

A qualitative research on the unmet needs of follow-up for chronic obstructive pulmonary disease patients during discharge transition period

Ruichu Zhang

First Affiliated Hospital of Guangzhou Medical University

Xiangfen Su

suxiangfengfy@163.com

First Affiliated Hospital of Guangzhou Medical University

Zhisheng Zhang

First Affiliated Hospital of Guangzhou Medical University

Xinyi Guan

First Affiliated Hospital of Guangzhou Medical University

Anliu Nie

First Affiliated Hospital of Guangzhou Medical University

Shaona Liao

First Affiliated Hospital of Guangzhou Medical University

Ziyu Feng

First Affiliated Hospital of Guangzhou Medical University

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4 **Title page**

5 Ruichu Zhang¹, Xiangfen Su¹, Zhisheng Zhang², Xinyi Guan², Anliu Nie², Shaona
6 Liao², Ziyou Feng²

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8 Ruichu Zhang: Department of Emergency, First Affiliated Hospital of Guangzhou
9 Medical University, Guangzhou Medical University, Guangzhou, China, 510120.

10 Xiangfen Su: Department of Emergency, First Affiliated Hospital of Guangzhou
11 Medical University, Guangzhou, China, 510120.

12 Zhisheng Zhang: Department of Emergency, First Affiliated Hospital of Guangzhou
13 Medical University, Guangzhou, China, 510120.

14 Xinyi Guan: Department of Emergency, First Affiliated Hospital of Guangzhou
15 Medical University, Guangzhou, China, 510120.

16 Anliu Nie: Department of Emergency, First Affiliated Hospital of Guangzhou Medical
17 University, Guangzhou, China, 510120

18 Shaona Liao: Department of Emergency, First Affiliated Hospital of Guangzhou
19 Medical University, Guangzhou, China, 510120

20 Ziyou Feng: Department of Emergency, First Affiliated Hospital of Guangzhou

1 Medical University, Guangzhou, China, 510120

2 **Corresponding author's:**

3 Corresponding author's name: Xiangfen Su

4 Email: suxiangfengfy@163.com

1 **Abstract**

2 **Objective:** Aimed at exploring COPD patients' follow-up service preferences and
3 unmet needs during the transitional period. Additionally the study with a view to
4 provide a reference for the follow-up service plans during the discharge transition
5 period.

6 **Methods:** This study was used a descriptive qualitative research approach. The study
7 was adopted purposive sampling. In this study, the research was selected COPD
8 patients discharged from the respiratory department of a tertiary hospital in
9 Guangzhou; The study focused on semi-structured in-depth interviews to collect data;
10 Finally, the Colaizzi's seven-step method was employed to organize and analyze the
11 interview data.

12 **Results:** The study was interviewed seventeen respondents and identified five core
13 needs themes. The themes were included preference for follow-up service delivery
14 formats, disease knowledge together with practical skill guidance, doctor-patient
15 communication along with professional consultation, psychological counseling and
16 emotional support, as well as seamless care transitions of record management.

17 **Conclusion:** Patients with COPD exit diverse follow-up needs during the transition
18 period after discharge, some requirements remain unmet. Future clinical work and
19 related research should be based on patients' actual needs for building a stronger
20 transitional follow-up health service system.

21 **Keywords:** Chronic obstructive pulmonary disease; The discharge transition period;
22 Preferences for follow-up services; Unmet needs; Qualitative research

1. Introduction

COPD (Chronic obstructive pulmonary disease, COPD) is characterized by irreversible airflow limitation, along with short-term readmission after discharge is a common feature among patients. Related studies ^[1] were shown that 27%-47% of COPD patients in China lacked continuous care and standardized guidance after discharge. The absence of discharge medical support easily triggers disease recurrence, causing patients to be readmitted within one month after discharge ^[1]. In 2011, follow-up care data from public hospitals in the United States and Hong Kong were indicated that approximately 22% ^[2] and 24% ^[3] of COPD patients require readmission within three months of discharge. Readmission not just affects the physical, mental health and quality of life of patients, but also imposes a heavy economic burden on their families ^[4].

The hospital discharge transition period is a critical phase in the overall management of COPD. The goal during this phase is to help patients smoothly transition to a home or community setting while providing continuous, individualized treatment and rehabilitation interventions. The discharge transition period begins on the date of discharge and lasts for a total of three months ^[5]. Identifying the follow-up needs of patients with COPD during this transitional period provides healthcare professionals with a reliable source of information. Follow-up staff tailor the future follow-up care plans based on patients' needs, helping improve patients' health outcomes ^[6]. If healthcare providers neglect the follow-up needs of patients with COPD during the transition period, the risk of adverse events will increase ^[6-9]. On

1 the one hand, neglected needs may lead to a continued decline in patients' subsequent
2 cooperation and adherence to treatment ^[6] ; On the other hand, neglected needs may
3 hinder communication between doctors and patients, making efficient information
4 delivery impossible ^[6] .

5 Currently, follow-up during the discharge transition period for COPD patients is
6 receiving increasing attention. Researchers have conducted quantitative surveys on
7 the follow-up needs during the discharge transition period of COPD patients ^[10-12] .
8 Considering that follow-up during the discharge transition period involves subjective
9 feelings from multiple perspectives, the content is difficult to fully presented through
10 quantitative data. Therefore, the study was employed a qualitative research approach
11 to conduct in-depth interviews with patients with COPD who were in the
12 post-discharge transition period. By analyzing the interview data, this study was
13 summarized patients' needs for follow-up services, with the aim of providing
14 empirical support for the development of personalized follow-up plans for the
15 transition period.

16 **2. Background**

17 The discharge transition period for COPD (Chronic Obstructive Pulmonary
18 Disease, COPD) is a vulnerable phase for the condition of patients, and also a critical
19 phase for optimizing long-term treatment plans. Identifying the follow-up needs of
20 patients with COPD during the discharge transitional period provide healthcare
21 professionals with a reliable source of information. Healthcare staff propose

1 personalized follow-up plans based on patients' actual needs, which improve
2 prognosis. If healthcare providers neglect the needs of patients with COPD during the
3 transition period, the risk of adverse events will increase.

4 **3. The Study Aims**

5 The study aimed at exploring COPD patients' follow-up service preferences and
6 unmet needs during the transitional period. Additionally the study with a view to
7 provide a reference for the follow-up service plans during the discharge transition
8 period.

9 **4. Methods**

10 **4.1. Study design**

11 This study is a descriptive qualitative study. The interviews were conducted in a
12 quiet classroom of the respiratory medicine department of a tertiary grade A hospital
13 in Guangzhou from May 21, 2026 to June 10, 2026. This study was adopted the
14 purposive sampling strategy to recruit participants. Researchers adopted conducted
15 semi-structured interviews. The research theory was based on phenomenology.
16 Researchers completed standardized training for unified qualitative interviews;
17 Additionally, all members of the research team have a professional foundation related
18 to follow-up during the transition period of COPD; To ensure the research records
19 were standardized and rigorous, the entire process was conducted in accordance with
20 the COREQ checklist for qualitative research reports ^[13].

1

2 **4.2. Theoretical Framework**

3 The study adopted Meleis's transition theory as its theoretical framework ^[14].
4 The theory focuses on the follow-up needs of patients with COPD during the
5 post-discharge transition period, analyzed the dynamic shift in patients' follow-up care
6 needs after leaving the hospital environment compared to the inpatient phase.

7 **4.3. Study Setting and Recruitment**

8 The research participants were patients with COPD who were discharged from a
9 tertiary grade A hospital's respiratory department in Guangzhou. During the
10 implementation of the semi-structured interviews, the researchers completed the oral
11 content of the patients, primary family caregivers were allowed to provide additional
12 information.

13 **4.4. Inclusion and/or Exclusion Criteria**

14 Inclusion criteria for patients:

15 (1) Diagnosed with chronic obstructive pulmonary disease by medical diagnosis;
16 (2) Age ≥ 18 years; (3) Patients with chronic obstructive pulmonary disease confirmed
17 to be discharged from the respiratory department; (4) Clear consciousness, clear
18 comprehension, and able to communicate and interact normally;

19

20 Exclusion criteria for patients:

1 (1) Patients with severe damage to organs: the heart, brain, and kidneys.

2 **4.5. Sample size determination**

3 The sample size for the interviews was determined based on the point where no
4 new themes or ideas emerged after analyzing the data. In total, seventeen cases were
5 included, numbered P1-17.

6 **4.6. Interview outline**

7 Relevant literature was consulted based on the research questions; A preliminary
8 interview outline was drafted after discussions with the research team members. After
9 conducting three pre-interviews, the final formal interview outline was formed:

10 (1) Within the three months after returning home after discharge, what aspects of
11 help do you hope we provide?

12 (2) Have you heard of discharge transition follow-up services? what type of
13 discharge transition follow-up care service do you prefer? In what form do you want
14 to follow-up?

15 (3) What is your primary concern prior to being discharged from the hospital?
16 Within the three months after returning home from the hospital, will there be any
17 situations where you feel anxious? For example, in terms of disease recovery,
18 medication, life care, self-care, etc. which aspects make you uncertain? Please
19 elaborate.

20 (4) Have you ever applied for assistance from community health services? Could

1 you briefly share your impressions of those services? Which aspects of community
2 health services do you care about? What are your expectations for the transition
3 services from a tertiary hospital to a community hospital? Which aspect of these
4 transition services is most important to you?

5 (5) Within the three months after returning home after discharge, What are your
6 needs and expectations regarding psychological and social support?

7 (6) Within the three months after returning home after discharge, in terms of
8 rehabilitation services, What aspects of help are you looking for?

9 (7) Within the three months after returning home after discharge, how often do
10 you hope we follow-up with you? How often would you like us to follow-up with you,
11 who would you like to conduct the follow-up, and what form of follow-up feedback
12 would you like to receive after each visit?

13 **4.7. Data Collection**

14 This study was employed a qualitative research method. The research
15 participants were selected strictly according to the inclusion and exclusion criteria.
16 Before the interview, the research team explained the purpose, content, and process of
17 the interview to the interviewees, clearly outlined the guidelines for data use,
18 promised to keep their personal information strictly confidential. All participants' real
19 names were replaced with anonymous codes P1-P17. All participants were fully
20 informed about the study and their related rights, voluntarily participated in this study
21 and signed the informed consent form. The interview location was chosen in a quiet

1 classroom to conduct face-to-face interviews with patients. After obtaining the
2 interviewees' informed consent in advance, the researchers recorded the entire
3 interview audio and retained the recordings. Meanwhile, the researchers explained the
4 data usage protocol to the interviewees. All interview materials will be used solely for
5 this academic study and not be disclosed or used for other purposes.

6 During the interview, the researcher adhered to the principles of objectivity and
7 neutrality, flexibly adjusted the order and expression of questions based on the
8 interviewee's pace and state of response. Appropriate follow-up questions were asked
9 regarding core information relevant to the research, it is imperative to respect the
10 interviewee's expression without subjective guidance or suggestion. For vague or
11 ambiguous viewpoints, it is possible to clarify timely, ensuring the authenticity and
12 accuracy of the interview information. Simultaneously, the researcher made audio
13 recordings and notes during the interview process. The researchers documented
14 non-verbal information such as the interviewee's expressions and body language.
15 Each interview lasted between 20 and 60 minutes.

16 **4.8. Data Analysis**

17 Within 24 hours after the interview, the researcher completed the word-for-word
18 and sentence-by-sentence transcription of all audio recordings. The researchers used
19 Maxqda 2022 software to standardize the organization of the original interview text
20 messages. The researchers strictly followed the seven-step methods of Colaizzi's
21 seven-step to organize, summarize and conduct in-depth analysis of the interview data

[15].

4.9. Ethical Approval

This study was approved by the Medical Ethics Committee of the First Affiliated Hospital of Guangzhou Medical University (Ethical Approval Number: ES-2026-K162-01). All procedures strictly followed the relevant ethical guidelines of the Helsinki Declaration. During the recruitment stage of the study, the first author fully was explained the research purpose, implementation content and significance of the study to potential research participants. All interviews were conducted in a confidential manner, and the duration of the interviews was set to avoid increasing the physical and mental burden. The study was adopted the principle of voluntary participation, and the subjects could withdraw from the study at any time without adverse consequences; Before the formal interview, all participants signed a written informed consent form.

4.10. Rigor and reflexivity

(1) Before the interview began, the researchers selected a quiet demonstration classroom as the interview location. The researchers communicated in advance with three elderly COPD patients who would be discharged to reduce environmental disturbances and ensure the quality of data collection;

(2) Representative research participants were selected, and samples with different characteristics were evenly distributed;

1 (3) An appropriate interview atmosphere was created to ensure that the
2 respondents could freely, truly express their feelings and needs;

3 (4) The entire process was conducted by the researchers themselves, the data was
4 organized and analyzed objectively. Throughout the research process, personal
5 opinions and biases were not involved.

6 **4.11. Artificial Intelligence**

7 The study did not use any AI-generated tools.

8 **5. Results**

9 **5.1. Characteristics of Participants**

10 In this study, we conducted semi-structured interviews with 17 patients who had
11 been discharged from the hospital with chronic obstructive pulmonary disease. Table
12 one presents detailed information about the study subjects.

13

14

1 Table 1

2 *General characteristics of patients with chronic obstructive pulmonary disease in the*
 3 *qualitative interviews (N = 17)*

Number	Gender	Age	Education	Marital Status	Medical Expense Payment Method	Diagnosis	Have Chronic Diseases Beforehand	Other Diseases	Previous Acute Episodes
P1	Male	83	Primary School	Married	Resident Medical Insurance New Rural Cooperative Medical Insurance	AECOPD, Pulmonary Emphysema	Yes (Hypertension, Type II Diabetes)		2
P2	Male	69	High School	Married	Employee Medical Insurance	AECOPD, Pneumothorax	No		1
P3	Female	75	Junior High School	Married	Employee Medical Insurance	AECOPD	Yes (Hypertension)		1
P4	Male	75	Primary School	Married	Resident Medical Insurance	AECOPD, Pulmonary Aneurysm	Yes (Hypertension)		0
P5	Male	70	Primary School	Married	Resident Medical Insurance	Pulmonary Aneurysm, Pulmonary Emphysema	No		1
P6	Male	83	Primary School	Married	Resident Medical Insurance	AECOPD	Yes (Hypertension)		2
P7	Male	66	High School	Married	Resident Medical Insurance	AECOPD	Yes (Hypertension)		0
P8	Male	62	High School	Married	Resident Medical Insurance	AECOPD, Pulmonary Emphysema, Pulmonary Aneurysm	No		0
P9	Male	81	High School	Married	Employee Medical Insurance	AECOPD	Yes (Hypertension)		3

P10	Male	83	Primary School	Married	Resident Medical Insurance	AECOPD, Pulmonary Infection	Yes (Hypertension)	3
P11	Female	66	Primary School	Married	Employee Medical Insurance	AECOPD	No	2
P12	Male	70	High School	Married	Employee Medical Insurance	AECOPD	No	3
P13	Male	83	Junior High School	Married	Resident Medical Insurance	AECOPD	Yes (Hypertension)	4
P14	Male	73	Junior High School	Married	Resident Medical Insurance	AECOPD	No	3
P15	Male	61	Junior High School	Married	Resident Medical Insurance	AECOPD, Pulmonary Aneurysm	Yes (Hypertension)	3
P16	Male	75	Junior High School	Married	Employee Medical Insurance	AECOPD	No	3
P17	Male	79	Senior High School	Married	Resident Medical Insurance	AECOPD	Yes (Coronary Heart Disease)	4

1

2

5.2. Findings

Through data analysis, the study was summarized five core themes reflecting the follow-up care needs of COPD patients during the transitional period after discharge. The first theme is follow-up service preferences, which includes two sub-themes; The remaining four themes are: guidance on knowledge and skills, communication and counseling, psychological support, and the exchange of health information between general hospitals and community hospitals.

5.2.1. Theme 1: preference for follow-up services

After researchers fully explained the details of discharge transition period follow-up services to the participants. The participants developed two distinct preferences.

5.2.1.1. Sub-theme 1: dedicated or specialized medical teams follow-up

Six participants expressed their desire for follow-up services provided by a dedicated medical team or a specialized medical team.

L7: "Medical staff are already busy with their daily work, and we are also concerned that frequent consultations might disturb them. Actually, we really hope to have a dedicated position or team responsible for the follow-up of discharged patients.

L11: "If there are any changes in the condition or difficulties in home care after discharge, we would like to have a dedicated contact person available for immediate

1 consultation."

2 L12: "The hospital calls to follow-up on my condition every month. I hope the
3 medical staff responsible for the follow-up remain dedicated."

4 L13: "I learned that some hospitals have established professional rehabilitation
5 follow-up teams, set up patient groups, and conduct lung rehabilitation guidance
6 offline every week. They also share rehabilitation videos online for everyone to check
7 and learn, which is practical and make the rehabilitation training of patients more
8 directed. I also hope there will be a dedicated follow-up team to provide services for
9 us."

10 L14: "The medical staff in outpatient and inpatient departments are busy with
11 their daily work and have difficulty finding time for long-term follow-up.
12 Appointment and consultation often involve simple prescribing, lacking detailed
13 instructions on home care, medication details, and daily protection. I suggest
14 establishing a dedicated follow-up team."

15 L17: "If there is a dedicated team to follow-up and adjust the treatment plan as
16 needed, or if family beds or home care are provided, we and the patients will feel
17 much more at ease."

18 **5.2.1.2. Sub-theme 2:personalized follow-up care**

19 Three interviewees were expressed their hope that the follow-up service plans for
20 the period after discharge could be tailored to their needs.

21

1 L4: "Through follow-up communication, we are allowed for consulting and
2 solving the problems, which is equivalent to having an additional convenient
3 consultation channel."

4 L6: "Previously, we would also take medicine at both the traditional Chinese
5 medicine hospital and the Western medicine hospital. The combination of the two
6 methods for body regulation was more effective. Using one treatment method alone
7 was not ideal."

8 L12: "The treatment effect of aerosol combined with oral medication is the best.
9 Our home is equipped with an oxygen generator and a ventilator. When the condition
10 is stable, the ventilator is rarely used."

11 **5.2.2. Theme 2: knowledge and skill guidance needs**

12 In this study, 8 participants indicated that they hoped to receive professional
13 health knowledge and self-care skill guidance during the discharge transition period.

14 The specific contents included medication administration, home oxygen therapy,
15 dietary management, ventilator management, smoking cessation and alcohol
16 limitation, the establishment of healthy lifestyles, home rehabilitation training,
17 exercises on pulmonary function, as well as recognition of symptoms indicating
18 disease progression and emergency handling.

19

20 L1: "I remember all the regular medications clearly. If there is a need to adjust
21 the expectorant drugs or other medications later, I hope the medical staff explain to

1 me the reasons for the change and the precautions in detail."

2 L2: "I have lived in the countryside and do farm work regularly. My daily
3 physical activity is sufficient. There is no need for additional guidance on exercise.
4 The key points are still related dietary and lifestyle suggestions."

5 L3: "However, we hope that after discharge, there will be a dedicated person to
6 continuously follow-up and guide medication and oxygen therapy. As I get older, my
7 memory is poor, and it's easy to forget the medication instructions. I have also used
8 health management apps before, but I couldn't understand the content. Online
9 consultations have long queues and communication is inconvenient. If there could be
10 fixed medical staff providing answers via We-Chat and making medication reminders
11 at any time, it would be much more convenient."

12 L4: "The doctor mentioned it briefly, but I still don't fully understand the specific
13 rehabilitation training methods. "

14 L6: "My sleep is sometimes good and sometimes bad. It's not attributed to chest
15 tightness or shortness of breath that I wake up. Mainly, when wearing the ventilator at
16 night, the respiratory tract and mouth tend to become dry, and I often wake up as a
17 result."

18 L7: "When I smoke less or don't smoke at all, the cough symptoms will
19 significantly improve, but I still have not the ability to be quit and find a suitable
20 alternative method."

21 L14: "When encountering discomfort at home, I don't know if I am allowed for
22 taking additional medications, if different drugs have conflicts, and the specific times

1 and contraindications for taking and using should be explained. I have not the ability
2 to adjust them."

3 L15: "I hope that before I am discharged, the medical staff explain the usage
4 methods, replacement cycles, and usage frequencies of the medications."

5 **5.2.3. Theme 3: communication and consultation service needs**

6 In this study, 11 participants indicated that they hoped to receive professional
7 consultation and communication support from professional follow-up staff during the
8 discharge transition period.

9 The specific contents included: involved outpatient follow-up consultations,
10 personalized customization of follow-up tools, suitable frequency and format of
11 follow-up, inpatient beds coordinated by follow-up staff, feedback on the follow-up
12 situation.

13

14 L1: "I find it difficult to understand Mandarin. Communicating via We-Chat
15 would be better. I possess the capacity to read the text and listen to the voice. I am
16 also capable of typing or sending voice messages to reply to you."

17 L2: "Making phone calls is the most convenient. I'm older and not very
18 proficient in using We-Chat. Phone communication is straightforward and more
19 friendly. I hope that during each communication, you help me assess the current
20 recovery status and inform me of the precautions for rehabilitation."

21 L3: "We have also come into contact with health management apps before, but

1 the content was incomprehensible. Online consultations involve long queues and
2 inconvenient communication. If there could be fixed medical staff who answer
3 questions via We-Chat and provide medication reminders at any time, it would be
4 much more convenient."

5 L4: "Contacting by phone is fine. It's convenient to call me directly or my family.
6 Once every half a month to one month is sufficient."

7 L8: "This mainly depends on personal habits. I don't like to frequently receive
8 follow-up calls. I usually don't answer unfamiliar calls, fearing they might be spam
9 calls. Compared to phone communication, I'm more accepting of the consultation
10 method via We-Chat."

11 L9: "I prefer to use We-Chat for follow-up consultations. I suggest contacting
12 once a month. Just ask about my current condition and any changes in my illness."

13 L12: "I suggest strengthening the two-way communication between doctors and
14 patients, and promptly feedback problems and answering questions."

15 L13: "The hospital beds are in short supply. During acute episodes, it often takes
16 several days to be admitted. This has troubled me frequently. If we could get in touch
17 with you in advance by using, consulting about the number of beds, it would be
18 convenient."

19 L14: "I hope to set up a doctor-patient communication group. If I encounter
20 problems at home, I am in a position to consult you at any time, solving the problem
21 of 'no one to ask' after discharge."

22 L15: "My expectation is that when there is a sudden acute attack at home and I

1 need to come to the hospital, I am allowed for consulting you promptly and ask if
2 priority be given for a bed allocation, making us feel more at ease. "

3 L16: "The hospital will conduct follow-up calls, but I often mistake them for
4 spam calls and don't trust them. The follow-up staff will ask about the situation briefly,
5 but won't explain specific home care, disease response methods. I hope to carry out
6 regular and standardized follow-ups, and set up an online consultation platform to
7 facilitate immediate consultation."

8

9 **5.2.4. Theme 4: psychological health support needs**

10 In this study, 9 participants indicated that they hoped to receive psychological
11 care and negative emotion regulation during the discharge transition period.

12 The specific needs were included: helped patients adapt to the role transition
13 after discharge, alleviated illness-related stigma, effectively regulated the anxiety
14 emotion that arises during relapses of the condition.

15

16 L5: "I'm afraid that there will be another problem with my lungs, and I'm also
17 worried that my shortness of breath will worsen and I'll have breathing difficulties."

18 L6: "I won't be overly panicked, but my mood tends to be irritable and tense, and
19 I feel very uncomfortable. I don't have other underlying diseases like high blood
20 pressure or high cholesterol. The main problem is my repeated shortness of breath."

21 L7: "When my physical condition is good, I don't think much about it. But when

1 the illness flares up and I feel uncomfortable, I will regret it." "Being ill also adds
2 burden to my family. I have been concerned about this, but I haven't figured out the
3 specific prevention methods yet."

4 L9: "I often feel chest tightness and shortness of breath, and I keep coughing. I'm
5 also restless and anxious. I'm also worried that my physical condition will burden my
6 family."

7 L10: "I used to like swimming, doing pull-ups and push-ups, and going out to tea
8 houses for tea. Now, due to the impact of the illness, I have not the ability to continue
9 these hobbies. I still feel regretful and hope to live like a normal person."

10 L11: "Without wearing the device, I feel uncomfortable breathing. I possess the
11 capacity to continue using it, but when wearing it, I feel chest tightness. Going out
12 also makes me be looked at strangely by others. I feel uncomfortable, but I don't have
13 any other options."

14 L12: "Even a little movement makes me tired and short of breath. Long-term
15 suffering from illness has affected my emotions."

16 L15: "Yes. Even if it's just mild shortness of breath, I will be panicked and
17 anxious. Before discharge, I was worried about the illness flaring up again."

18 L16: "I will have concerns. After the last attack, I had body aches and it took two
19 days of applying plasters to get better. I often fear that I will have another sudden
20 attack of shortness of breath."

1 **5.2.5. Theme 5: Establishment and Management of Connection needs**

2 Three interviewees proposed the needs to establish a tripartite collaborative
3 service model involving hospitals, communities, and families.

4

5 L2: "Even if the medical records are transferred, the community hospital doesn't
6 recognize the imaging results from our side. When it reaches the community, we have
7 to take new X-rays for re-examination. This causes unnecessary repetitive
8 communication."

9 L3: "The community hospital have not the ability to connect with the diagnosis
10 information of the tertiary hospital, and it doesn't know the detailed information about
11 the patient's previous hospitalizations and acute episodes. It would be best to integrate
12 the information systems of the two hospitals and synchronize the inpatient medical
13 records and treatment plans from the tertiary hospital to the community, so that the
14 community carry out subsequent health management more conveniently. I also hope
15 that the tertiary hospital send specialized staff to the community, so that patients
16 consult and get medications nearby without having to repeatedly travel to the major
17 hospital. Currently, the information between the two sides is not connected, and the
18 community doesn't know the patient's condition, and the treatment plans prescribed
19 are also not coordinated."

20 L5: "The community also have not the ability to access my medical examination
21 reports and treatment records in our hospital, and the treatment connection is not
22 smooth."

1 **6. Discussion**

2 **6.1. Matching the follow-up service model based on patient** 3 **preferences**

4 **6.1.1 Professional guidance from stable expert team**

5 The study find that systematic and standardized follow-up services cannot be
6 separated from the professional guidance and companionship of professional teams.
7 Multiple studies have supported the above viewpoint^[16-17]. Compared to traditional
8 follow-up models, establishing a patient-centered multidisciplinary follow-up team
9 have positive effects: improving patients' clinical symptoms, enhancing patients'
10 quality of life, and reducing their medical expenses.

11 Frequent changes in the follow-up staff are detrimental to patients' sense of
12 psychological security. New follow-up staff members are unfamiliar with patients'
13 conditions, leading to homogenization of health education content, reducing patient
14 follow-up compliance. Patients are required to repeatedly narrate their medical history,
15 hospitalization details, and medication responses, which significantly raise the
16 communication expenses for both parties.

17 Therefore, it is advisable to build a specialized follow-up service system that is
18 centered on specialized nurses, coordinated by multiple disciplines, with
19 complementary advantages. During the transition period after discharge from COPD,
20 follow-up staff are expected to establish a trusting relationship with the patient. The
21 conclusion had also been confirmed by Geng Changfang et al.^[18] and Ingrid Charlotte

1 Andersen et al. ^[19].

2 **6.1.2 Personalized follow-up guidance**

3 The study find that follow-up services during the transition period would do well
4 do consider their own needs. Respondents expect to receive health supervision
5 through home-based management models and promptly correct their own
6 non-standard care practices. Given the fact that study subjects were predominantly
7 middle-aged and elderly patients with COPD, a group with limited knowledge of
8 post-discharge transitional care ^[20].

9 Additionally, when patients' conditions improve, discharge from the hospital,
10 their role shifts from passively receiving care to independently managing their health.
11 Most patients have not received systematic guidance before discharge and lack
12 sufficient self-management capabilities. Moreover, COPD patients keep limited
13 activity tolerance during the discharge transition period, with slow recovery of
14 physical function. If professional guidance and supervision are interrupted, the risk of
15 readmission increases, the conclusion was consistent with the findings of Qian Yisi et
16 al. ^[21].

17 Based on these practical experiences, follow-up staff are advised to develop
18 phased management plans in accordance with patients' home rehabilitation status,
19 along with strengthen health supervision. In addition, follow-up staff are supposed to
20 use diverse educational tools to provide health guidance, such as videos and
21 knowledge graphs. On this basis, follow-up staff are expected to regularly educate

1 patients about disease prognosis, home care, and rehabilitation training.

2 Some participants indicate that a combination of traditional Chinese and Western
3 medicine is appropriate to their therapy during the home treatment phase. The study
4 aligned with the findings of Li Ying et al. ^[22]. Li Ying et al. ^[22] conducted a study on
5 patients with COPD overlap syndrome using integrated western and traditional
6 Chinese medicine approaches combined with inhalation therapy. Researchers
7 confirmed that individualized comprehensive medication management effectively
8 reduced airway inflammation and improve lung function.

9 It can be wise for follow-up staff to identify the patient's disease type in advance,
10 consider the severity of symptoms and lung function. If the patient has comorbidities,
11 follow-up staff are expected to explain the usage, dosage, and frequency of various
12 medications in detail, with a focus on demonstrating the standard operation of
13 inhalation devices. During follow-up care, close-observation of patients' respiratory
14 symptom changes and adverse drug reactions was necessary. It is rational for patients
15 to regularly check lung function and related laboratory indicators, with a view to
16 evaluate the efficacy of combined therapy. If improvement is insufficient, patients'
17 feedback require to be promptly collected, the intervention plans are recommend to be
18 adjusted.

19 **6.2. Strengthening the education on disease knowledge and** 20 **self-management skills for patients**

21 Some participants expressed their desire to receive systematic guidance on

1 specialized knowledge and practical skills related to COPD during the discharge
2 transition period. The result was consistent with previous research findings ^[23-24].

3 A clear and complete understanding of the disease help patients appreciate the
4 importance of standardized self-management after discharge. Patients consciously
5 adhere to healthy behaviors, meeting the strict requirements of home-based disease
6 care education. After leaving the hospital care environment, patients no longer have
7 access to real-time monitoring and immediate professional guidance from medical
8 staff. Patients are required to independently carry out various types of home care tasks
9 such as medication management and home oxygen therapy.

10 To this end, the follow-up staff are expected to regard knowledge education and
11 practical skill training as integrated intervention contents. On one hand, it is advisable
12 to systematically carry out specialized health education on COPD. There is a
13 necessity to provide targeted explanations on disease pathogenesis, pharmacological
14 effects, home rehabilitation intervention plans, and early warning signs of acute
15 exacerbation. On the other hand, during the discharge preparation period, it is
16 appropriate to check each patient's practical skills. Skills included inhaler device use,
17 home oxygen therapy, and respiratory rehabilitation training, promptly correcting
18 various non-standard operational behaviors. For patients who are not compliant,
19 follow-up staff are expected to consider patients' living environment and physical
20 tolerance to identify the causes, distinguish whether the root cause of the problem is a
21 lack of understanding or a deficiency in operational skills.

6.3. Pay attention to the communication and professional health consultation needs of patients

Some participants expressed that they hoped to maintain regular contact with the follow-up staff during the discharge transition period and obtain convenient and efficient medical consultation services.

Patients commonly possess several questions. Such as the following: disease mechanisms, medication protocols, recognition of disease progression, inhalation devices instructions, oxygen therapy equipment manuals, and standardized rehabilitation exercise guidelines; This result was consistent with the conclusion of Wang Qiujuan et al. ^[25].

Our study subsequently found that patients preferred to use We-Chat as the communication medium during the discharge transition period. With the popularization of mobile Internet and smart phones, instant communication platforms such as We-Chat and tencent meeting software had advantages in continuous care. This was consistent with the conclusion of Liu Hefen ^[26]. Compared with traditional telephone follow-up, the We-Chat platform or tencent meeting were intuitive and detailed. To name a few: text, voice, short videos, and the health education. Compared with email and social software channels, it had higher acceptance by the public and more comprehensive functional coverage.

In addition, some participants proposed that if there is an acute exacerbation of COPD during isolation, they hoped to quickly connect with the follow-up medical team and prioritized coordinating hospital beds for being admitted to hospital. The

1 finding is consistent with the conclusion of Anne-Grethe Halding et al. ^[27] . A
2 well-established consultation system help patients promptly manage acute episodes.
3 Patients are capable of calmly responding to the changes in their condition. A
4 closed-loop, two-way communication, feedback, and guidance system between
5 doctors and patients have been established.

6 Therefore, follow-up work are expected to optimize the service model from
7 multiple dimensions. It is advisable for follow-up staff to consider patients' usage
8 habits and integrate channels, with the aim of building a long-term patient-caregiver
9 interaction mechanism. In the second place, staff are supposed to establish a
10 closed-loop follow-up process of "problem feedback - professional response - plan
11 optimization." The model enriches the scope of follow-up services and brakes through
12 the single limitation of asking the patients about their condition. What's more, the
13 follow-up team ought to refer to established domestic and international patient–
14 clinician communication protocols to clearly inform patients of the emergency contact
15 procedures.

16 **6.4. Pay attention to the psychological health needs of patients**

17 Some participants contended that it would be beneficial to provide psychological
18 support during the discharge transition period. After discharge, living environment
19 has changed, furthermore, patients' role have shifted, parallel to the economic burden
20 from long-term treatment of diseases, have been increased the difficulty of disease
21 management for patients. The patients' physical functions had not fully be recovered

1 during the discharge transition period, affected by disease persistence and
2 deterioration, their social activities and interest participation were restricted. This
3 phenomenon was consistent with the research results of Song Yanru et al.^[28].

4 Likewise, the study showed that patients who have previously received
5 mechanical ventilation treatment experienced physical discomfort and psychological
6 distress. Long-term use of oxygen therapy devices and ventilators alter patients'
7 appearance, triggered psychological distress. Patients might feel a decline in
8 self-worth, then avoided social interactions, consequently experience increased social
9 isolation. A study abroad^[29] also was supported this conclusion.

10 Moreover, patients often experience psychological distress due to worrying about
11 disease recurrence, financial pressure and caregiver burden on their families. Relevant
12 studies^[30-31] and the results of this study were consistent. The main family caregivers
13 of COPD patients were usually middle-aged or elderly spouses, who were prone to
14 possess limited energy and physical strength. Relying solely on family resources
15 makes it difficult to sustain long-term, continuous care for chronic diseases. If the
16 caregivers had poor health conditions, the psychological burden of the patients would
17 further intensify.

18 In addition, persistent physical discomfort would gradually erode the
19 psychological state, induced negative emotions, just as anxiety and depression. The
20 result was consistent with the conclusion of Li Yanfang et al.^[32].

21 Therefore, a multidisciplinary follow-up team are supposed to place a higher
22 premium on conducting discussions on developing a stratified psychological

1 intervention plan based on the assessment results. Moreover, patients were guided to
2 view their illnesses and physical changes rationally during the follow-up period. In a
3 bid to brace for avoiding self-isolation, patients are encouraged to participate in social
4 activities moderately. Simultaneously, by guiding patients and their families in
5 establishing healthy communication methods, people can reap the benefits of
6 alleviating psychological pressure. As a final point, addressing persistent physical
7 discomforts such as chest tightness and shortness of breath, follow-up personnel are
8 expected to develop individualized symptom management plans.

9 **6.5. Improve the information exchange mechanism for patients**

10 Some interviewees calls for improving the establishment of unified records and
11 information linkage services under a three-way hospital–community–family
12 collaboration during during the discharge transition period. Stem from patients are
13 discharged, key health records cannot be seamlessly transferred among tertiary
14 hospitals, community health service centers, and patients' homes. Information barriers
15 between these different institutions induce gaps in the transmission of patient records.
16 Community medical staff found it difficult to fully grasp the entire process of the
17 patient's in-hospital treatment. Accordingly, it is desirable if patient and their family
18 members collected fragmented information for supporting follow-up assessment
19 work.

20 Standardizing electronic health records and establishing channels for tripartite
21 data interoperability were fundamental conditions for ensuring continuous care for

1 COPD patients during the discharge transition period. The approach empowers
2 follow-up staff with complete, coherent diagnostic and treatment reference materials,
3 addressing the shortcomings of fragmented and incomplete follow-up information
4 from single medical institutions; Equally important, the approach facilitated dynamic
5 monitoring of disease activity, early predicted the risk of acute exacerbation in
6 advance, and improved the effectiveness of health management services during the
7 discharge transition period. The view was consistent with the research conclusion of
8 Li Enci et al. [33] .

9 The crux of the measure is that an integrated medical and health record database
10 based on the regional medical information platform are required to solve. The
11 database information is expected to interoperate and share between tertiary hospitals
12 and primary healthcare institutions, comprehensively being consolidated all core
13 diagnostic and treatment data from the patient's inpatient period. And things that other
14 people take the platform content optimization for granted, for instance, discharge
15 rehabilitation plans, home care protocols, follow-up schedules, as well as disease risk
16 assessment indicators. Hinge on this region-wide integrated data, creating a
17 dynamically updated specialty electronic health record can be a lifeline for COPD
18 patients' information exchange inside and outside the hospital.

19 **7. Limitations**

20 The study was only explored the unmet follow-up needs during the discharge
21 transition period from the perspective of patients with COPD. Future researches could

1 include multiple stakeholders: follow-up healthcare providers, family caregivers, and
2 medical administrators to explore the gaps in follow-up needs.

3 The study was only captured the characteristics of patients' follow-up needs at a
4 single time point, making it difficult to reveal the dynamic evolution of follow-up
5 needs during the discharge transition period as the disease progresses. Future research
6 could be adopted longitudinal qualitative interviews to continuously track and
7 dynamically explore patients' follow-up needs at different stages.

8 The study was primarily included elderly patients with chronic obstructive
9 pulmonary disease; Middle-aged and young COPD samples were underrepresented,
10 making it difficult to comprehensively characterize the follow-up needs of
11 middle-aged and young COPD patients during the post-discharge transition period.
12 Future research could be broaden the sample to include middle-aged and young
13 COPD populations, systematically explore their follow-up needs during the discharge
14 transition.

15 The study did not be performed stratified analyses based on COPD severity,
16 making it difficult to clarify differences in follow-up needs among patients with
17 varying disease stages. Future research could be differentiated by disease severity to
18 further explore the heterogeneity of follow-up needs during the post-discharge
19 transition period for COPD patients.

8. Conclusion

The study was systematically explored the preferences of patients with COPD for follow-up care services and their unmet needs during the discharge transition period. Five themes were included preference for follow-up service delivery formats, disease knowledge together with practical skill guidance, doctor-patient communication along with professional consultation, psychological counseling and emotional support, as well as seamless care transitions of record management.

In subsequent research and clinical practice, follow-up care teams are expected to fully consider the service preferences of COPD patients across different age groups, dynamically monitor patients' home-management status, and develop individualized follow-up plans for the transition period. Health administration authorities are also supposed to pay attention to post-discharge continuity of care, introduce and refine supporting service policies, close the service gap between inpatient treatment and home-based rehabilitation, jointly build a standardized, sustainable transition-period follow-up care system.

The qualitative research had adhered to relevant EQUATOR guidelines and named the qualitative research reporting method.

9. Declarations

9.1 Ethics approval and consent to participate

This study was approved by the Medical Ethics Committee of the First Affiliated

1 Hospital of Guangzhou Medical University (Ethical Approval Number:
2 ES-2026-K162-01). All procedures strictly followed the relevant ethical guidelines of
3 the Helsinki Declaration. During the recruitment stage of the study, the first author
4 fully was explained the research purpose, implementation content and significance of
5 the study to potential research participants. All interviews were conducted in a
6 confidential manner, and the duration of the interviews was set to avoid increasing the
7 physical and mental burden. The study was adopted the principle of voluntary
8 participation, and the subjects could withdraw from the study at any time without
9 adverse consequences; Before the formal interview, all participants signed a written
10 informed consent form.

11 **9.2 Consent for publication**

12 Not applicable.

13 **9.3 Availability of data and materials**

14 All data generated or analysed during this study are included in this published
15 article.

16 **9.4 Competing interests**

17 There are none for each author.
18

19 **9.5 Funding**

20 The funding source had no involvement.
21

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