RESEARCH

Experiences of patient delay among lung cancer patients in South China

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Abstract

Background Lung cancer is a commonly diagnosed cancer and the leading cause of cancer-related mortality worldwide. Cancer delay pose significant challenges for health systems globally, with patient delay being a primary factor contributing to late diagnoses, ultimately resulting in adverse outcomes and reduced survival rates. However, the underlying reasons for patient delay are not well understood, and there is a scarcity of studies that specifically examine the experiences related to patient delay among lung cancer patients. Therefore, this study aims to explore the experiences of lung cancer patients and identify potential strategies to mitigate their delays in seeking care.

Methods The interview framework was developed based on the Theory of Planned Behavior. Face-to-face semi-structured interviews were conducted with participants. Data analysis was performed using Colaizzi's phenomenological analysis method.

Results A total of 30 lung cancer patients participated in the interviews, which lasted between 26 and 42 min (with an average duration of 33 min). The duration of patient delay varied from 90 to 213 days. Four themes were identified: (1) reasons for patient delay, (2) health-seeking triggers, (3) perception of patient delay, and (4) potential solutions.

Conclusion Lung cancer patients exhibited varying degrees of patient delay attributed to factors such as ignoring or dismissing symptoms, lack of family support, poor access to health services, and the COVID-19 pandemic. Promoting disease knowledge, optimizing resources and implementing technology-based solutions may serve as effective measures to address these issues.

Keywords Lung cancer, Patient delay, Disease knowledge, Resource optimization

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Introduction

Lung cancer is one of the most frequently diagnosed cancers worldwide, with an estimated two million new cases reported annually [1]. According to the World Cancer Research Fund and the American Institute for Cancer Research (http://www.wcrf.org), lung cancer was identified as the second most common cancer in 2020, accounting for 2.2 million new cases globally, which represents 12.2% of all newly diagnosed cancers. In this context, China ranked sixteenth with 815,563 new cases, reflecting an age-standardized incidence rate of 35.1 per 100,000 individuals. Furthermore, lung cancer emerged as the leading cause of cancer-related mortality, responsible for nearly one in five deaths attributed to cancer. It is estimated that approximately

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1.8 million people succumbed to lung cancer worldwide in 2020 [2], with China alone contributing to 714,699 fatalities—accounting for a significant 39.8% of global lung cancer deaths [2]. Public health initiatives aimed at reducing smoking rates and comprehensive strategies designed to enhance protective factors have led to a decline in lung cancer incidence within high-income countries [3, 4]. However, there remains a concerning upward trend in new diagnoses of lung cancer within developing nations where public health efforts focused on smoking cessation are insufficient and access to healthcare services is neither inadequate nor inequitable [3, 5].

Although early detection and treatment of cancer are highly desirable, cancer delay pose significant concerns for healthcare systems worldwide [6]. These delays can be categorized into patient, referral, or treatment delays. Patient delay specifically refers to the interval between the onset of symptoms or signs and the subsequent consultation with a healthcare provider [7]. This delay is associated with tumor progression and upstaging, leading to poorer outcomes, reduced survival rates, and/or functional impairment [8]. Early diagnosis is particularly crucial for lung cancer management as it correlates with improved survival rates [9], whereas delayed diagnosis often results in adverse outcomes. A patient delay exceeding 90 days is recognized as a risk factor for advanced-stage diagnoses [10] and represents a substantial barrier to achieving global lung cancer targets in developing countries [11–13]. However, the underlying reasons for patient delays in lung cancer have not been thoroughly understood. Therefore, it is imperative to investigate patients' initial experiences and reactions upon developing symptoms of lung cancer while identifying factors that influence their decision-making regarding consultations with healthcare professionals.

The Theory of Planned Behavior (TPB) [14] is a well-established psychological theory that examines how information processing influences behavior, predicts individual behavioral intentions, and explains decision-making processes. The theory encompasses various aspects, including attitudes, subjective norms, and perceived behavioral control [15]. It is particularly useful for studying the reasons behind delayed medical care for patients with lung cancer. To explore this further, we created an interview framework based on the TPB and conducted in-depth, semi-structured interviews with 30 lung cancer patients. Our aim was to gain insight into their personal experiences and identify potential strategies to reduce patient delay, ultimately improving the prognosis and survival rates for lung cancer patients.

Methods

Study design
A qualitative descriptive study using semi-structured interviews was conducted.

Setting
This study was conducted in the Pulmonary and Critical Care Medicine Ward I of the First Hospital of Guangxi Medical University in Nanning from April 2021 to December 2021. The hospital is one of the most acclaimed general hospitals in South China, and the department admits people with lung cancer from all over the country and provides medical services for them.

Sampling and recruitment
The participants for this research were selected using a maximum variation sampling method. To ensure the inclusion of a diverse patient sample, we established a sampling frame based on gender and recruited an equal number of male and female participants. Subsequently, we categorized them by age (<60 years and ≥60 years) and recruited an equivalent number of patients from each group. The inclusion criteria for the participants were as follows: (1) being 18 years or older, (2) being aware of their lung cancer diagnosis, (3) visiting the hospital for treatment at least 90 days after the onset of symptoms or signs, (4) being able to speak Mandarin clearly, and (5) providing written informed consent. Participants were excluded if they: (1) could not recall their symptom onset date or when they initially visited the hospital for treatment, or (2) were extremely frail and unable to participate in the interview. The sample size was determined based on an estimation of the number of patients needed to reach data saturation, which is when no additional issues are identified and the codebook begins to stabilize. To ensure triangulation and rigor in the analytic approach, transcripts were read by two researchers (Luo YX and Jiang DD) and re-read for the purposes of familiarization; looking for emergent and recurrent concepts. Appraisal across data was compared and contrasted to establish common codes. Codes were then applied back across the data to ensure that no new codes or concepts were apparent, such that a level of data saturation was reached. In addition, through an iterative process of patient interviews analysis, no new themes were apparent with subsequent interviews, suggesting a sufficient sample size for thematic saturation [16]. After interviewing and analyzing the data of 30 patients, the research team determined that the codebook had stabilized and ceased data collection.

The three authors (Jiang.DD., Li.HY., and Liu.JM.) approached potential participants during clinical practice, explained the purpose and procedures of the study,

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and invited them to participate. All the contacted participants agreed to participate in the interviews.

Interview outline development

The Theory of Planned Behavior (TPB) serves as a valuable framework for enhancing understanding of the mechanisms underlying help-seeking behavior among individuals with lung cancer. This theory posits three primary factors that influence an individual's behavioral intention, which in turn affects the manifestation of the final behavior. These factors include attitude towards the behavior, subjective norm, and perceived behavioral control [17]. We created a preliminary interview outline in line with the study's purpose based on TPB, then refined it through pilot interviews with three patients. The interview outline consists of ten questions, detailed in Supplementary Table 1.

Data collection

Semi-structured interviews were arranged at the participants' preferred times and locations, typically in the afternoon in an empty consulting room. The interviews featured open-ended questions based on the predefined outline. Conducted by the first author(Jiang DD), a female nursing graduate student experienced in lung cancer care and qualitative research, the interviews included only the participants and researchers, with no repeat sessions. Each interview was audio-recorded and transcribed verbatim in Mandarin, with key points noted. Transcripts were returned to participants for review and correction.

Data analysis

The recording and interview notes were transcribed within 24 h after each session according to the thematic analysis method [18] using Nvivo 11.0 software. The first author(Jiang DD) read and coded the interview transcripts, creating an initial codebook. Similar codes were grouped into categories, which were then organized into broader themes. The coding team, consisting of the first author, two nursing graduate students, and an associate professor with expertise in lung cancer care and qualitative methods, discussed and revised the codebook during weekly meetings until consensus was achieved. The corresponding author (Luo YX) translated the transcripts, codes, categories, and themes into English following established translation procedures [19]. The study materials were then back-translated and reviewed for accuracy by a nursing researcher who has studied in an English-speaking country for over two years. Data is presented following the consolidated criteria for reporting qualitative research (COREQ) [20]. The COREQ checklist can be found in the supplemental materials.

Ethical considerations

This study was approved by the Ethics Committee of the First Hospital of Guangxi Medical University (Approval No.2021-12). Each participant was assigned a number to protect their anonymity, and informed consent to participate was obtained from all the participants in the study.

Results

Thirty participants completed the interviews, aged 32 to 78 years. Ten were urban residents, while twenty lived in rural areas. Eleven had completed primary school, four earned an undergraduate degree, and the rest finished junior or senior high school. Their occupations included street cleaners, laborers, farmers, teachers, babysitters, and clerks; one was retired, three self-employed, and the rest unemployed. The most common symptoms were cough and expectoration, followed by chest tightness, fatigue, and hoarseness. Detailed information on lung cancer type, disease stage, and patient delay duration is available in Table 1.

Interviews lasted between 26 and 42 min, averaging 33 min, with patient delay durations ranging from 90 to 213 days. Four themes emerged: (1) reasons for patient delay, (2) health-seeking triggers, (3) perceptions of patient delay, and (4) potential solutions. These themes and their subthemes are outlined in Table 2.

Theme one: reasons for patient delay

Participants cited multiple reasons for not seeking medical consultation upon experiencing initial symptoms, encompassing subjective and objective factors, as well as active and passive ones. Four sub-themes emerged from their descriptions: ignoring or dismissing symptoms, lack of family support, poor access to healthcare services, and the impact of the COVID-19 pandemic.

Ignore or dismiss symptoms

A common sub-theme among participants was the tendency to ignore or dismiss symptoms. Many initially experienced lung cancer symptoms like coughing, fatigue, and expectoration, misinterpreting them as a cold or minor issue they could handle themselves. Consequently, they delayed seeking medical help until the condition worsened.

> *"At first, I just had a cough and felt really tired; I thought it was just a cold that would go away on its own. I never expected things to get so bad so fast; if I had, I definitely would have gone to see a doctor."* (P1).

> *"About four months ago, I noticed my voice was get-*

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Table 1 Demographics, tumour details information and duration of patient delay(*n* = 30)

Patients ID	Gender	Age(years)	Living area	Education level	Occupation	Primary symptom	Type of lung cancer	Stage of disease	Duration of patient delay (days)	Ethnicity	Marital status
P1	female	62	town	Primary school	Street cleaner	Cough	Squamous cell carcinoma	IIIa	150	Han	Married
P2	female	53	town	junior high school	worker	Cough	Adenocarcinoma	IIIb	92	Zhuang	Married
P3	male	72	rural	Primary school	farmer	Expectoration	Adenocarcinoma	IV	120	Zhuang	Widowed
P4	female	49	rural	junior high school	farmer	fatigue	Adenocarcinoma	IV	100	Han	Married
P5	female	36	town	undergraduate	teacher	chest tightness	Adenocarcinoma	IIIa	160	Han	Single
P6	male	66	town	undergraduate	retirement	Cough	Squamous cell carcinoma	IV	110	Zhuang	Married
P7	female	32	town	undergraduate	worker	Chest pain	Small cell carcinoma	Extensive stage	90	Han	Married
P8	male	60	rural	junior high school	self-employed	Cough	Squamous cell carcinoma	IIIb	125	Han	Married
P9	male	65	rural	Primary school	farmer	hoarse voice	Squamous cell carcinoma	IV	130	Han	Divorced
P10	male	43	town	senior middle school	worker	Cough and expectoration	Adenocarcinoma	IIIb	105	Han	Single
P11	female	78	town	junior high school	unemployed	Cough and expectoration	Adenocarcinoma	IV	135	Han	Widowed
P12	female	58	rural	senior middle school	unemployed	Cough and expectoration	Adenocarcinoma	IIIa	120	Han	Married
P13	male	62	rural	Primary school	farmer	fatigue	Adenocarcinoma	IIIb	98	Zhuang	Widowed
P14	female	46	rural	junior high school	worker	chest tightness	Small cell carcinoma	Extensive stage	110	Yao	Married
P15	female	60	rural	Primary school	farmer	Cough and expectoration	Adenocarcinoma	IIIa	105	Han	Married
P16	female	41	rural	junior high school	unemployed	Cough	Adenocarcinoma	IV	91	Zhuang	Married
P17	male	62	town	junior high school	self-employed	hoarse voice	Adenocarcinoma	IV	120	Han	Married
P18	male	57	rural	Primary school	farmer	fatigue	Adenocarcinoma	IIIa	213	Han	Married
P19	female	72	rural	Primary school	farmer	chest tightness	Adenocarcinoma	IV	125	Han	Widowed
P20	male	48	rural	junior high school	worker	Cough	Squamous cell carcinoma	IIIa	90	Zhuang	Married
P21	female	56	town	Primary school	babysitter	chest tightness	Adenocarcinoma	IV	90	Han	Married
P22	male	50	rural	junior high school	farmer	Cough	Adenocarcinoma	IIIb	95	Zhuang	Married
P23	female	69	rural	Primary school	farmer	Cough	Adenocarcinoma	IIIb	90	Han	Widowed
P24	female	63	rural	junior high school	farmer	chest pain	Adenocarcinoma	IV	136	Yao	Married
P25	male	45	town	undergraduate	clerk	Cough	Small cell carcinoma	Extensive stage	100	Zhuang	Married
P26	female	33	rural	Primary school	farmer	Cough	Adenocarcinoma	IIIa	120	Han	Single
P27	male	60	rural	junior high school	farmer	fatigue	Squamous cell carcinoma	IV	100	Zhuang	Widowed

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Table 1 (continued)

Patients ID	Gender	Age(years)	Living area	Education level	Occupation	Primary symptom	Type of lung cancer	Stage of disease	Duration of patient delay (days)	Ethnicity	Marital status
P28	male	52	rural	junior high school	self-employed	Cough	Adenocarcinoma	IV	110	Han	Married
P29	male	64	rural	Primary school	farmer	Cough	Adenocarcinoma	IV	92	Zhuang	Widowed
P30	male	60	rural	junior high school	farmer	Cough	Adenocarcinoma	IIIb	105	Han	Married

a.If extensive stage is established, further staging evaluation is optional

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Table 2 Themes and subthemes

Themes	Subthemes
Reasons for patient delay	Ignore or dismiss symptoms
	Lack of family support
	Poor access to health services
	Covid-19 pandemic
Health seeking triggers	Family or friend persuasion
	Symptoms recur or worsen
	Invalid self-treatment
Perception of patient delay	Regret
	Increased caregiver burden
	Lack of knowledge about disease causes and symptoms
Potential solutions	Disease knowledge promotion
	Resource optimization and technology-based solutions

ting hoarse. At first, I didn't think much of it—I figured maybe it was because I wasn't drinking enough water and that it would clear up in a few days. My daughter even bought me tons of herbal tea to drink, but that didn't help at all. It wasn't until swallowing food became tough that I finally went to the hospital." (P9).

"In the beginning, I didn't pay enough attention to what my body was trying to tell me because honestly, I didn't know much about lung cancer and didn't have anyone around who could give me advice. Back then, I'd cough a lot and tried drinking water boiled with shredded radish. But later on, when they found a tumor in my lung during a check-up, that's when it hit me how serious this really was." (P13).

"At first, all I felt was some slight tightness in my chest and coughing—just thought it was another common cold—so I brushed it off. But as time passed by without any improvement—in fact things got worse—I started having trouble breathing and constant chest pain. With work keeping me busy, I'd keep putting off going for check-ups until those symptoms were seriously messing with my daily life." (P25).

Lack of family support
Some individuals lived alone or with young children, receiving no guidance when feeling unwell. Some women were too occupied with work and family responsibilities to visit a doctor. Others were unfamiliar with medical procedures and needed family support to navigate the hospital.

"When my son got diagnosed with liver cancer and ended up in the hospital, suddenly my little health issues seemed like nothing compared to what he was facing. Plus, since I've been divorced from his mom

for ages now, there wasn't anyone at home who could help take care of him." (P9).

"I lived with kids and elderly folks who couldn't really help out with all these complicated medical problems; managing everything on my own just wasn't possible." (P14).

"As an older woman living in the countryside with my kids far away, I was really scared to go to the hospital by myself. Even though I have three kids, they see me as a burden, so I didn't feel like I could tell them when I wasn't feeling well." (P15).

"After my wife passed away and my son got married and moved out, I hardly ever went to the hospital. Honestly, I didn't even know how to register on my own." (P29).

Poor access to health services
Most participants lived in remote rural areas with limited medical resources. When feeling unwell, they preferred nearby clinics or pharmacies for injections or prescriptions instead of traveling long distances to large hospitals for check-ups.

"I lived too far from a big hospital, so I'd just go to a nearby clinic. The doctor there misdiagnosed me with pneumonia and gave me some meds for relief." (P5).

"It would be great if doctors from city hospitals could come out to the countryside for consultations because getting medical care is getting tougher all the time." (P15).

"I didn't think it was that serious at first, so I just bought some pills at the local drugstore. There

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weren't any big hospitals close by, which left me with no other choice. If there had been one nearby, maybe I'd have gone." (P18).

"There were hardly any beds available in the hospital; I waited a long time without getting one, so I ended up putting off my visit." (P30).

Covid-19 pandemic
During the COVID-19 pandemic, epidemic prevention and control measures adapted to local conditions, creating confusion among participants. Measures like home isolation, pre-appointments, and requirements for recent negative nucleic acid test results (usually within 24–48 h) overwhelmed many and made it hard to register for medical care.

"I meant to go to the hospital but then found out that I'd need a negative nucleic acid test first. That made me hesitate and ultimately not go. The pandemic situation was pretty bad; it forced everyone into long lines for appointments. It just felt too much hassle." (P8).

"When I started coughing, COVID-19 was under strict control already. Plus, because of it, I'd lost my job and income. So honestly I barely went outside—I definitely didn't want to head over to a hospital for treatment." (P12).

"I was scrolling through stuff on my phone when I saw pictures of people sleeping on floors in hospitals—it freaked me out! What if there weren't any beds? And what if people were spreading germs everywhere? That made me put off going for a long time since hospitals didn't seem safe during this pandemic; catching the virus while trying to get help sounded awful! So yeah…I'd rather stay home."(P23).

Theme two: health-seeking triggers
Participants described their actions during the patient delay period, leading to the identification of three common health-seeking triggers: family or friend persuasion, symptoms recurring or worsening, and invalid self-treatment.

Family or friend persuasion
Some participants received encouragement from friends or family with medical knowledge and a positive attitude toward seeking help, which ultimately prompted them to visit a doctor.

"I thought I was still young and in good health, so I didn't think I needed any medicine or shots when I

got sick, let alone a trip to the hospital. But then my husband started watching some health videos that said if I had chest pain, it could be something serious with my lungs or heart, and that I should go to the hospital right away. So, he told me to take some time off work and get checked out." (P4).

"After my husband passed away, I was living alone and didn't want to bother my kids. I figured I'd just get better on my own. One day, my relative's daughter, who's studying medicine, came to visit. She noticed I was always clutching my chest and knew I had a lot of tightness and discomfort, so she urged me to go to the hospital. She even helped me book an appointment online. I really owe her one." (P19).

Symptoms recur or worsen
Symptoms recurred or worsened, impacting participants' daily lives and work. Unable to endure the discomfort, they sought medical attention.

"My symptoms kept coming back, and they got worse over time, which finally pushed me to go to the hospital for a check-up." (P6).

"When I first started coughing, I bought some cough syrup, and it seemed to help. But then I started having this dry cough that just wouldn't quit. It got so bad that I couldn't sleep at night, so I decided it was time to head to the hospital for a proper check-up." (P16).

"At first, I noticed I was getting tired really quickly after just a little walking, which was weird because I used to work in the fields all day without feeling worn out. I thought it was just me getting older and that I'd feel better after resting. But then I started coughing up blood and had a fever, so my son rushed me to the hospital for treatment." (P18).

Invalid self-treatment
Some participants lacked education and blindly followed advice from friends or neighbors. They resorted to local remedies for self-treatment, which failed to relieve their symptoms.

"I went to a nearby clinic and got some medicine, but it didn't help. My neighbor even suggested a local remedy, so I tried that too, but my symptoms just got worse, and I knew I had to see a doctor." (P12).

" I used to be a painter and barely had any downtime at work. When I started coughing, I thought it was no big deal, so I just threw on a mask. But then

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the cough got worse, so I decided to swing by the pharmacy and picked up some antibiotics based on what the clerk suggested, but they didn't really help. I even had some relatives bring me a few packets of Chinese herbal medicine, which I cooked up and drank for a bit. Not only did that not work, but I also started having chest pain. Eventually, I figured I should ask my boss for some time off to go to the hospital. " (P10).

Theme three: perception of patient delay

Participants shared their perceptions of patient delay and its impact on themselves and their families, as well as the challenges they faced in seeking medical consultation. Three sub-themes emerged: regret, increased caregiver burden, and lack of knowledge about disease causes and symptoms.

Regret

Although participants were unfamiliar with the term "patient delay," they comprehended its meaning, which prompted a palpable sense of regret. Many expressed sadness for not seeking medical assistance earlier.

> "When I finally got to the hospital, they told me it was terminal. I really regretted not seeing a doctor when I first noticed the symptoms. I was still young and hadn't even gotten married yet. I have so many regrets and things I wish I could change!" (P5).

> "I was careless and ignored the signs of my illness, and I didn't take care of myself like I should have. If I could go back, I would definitely see a doctor no matter how busy I was." (P7).

> "I hadn't heard of the term "patient delay" before, but I get it now—it means I waited too long to go to the hospital. I regret it now, but it's too late to change anything." (P27).

Increased caregiver burden

Worsening conditions due to delays in treatment hindered participants from fulfilling family and social responsibilities, with some unable to care for themselves. This led to an unwanted caregiver burden for their families.

> "If I had gotten treatment earlier, my situation wouldn't have gotten so bad. I heard cancer isn't something you can really cure, and it's such a huge burden for me and my family." (P2).

> "At my age, it's not even about getting better anymore; I just worry about putting a burden on my family. I can't take care of them, and instead, I'm just causing them more trouble." (P11).

> "It's not just me suffering; my son has to deal with it too. He's already busy with work and supporting his family, and now he has to find time and energy to take care of me. It really hurts to see him so worn out." (P19).

Lack of knowledge about disease causes and symptoms

Some participants were shocked when they received their lung cancer diagnosis because they believed only smokers could get lung cancer, and they had never smoked. They were unaware of the cause of their disease and could not connect their symptoms to lung cancer. So they were eager to learn more about the illness.

> "I never thought that a simple cold could lead to lung cancer. I'd really like to know more about the symptoms and how to prevent lung cancer. " (P1).

> "I'm a rural woman who works on our family farm. I've never smoked or touched alcohol. So, how on earth could I get lung cancer? No one ever mentioned that feeling a bit tired could be a sign of lung cancer. I always thought it was just a thing that happened to guys who smoked." (P4).

> "I really didn't get how I ended up with this disease. The diagnosis hit me hard. I've always been healthy and don't smoke. How could this be lung cancer?" (P30).

Theme four: potential solutions

The interview processes highlighted potential solutions, including disease knowledge promotion, resource optimization and technology-based solutions.

Disease knowledge promotion

Participants noted that increased awareness of lung cancer's causes and symptoms would encourage earlier medical intervention.

> "I don't really know what causes lung cancer, and I'd like more info on how to prevent it. It'd be awesome if farmers like me could easily find more about the symptoms of lung cancer." (P3).

> "I've been dealing with high blood pressure and diabetes for years, so I've come across a lot of stuff about them; but I hardly see anything about lung cancer. It'd be super helpful if there was more about recognizing symptoms and understanding prevention and treatment for lung cancer, so I wouldn't ignore what

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I was feeling." (P19).

Resource optimization and technology-based solutions

The shortage of medical resources prevented participants from accessing care, and the changing COVID-19 prevention and control measures worsened the situation. Optimizing resources and implementing technology-based solutions could improve conditions.

"I've always envied folks in big cities for their fancy medical services. I really hope the government decides to build a big hospital nearby one day, so we don't have to travel far just to see a doctor." (P11).

"This epidemic has really drained our medical resources. It would be amazing to have policies that make it easier for us to get hospital visits for cancer screenings during an epidemic, or even get diagnosed without actually going to the hospital." (P18).

"Wouldn't it be great if there were free lung cancer screenings and consultations? Then we wouldn't have to wait to get treated when we start feeling unwell. I bet everyone would jump at the chance to get screened if it didn't cost anything. This way, we can catch problems early and get treatment faster!" (P26).

Discussion

To the best of our knowledge, this is the first qualitative study to examine patient delay experiences among lung cancer patients in South China. The findings reveal that patient delay stems from a mix of subjective and objective factors, with the uneven distribution of healthcare resources and the Covid-19 pandemic also contributing to the issue and warranting attention.

Reasons for patient delay

All interviewed lung cancer patients reported experiencing delays in seeking medical treatment. This study elucidated several factors contributing to their hesitance, including a lack of awareness regarding the symptoms of lung cancer, which led many individuals to overlook or dismiss early warning signs. Non-specific respiratory symptoms such as cough, sputum production, fatigue, chest tightness, and chest pain were frequently disregarded during the initial stages of the disease. Islam et al. [21] also identified symptom neglect as a significant contributor to patient delay. Furthermore, Basharat et al. [22] found that majority of patients resorted to self-treatment due to inadequate knowledge about disease risk factors, symptoms, and available treatments—factors that further exacerbated delays in obtaining medical care. The Theory

of Planned Behavior (TPB) posits that attitude serves as an important predictor of behavior; specifically, a more positive attitude correlates with a reduced likelihood of delaying medical treatment [23]. This study attributes the delayed medical responses among patients diagnosed with lung cancer primarily to behavioral attitude disorders and asserts that these disorders represent a critical reason for postponing necessary healthcare treatment seeking.

Additionally, the absence of familial support significantly hindered timely access to medical assistance; many participants prioritized other responsibilities over their health needs. Employed individuals particularly reported difficulties in securing support for attending doctor appointments. The TPB underscores the significant role of perceived subjective norms on individuals' behavioral choices [24]. This study indicates that the medical treatment behaviors of lung cancer patients can be influenced by external pressures, including family, friends, and professional obligations. The absence of family support notably exacerbates delays in seeking medical treatment. Moreover, research by Islam [21] et al. emphasizes that work-related barriers and social responsibilities can impede patients' decisions to pursue assistance.

According to the TPB, perceived behavioral control, a critical factor affecting behavioral intentions, pertains to the influence of prior experiences and existing conditions on an individual's inclination to seek medical treatment [24]. Our findings suggest that inadequate access to healthcare services, resulting from structural barriers such as a shortage of qualified medical personnel or the predominance of large medical institutions, contributes to delayed patient care. This issue has been further intensified by the COVID-19 pandemic and its associated control measures. Consequently, it is imperative to identify strategies aimed at mitigating these challenges and enhancing access to healthcare services, especially during unpredictable events [25].

Potential solutions

The study highlights several strategies to reduce patient delays in lung cancer diagnosis, emphasizing the need for improved disease knowledge, resource optimization, and implementing technology-based solutions.

Despite the presence of early lung cancer symptoms, their atypical nature often leads to them being disregarded, which significantly contributes to delays in diagnosis. This underscores a knowledge gap that necessitates public education to address misconceptions and promote timely treatment [26].While smoking remains the predominant risk factor for lung cancer, educational initiatives should also cover other contributing factors. It is crucial to inform patients

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about the progression of lung cancer and the importance of recognizing non-specific symptoms to reduce delays in seeking care. Future health education should aim to enhance awareness and provide positive information about early cancer detection, alongside public awareness programs designed to prevent delays and encourage early diagnosis [27, 28].

The COVID-19 pandemic has led to extended social distancing measures and restrictions on medical procedures, likely resulting in decreased cancer screenings and disrupted diagnoses [29]. In the United States, individuals disproportionately affected by COVID-19 encounter significant challenges in accessing timely colorectal cancer screenings [30], with patient delays being a notable consequence [31]. Similarly, in China, routine hospital visits for cancer screenings have been adversely impacted by the epidemic. Interviews conducted revealed that insufficient medical resources and limited access to treatment have contributed to these delays. This situation underscores the urgent need for policies that prioritize timely screening and diagnosis of lung cancer during this crisis. Expanding access to diagnostic services, enhancing patient communication, and optimizing resource allocation in response to evolving epidemiological conditions can provide effective solutions [32]. Furthermore, expanding telehealth initiatives can reach more vulnerable populations [29]; healthcare professionals may also utilize social media platforms to address cancer disparities exacerbated by COVID-19 [31]. However, maximizing the potential of telemedicine necessitates bridging the digital divide and implementing policies that support reimbursement for telemedicine services [33].

Certain limitations should be acknowledged. All interviewees were recruited from a single hospital setting, which may introduce research bias into our findings. Future studies would benefit from including patients from multiple centers or diverse scenarios. Additionally, we did not gather information regarding participants' living arrangements; such details could influence their decision-making processes when considering seeking help.

Conclusion

Patient delay negatively impacts disease prognosis and survival rates among lung cancer patients who experience varying degrees of delay. Contributing factors include neglecting or dismissing symptoms, lack of family support, limited access to health services, as well as complications arising from the COVID-19 pandemic. Promoting disease knowledge, optimizing resources and implementing technology-based solutions could effectively mitigate the condition.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12885-024-13295-2.

Supplementary Material 1.

Supplementary Material 2.

Declarations

Ethics approval and consent to participate
This study was approved by the Ethics Committee of the First Hospital of Guangxi Medical University (Approval No.2021-12). Each participant was assigned a number to protect their anonymity, informed consent to participate was obtained from all the participants in the AQ study.

Consent for publication
Not Applicable.

Competing interests
The authors declare no competing interests.

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