cigarette culture" remains deeply embedded in everyday social life. Cigarettes, serving as a social medium, are widely used to maintain interpersonal relationships, express respect, and ease social awkwardness [7, 8]. Within a cultural milieu often captured by the phrase "no cigarettes, no socializing," the act of quitting entails more than overcoming nicotine dependence alone; equally, it requires withstanding intense pressure exerted through the surrounding social network. During culturally salient occasions—including festivals, weddings, funerals, and the Lunar New Year—the offering and sharing of cigarettes are commonly treated as etiquette in practice; refusing a cigarette may be interpreted as being unsociable or even discourteous [8]. Within such a social environment, smoking cessation becomes markedly harder, especially for patients with COPD. Even if they are determined to quit, they often relapse in social situations. In many rural areas, meanwhile, entertainment and recreational resources remain limited, with the result that smoking has become a readily accessible and often dominant form of leisure through which residents occupy spare time, making it more difficult for them to achieve smoking cessation [9, 10].

2.3. Socioeconomic disparities

Socioeconomic status (SES) plays a critical role in COPD prevalence, diagnosis, and treatment in rural China [11]. Widely recognized as a social determinant of respiratory health, lower socioeconomic status has repeatedly been verified—across global populations—as an independent risk factor for both the onset and progression of COPD. Existing empirical studies further confirm that socioeconomic disparities significantly shape the epidemiological trends of COPD and aggravate the corresponding disease-related economic burden in rural southwest China [11].

Compared with urban residents, rural populations are more likely to engage in high-risk health behaviors, among which the high prevalence of tobacco use is particularly prominent and serves as a major driver of the local COPD burden. They may find themselves in social groups where smoking is the norm and lack social relationships that provide timely discouragement of smoking or support for quitting together. Meanwhile, most rural households face difficult economic conditions. After a COPD diagnosis, patients usually have to cover both direct and indirect costs. This can add financial pressure that may lower the smoking cessation rate [11]. In rural areas, basic living expenses usually come first. As a result, extra spending on professional smoking cessation aids, such as prescription cessation medications, may be seen as too risky, which helps explain the low rate of actual participation in professional smoking cessation treatment among rural COPD patients.

2.4. Nicotine addiction

Nicotine addiction is a complex clinical manifestation. It is deplorable that there are very few consultation services related to nicotine replacement in rural areas. Interventions based on individual circumstances tend to be more likely to show effective results when COPD patients are confronted with different factors about smoking cessation [12]. Nicotine addiction is often accompanied by a decline in self-control. When immediate gratification from smoking is weighed against the longer-term benefits of quitting, the timely relaxation behaviors that can relieve fatigue become more alluring. The preference of the brain reward system for nicotine largely adds another barrier to cessation [13]. Quitting smoking can also be physically painful. People who try to quit may experience withdrawal symptoms that make it harder to remain smoke-free, especially respiratory discomfort and general physical distress. Few are the patients who can persist when symptoms such as hypersalivation, fever, and rhinorrhea take turns afflicting their bodies [7, 14].

2.5. The psychological problem

Influenced by rural traditions or religious beliefs, some rural COPD patients may believe most events are predetermined. When this belief is applied to health, it can manifest as a fatalistic resignation to illness [14]. A rural COPD patient, for example, may reason that a lifetime of smoking has already caused irreversible harm and that quitting now would serve no meaningful purpose. This mindset fundamentally undermines the motivation required for a difficult behavioral change like smoking cessation. For smoking cessation, determination is indispensable. Among smokers with COPD, repeated prior failures to quit often give rise to learned helplessness. Over time, they may come to see themselves as inherently incapable of quitting. Such a belief eventually erodes their self-confidence, and, in turn, they are less likely to initiate a quit attempt. Even when they start to try, less effort may be put in smoking cessation [7].

2.6. Healthcare system barriers

The healthcare system also poses significant obstacles for rural populations. Among smokers residing in rural communities, access to formal cessation support often remains limited, with conditions that create barriers to obtaining professional guidance, so the motivation to quit is weakened [15]. In rural settings, healthcare infrastructure is often under-resourced, with primary care clinics lacking the trained personnel, time, and protocols to deliver effective behavioral counseling for smoking cessation. Similarly constrained is the use of smoking cessation pharmacotherapy in rural China, where such medications are available only intermittently and are

prescribed at low rates [16]. For rural populations, distance and transportation costs also pose significant barriers. If rural residents travel specifically to urban hospitals for professional smoking cessation treatment, they often spend considerable time traveling back and forth. Rural residents may also be bothered by additional transportation costs. For farming households whose primary source of income is agriculture, these transportation costs, combined with lost wages due to missed work, come close to a full day's household income. For many rural smokers with COPD, that cost is too high, so they give up on seeking medical help to stop smoking. Fortunately, in recent years, the governments have extended more high-quality medical resources to village-level medical institutions. These efforts have created favorable conditions for rural populations to obtain professional smoking cessation guidance and nearby [11].

3. Interventions

3.1. Community-based programs

The choice of community activities holds extraordinary significance for quitting smoking. Sedentary recreational activities, such as mahjong and board games, are often accompanied by a fixed social environment that encourages smoking, which can make relapse extremely easy. In contrast, physical activities such as group dancing, outdoor exercises, and qigong can help rural residents develop healthier living habits and thereby reduce their participation in smoking-related activities. As a result, the risk of re-smoking is lowered [10, 17]. At the level of daily social interaction, this approach may help interrupt the cycle of smoking and offer a practical way to improve smoking patterns among rural residents while supporting grassroots tobacco control efforts. Another promising initiative is to hold more lectures about COPD and carry out effective intervention programs in grassroots communities and rural residential settlements rather than just in cities or hospitals. This will be conducive to promoting smoking cessation and disease management services to rural populations. By delivering health services closer to people's daily living environments, community-based intervention programs can significantly lower the time, transportation and economic costs of seeking medical help for rural residents. Meanwhile, such community-led initiatives are better tailored to local cultural norms, lifestyle habits and social communication patterns in rural areas. Compared with formal urban healthcare facilities, these community-based initiatives are usually easier for local populations to reach. A landmark example is the 18-year cluster-randomized trial of a rural community-based integrated intervention for COPD in China [9]. However, community-based programs may encounter difficulties in implementation due to the lack of entertainment resources or the low willingness of rural residents to participate.

3.2. Quitting smoking with digital support

In rural areas, implementing offline smoking cessation often faces geographical difficulties. At such times, the WeChat-based program, relying on its practicality and low cost, finds its place. As a popular social media platform in rural areas, WeChat offers a convenient way to deliver smoking interventions through tailored messages and behavioral guidance based on the Transtheoretical Model. Although rural smokers showed better overall quitting outcomes, the WeChat-based digital intervention was statistically significant for urban participants. For this method to work better in rural populations, future programs should adapt digital intervention content to local cultural norms. They also need to match rural health literacy levels and everyday routines. Just relying on this

program may not be enough. Combining online tools with offline, community-based guidance would likely make smoking cessation programs more practical in rural areas [15].

Early identification, diagnosis, and intervention are of great importance for COPD. The application of artificial intelligence can handle this problem from an earlier timeline, which can help some individuals stop smoking sooner. It may also help prevent respiratory disease through strengthening tobacco control in a timely manner. An explainable artificial intelligence framework can accurately identify smokers at high risk of COPD. This gives clinical smoking cessation counseling and related health interventions a clearer evidence-based basis, which may make them more targeted and persuasive [18]. When smokers are persuaded by ordinary people to quit smoking, they may remain indifferent. However, when faced with the objective prediction results of artificial intelligence, they may truly worry about their health conditions. This intelligent risk assessment model can be very useful because of its practical value for implementation in rural areas.

In rural areas, some people, especially the elderly, may not be proficient in using electronic devices, which greatly reduces the effectiveness of digital support. Family members are therefore required to provide guidance and assistance. Additionally, some rural residents are vigilant about new things. This digital divide has hindered the implementation of digital support among rural populations, and it may require active promotion and guidance from medical staff and community health volunteers.

4. Conclusion

This study analyzes the difficulties of quitting smoking faced by rural populations with COPD from social and behavioral perspectives. It turns out that the low smoking cessation rate in rural areas is closely related to social, behavioral, and psychological factors. By elucidating the association between COPD and the low smoking cessation rate among rural populations and proposing potential intervention strategies, this study fills a gap in previous research, which either focused solely on the causes of COPD or treated low smoking cessation rates as an isolated phenomenon, without examining the two as a unified whole to reveal their underlying connection.

At the practical level, recommendations were made on how to strengthen smoking cessation services in rural areas. Through community health program, the goal is to promote healthy and positive scientific concepts and encourage rural residents to quit smoking on their own initiative. The recommendations also suggest utilizing new technologies, such as artificial intelligence, to both reduce rural residents' exposure to cigarettes and strengthen their motivation to quit.

This study also has several limitations. It relies on existing literature and does not include original data collection, field surveys, or primary data analysis. The study also treats smoking as the only risk factor and does not examine other factors linked to COPD, including insufficient access to exercise facilities and indoor or outdoor air pollution in rural areas. Future research will address these gaps through more targeted study designs. For example, cohort studies or case-control studies will be designed to collect and analyze the medical record data and past medical histories of more patients at primary hospitals. Personalized interviews will be conducted with patients and medical staff. Meanwhile, a more in-depth exploration of other risk factors for COPD will be carried out. Based on the above analysis, this study confirms that multiple factors at the social, behavioral, and psychological levels can lead to a decline in the smoking cessation rate in rural populations and increase the risk of COPD. This public health issue requires urgent attention, and it is hoped that this study can help improve this situation.

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