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Patient Journey Mapping in Patients Undergoing PCI for Acute Myocardial Infarction: A Qualitative Study

Na lv
The First People's Hospital of Lianyungang
Yan YANG
187955550390163.com

The First People's Hospital of Lianyungang
Xiaoyan Hu
The First People's Hospital of Lianyungang
Jian Wu
The First People's Hospital of Lianyungang
Jie Zhang
The First People's Hospital of Lianyungang

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Abstract

Objective This study explores the behaviors, emotions and pain points of patients undergoing PCI treatment for acute myocardial infarction throughout the entire process, in order to provide a basis for constructing an integrated nursing model that extends from acute treatment to full-cycle health management.

Methods A descriptive qualitative design was used. Thirty-three patients with AMI treated with PCI were recruited from the cardiology department of a tertiary hospital in China by purposive sampling between October and December 2025. Data were collected through semi-structured interviews, participatory observation, and medical record review at two time points (during hospitalization and 3 months after discharge), and were analyzed following Colaizzi's seven-step method. Journey maps were constructed for each phase of care.

Results Along the timeline of the emergency warning phase, the catheterization laboratory phase, the in-hospital recovery phase, and the long-term rehabilitation phase, core themes were identified from three dimensions: behaviors, emotions, and pain points. These included neglect of early symptoms and rapid care-seeking, engagement in intraoperative communication, building a care support system, and self-managed rehabilitation, together with phase-specific emotional responses such as fear and illness uncertainty, loneliness during the procedure, postoperative role confusion, and post-traumatic stress responses. A visual patient journey map was developed on this basis.

Conclusion The journey of patients undergoing PCI for AMI is a dynamic recovery process involving physiological restoration, psychological adjustment, and social reintegration. In the future, through full-cycle psychological interventions and digital intelligent platforms, we can achieve comprehensive, precise, and personalized care, reduce patients' anxiety levels, and improve their treatment experience and long-term rehabilitation outcomes.

Introduction

Acute myocardial infarction (AMI), with its abrupt onset, distressing symptoms, and high case fatality, has become a major global public health problem. The 2023 Global Burden of Disease Study led by the Institute for Health Metrics and Evaluation at the University of Washington[1] reported that 626 million people worldwide were living with cardiovascular disease (CVD) and that ischemic heart disease ranked first as a cause of disability-adjusted life years (DALYs). According to the 2024 Annual Report on Cardiovascular Health and Diseases in China[2], the incidence of AMI in China reached 87.6 cases per 100 000 population, with a 30-day case fatality of 5.9%[3].

Percutaneous coronary intervention (PCI)[4] is a minimally invasive technique that relieves coronary stenosis or occlusion through balloon dilation and stent implantation, thereby restoring blood flow to the myocardium. In 1977, Gruentzig introduced percutaneous transluminal coronary angioplasty (PTCA) into

clinical practice[5], and the first PTCA procedure in China was completed in 1984[6]. After more than five decades of development and refinement, PCI has substantially reduced mortality among patients with AMI[7].

The Patient Journey Map (PJM) [8–12] meticulously records and analyzes key touchpoints to identify areas for improvement and bottlenecks in the service process. It presents the emotional fluctuations, symptom burdens, and evolving needs of patients at different stages of treatment in an image format. This method has been widely adopted abroad in the research of care transitions for the elderly, children, patients with chronic diseases, and those with special needs. In China, its application is relatively late and is only used in some chronic disease patients. Considerable research on AMI-PCI care has been conducted in China[13,14], covering psychological and behavioral interventions, rehabilitation, and secondary prevention. However, the findings remain fragmented: many studies focus on a specific stage of disease progression or a single intervention point, and systematic, continuous inquiry covering the entire pre-hospital, in-hospital, and post-discharge course is scarce, leaving family-based care isolated in an information silo. Meanwhile, excessive physical burden, fear of emergency treatment, information overload during hospitalization, and inadequate community health services impose serious constraints on full-cycle management. Against this background, the present study mapped the differentiated experiences and care needs of patients treated with PCI for AMI, in order to provide a reference for delivering individualized nursing interventions and dynamic whole-course management in clinical practice.

Methods

Study design

A descriptive qualitative design was adopted. The patient journey map was constructed in three steps: a desktop review of clinical protocols, guidelines, and patient records; participatory observation during the perioperative period to establish the initial journey framework; and semi-structured patient interviews to refine the experiential details of each phase[8,9]. The reporting of this study followed the Consolidated Criteria for Reporting Qualitative Research (COREQ)[15]. The study was conducted in the cardiology department of a tertiary general hospital in Lianyungang, China, from October to December 2025.

Participants

Participants were recruited by purposive sampling following the principle of maximum variation in qualitative research. Patients with AMI treated with PCI who attended the cardiology department of the study hospital between October and December 2025 were eligible. The inclusion criteria were: (1) meeting the diagnostic criteria for AMI in the 2025 ACC/AHA guideline for the management of acute coronary syndromes[16], including ST-segment elevation myocardial infarction (STEMI) and non-ST-segment elevation myocardial infarction (NSTEMI); (2) first onset of the disease, undergoing emergency PCI in accordance with the Chinese Guideline for Percutaneous Coronary Intervention (2025)[4], with post-

procedural thrombolysis in myocardial infarction (TIMI) flow grade 3; (3) aged 18 years or older; (4) in a stable recovery phase after the procedure, with normal speech and communication abilities, able to recall and describe the medical experience from symptom onset to the present; and (5) voluntary participation with a signed informed consent form. The exclusion criteria were: (1) severe complications such as cardiogenic shock, acute heart failure (Killip class III or above), or malignant arrhythmias; (2) severe hepatic or renal insufficiency, malignant tumor, or other end-stage diseases likely to seriously interfere with the evaluation of the care experience; (3) cognitive impairment, a history of mental illness, or disturbance of consciousness precluding cooperation with the interview; and (4) a history of old myocardial infarction or cardiac surgery. The withdrawal criteria were: (1) dropping out or being unable to complete the study for any reason; and (2) clinical deterioration or the occurrence of serious adverse events. Recruitment continued until data saturation was reached, that is, until no new themes emerged from successive interviews. A total of 33 patients were included; their characteristics are shown in Table 2. The study was approved by the Ethics Committee of The First People's Hospital of Lianyungang (approval no. KY-20260303).

Research team

The research team consisted of six members: one cardiologist, one emergency physician, one cardiology nurse, two catheterization laboratory nurses, and one nursing administrator. Before data collection began, all members undertook systematic training in qualitative research methods, user personas, patient journey maps, and AMI-PCI care to ensure the standardization of the interviews.

Interview guide

The interview guide was developed based on the research objectives, a search of domestic and international databases and official websites related to cardiovascular disease, and consultation with experts in cardiology and qualitative research. Two pilot interviews were conducted with patients 3 months after PCI, and the guide was finalized after repeated revisions. The guide was organized along the timeline of the care pathway and covered symptom management, psychological state, behavioral characteristics, social support, and pain points (Table 1).

Table 1 Semi-structured interview guide by phase of the care pathway

Phase	Interview questions
Emergency phase	(1) How did the discomfort start? Please describe it in detail. (2) How did you get to the hospital? (3) What impressed you most in the emergency department? (4) How did you feel when the pain was most severe, or when you were told that you might be having a myocardial infarction? (5) What difficulties did you encounter? (6) At the critical moment, could you clearly understand the information the medical staff gave you?
Procedure phase	(1) In the catheterization laboratory, which instruments or equipment impressed you most? (2) How did your overall symptoms change during the procedure? (3) What impressed you most during the perioperative period, and did your feelings change? (4) What was the hardest part of the procedure for you?
Hospitalization phase	(1) Did you find the health education provided by the medical staff comprehensive during hospitalization? (2) What most affected your rest and comfort? (3) After returning to the ward, how did you feel as your body gradually recovered? (4) Did you encounter any difficulties during hospitalization?
Rehabilitation phase	(1) After discharge, did you take your medication as prescribed? (2) What changes have you made in diet, exercise, smoking cessation, and alcohol restriction? (3) If chest pain occurred again, did you know what to do? Have you attended follow-up visits on schedule? (4) After discharge, have you experienced physical, psychological, or financial pressure? What has been the greatest difficulty? (5) Do you have any concerns about returning to work? (6) How has the illness affected your family role and daily life? (7) Were there any other problems or needs during the whole process of treatment and recovery?

Data collection

Data were collected through semi-structured interviews and participatory observation. Before the interviews, the researchers established rapport with the participants, reviewed the course of their illness, explained the purpose and significance of the study, and obtained written informed consent. To capture symptom management and lived experience across the whole cycle of treatment and rehabilitation, interviews were conducted at two time points: during hospitalization, face to face in the cardiology office, and 3 months after discharge, by video call. Each interview followed the pre-designed guide, with the wording and order of questions adjusted flexibly according to the participants' answers. With consent, all interviews were audio-recorded, and the interviewers noted the participants' facial expressions and emotional changes in the field notes. Data collection stopped when no new information emerged. Each interview lasted 30 to 40 minutes.

Data analysis

After each interview, the interviewer transcribed the recording verbatim into a text document within 24 hours, and another team member cross-checked the transcript against the recording to ensure consistency; any doubtful information was confirmed repeatedly with the interviewee. The data were analyzed following Colaizzi's seven-step method[17]: (1) two members read the transcripts carefully; (2) statements closely related to the research topic were identified; (3) recurring and meaningful opinions were coded; (4) the codes were aggregated; (5) a detailed, exhaustive description was written; (6) similar opinions were distilled into themes; and (7) the distilled themes and their descriptions were fed back to

the interviewees to confirm the accuracy and rigor of the findings. Taking the whole AMI-PCI care pathway as the narrative background, the team extracted the core points of behaviors, emotions, pain points, and needs at each stage, built the theoretical framework of the journey map, summarized the core themes of each phase, and drew a visual journey map. Finally, two clinical nursing experts evaluated the rationality of its characteristics and nodes.

Rigor

Several measures were taken to ensure trustworthiness. The interview guide was tested in pilot interviews and reviewed by experts in cardiology and qualitative research. Transcripts were verified against the audio recordings by a second researcher, and member checking was performed by returning the distilled themes to the participants. During analysis, the two researchers coded independently and resolved divergent interpretations through discussion. The final journey map was appraised by two clinical nursing experts to confirm the plausibility of the identified characteristics and nodes.

Results

Characteristics of participants

A total of 33 patients with AMI treated with PCI participated in this study, including 27 men and 6 women, with a mean age of 57.0 ± 14.8 years (range, 28 to 82 years). Twenty-one patients (63.6%) had at least one chronic comorbidity, most commonly hypertension, and 10 patients (30.3%) reported a heavy economic burden from the illness. The detailed characteristics of the interviewees are presented in Table 2.

Table 2 General characteristics of the participants (n=33)

Variable	Category	Frequency (n)	PercentAge(%)
Sex	Male	27	81.8
	Female	6	18.2
Age (years)	≤ 40	6	18.2
	41-50	7	21.2
	51-60	6	18.2
	> 60	14	42.4
Infarct location	Anterior wall (including extensive anterior)	18	54.5
	Inferior wall	14	42.4
	High lateral wall	1	3.0
Educational level	Illiterate	5	15.2
	Primary school	10	30.3
	Junior high school	6	18.2
	Senior high school	3	9.1
	Secondary specialized school	1	3.0
	Junior college	4	12.1
	Bachelor's degree	4	12.1
Occupation	Farmer	13	39.4
	Worker	7	21.2
	Retired	6	18.2
	Business person	3	9.1
	Electrician	1	3.0
	Self-media worker	1	3.0
	Professional and technical personnel	1	3.0
	Self-employed	1	3.0
Marital status	Married	29	87.9
	Widowed	2	6.1
	Divorced	1	3.0
	Unmarried	1	3.0

Economic burden	Yes	10	30.3
	No	23	69.7
Comorbiditiesa	Hypertension	16	48.5
	Diabetes mellitus	5	15.2
	Coronary heart disease	3	9.1
	Hyperlipidemia	2	6.1
	Previous cerebral infarction	1	3.0
	Heart failure	1	3.0
	None	12	36.4

a Multiple responses were permitted.

Construction of the journey map

Through reviewing relevant guidelines and consulting with experts, the research team took the emergency warning phase, the catheterization laboratory phase, the in-hospital recovery phase, and the long-term rehabilitation phase as the horizontal axis (time axis) of the journey map, and behaviors, emotions, and pain points as the vertical axis (task axis). The resulting map is shown in Fig. 1.

Emergency warning phase

Behaviors

(1) Neglect of early abnormal symptoms. In some patients, prodromal symptoms such as dull epigastric pain, toothache, and fatigue had already appeared days before the typical symptoms, but the awareness of seeking medical care promptly was weak. P3 said: "I was working on an electrical job when my chest began to ache faintly. I did not think it was serious and took it for chronic gastroenteritis, so I put it off for a whole day." P20 said: "At first my left arm went numb with shooting pains, on and off for three days. I took Chinese herbal medicine during that time and it did not help. When the symptoms got worse, my son called 120."

(2) Rapid care-seeking for typical symptoms. Some patients presented with obvious compressive chest pain accompanied by dyspnea, cold sweats, nausea, and vomiting, and sought medical care immediately. P1 said: "I was playing basketball in the afternoon when my chest suddenly hurt violently, and my teammates rushed me to the hospital." P14 said: "I was having dinner at home in the evening and had drunk some wine, and I got into an argument with my son. Before the argument was over, I felt dizzy, short of breath, and tight in the chest. My son immediately drove me to the hospital."

(3) Confirmation of the AMI diagnosis. All patients arrived at the resuscitation room and cooperated with electrocardiography, echocardiography, and blood tests, though some remained skeptical after the

diagnosis was made. P5 said: "It never occurred to me that I could have a myocardial infarction. I was only 39, and I always thought the risk came around 60." P10 said: "I was first taken to the county hospital, where they diagnosed a myocardial infarction. The doctor gave me a packet of medicine to take by mouth and suggested transferring me to the city hospital. By the time I got there, I felt much better, and I thought I had been misdiagnosed."

Emotions

(1) Fear and illness uncertainty. In most patients, the worsening physical symptoms were accompanied by fear of death and uncertainty about disease progression. P16 said: "The alarms of all kinds of machines kept going off in the resuscitation room, and the chest pain became more and more obvious. I was terrified and had no idea what would happen to me." P30 said: "I am old and know little about myocardial infarction. My family was anxious and afraid that I would not make it through."

(2) Anxiety and worry. Middle-aged and young patients faced health problems and life pressures, showing severe anxiety and worry. P1 said: "I just graduated from university five years ago and my work has just settled down. Will the surgery affect the intensity of my work? Will it affect my fertility?" P15 said: "When symptoms occurred, I immediately took the quick-acting heart-protecting pill. I am the pillar of my family, with parents above and children below. After getting sick, the expenses are huge. Can my body recover to its previous state? I failed to take good care of the family."

(3) Acceptance without regret. A very small number of elderly patients handled the disease calmly and were full of hope for the prognosis. P19 said: "The city hospital is the highest medical level in our city. I trust the doctors. Lying in the emergency room of the city hospital, I am full of hope." P33 said: "My children have married and fulfilled their responsibilities. I have enjoyed all the pleasures in life. I can accept all the ups and downs."

Pain points

(1) Insufficient risk perception. After the patient experienced symptoms, their awareness of risk was insufficient, resulting in a delay in the treatment time for acute myocardial infarction. P19 said: "I thought it was an old problem with my respiratory system. Only when my son took me to the hospital and I was told it was a myocardial infarction did I realize how serious it was." P20 said: "I am in good shape and exercise at home all the time. I never imagined a myocardial infarction, or what its symptoms would be."

(2) Scarcity of pre-hospital emergency resources. For some patients living in remote areas or working far from home, emergency resources were scarce and immediate transfer to hospital was impossible. P8 said: "I work far from home. When my chest felt uncomfortable, I was at the construction site in another city and could only take quick-acting heart pills. I first went to the local county hospital, which then advised me to transfer to the city hospital. A lot of time was lost." P17 said: "I had chest tightness 15 days earlier and first went to the village clinic, where nobody suspected a heart problem. Later, when the chest pain became unbearable, the 120 ambulance took me to the city hospital."

(3) Limited disease-related knowledge. P2 said: "I had only heard of myocardial infarction on the phone and on television. I never looked into it." P28 said: "I look after my grandchildren at home every day. I had never paid attention to myocardial infarction."

Catheterization laboratory phase

Behaviors

(1) Cooperating with the procedure. Most patients suffered severe chest pain, profuse sweating, a sense of impending death, nausea, and vomiting, and had to maintain a supine position for a long time, which made cooperation difficult. P12 said: "The chest pain was severe. I lay motionless throughout the operation, and the nurse asked me to hold on a little longer. The whole process was very uncomfortable." P14 said: "On the operating table I could see the imaging screens around me. I felt nauseated, vomited a lot, and then everything went black and I was covered in sweat. The doctors and nurses kept calling my name, and when I came round the operation was already over. It felt like a trip through the gate of hell."

(2) Engaging in intraoperative communication. The surgical team communicated with patients during the procedure and monitored their physical and psychological state in real time. P4 said: "At every step, such as injecting the contrast agent, inflating the balloon, and releasing the stent, the doctor told me what was happening. I felt very much involved." P22 said: "Everything was done against the clock. The doctor told me that the stent had been placed, and after the operation my symptoms eased a lot. The effect was obvious."

Emotions

(1) Loneliness and helplessness. The catheterization laboratory was an unfamiliar environment without family accompaniment, and patients described feeling lonely. P1 said: "I was pushed into the operating room alone. The staff all wore masks and caps, and I could not tell who was the doctor and who was the nurse. I felt terribly lonely and helpless." P13 said: "I am already fifty and had never been through anything like this. Lying on the operating table, I felt helpless, as if my life were in someone else's hands."

(2) Hypervigilance. Some patients paid excessive attention to every detail of the procedure and worried about its outcome. P15 said: "The operating doctors were fully absorbed, and I could not help watching the imaging screen. The slightest movement made me nervous." P2 said: "Every word of concern from the staff during the operation made me wonder whether something had gone wrong, and whether I would get through it."

(3) Composed acceptance. A few patients demonstrated a high level of cooperation in seeking medical treatment and strong psychological resilience. P6 said: "I had learned about myocardial infarction before, my family got me to hospital quickly, and I trusted the hospital. I did not feel afraid during the operation; I took it as an experience of life." P31 said: "During the operation I heard the doctor say it went smoothly, and I felt relieved that I could see more of this world."

Pain points

(1) Physical overload. AMI starts abruptly, with severe symptoms that progress quickly. Almost all patients suffered distressing symptoms that placed a heavy burden on the body. P15 said: "Throughout the entire process, there was severe pain in the chest, back and shoulders, accompanied by nausea and vomiting. I simply didn't have any energy to focus on anything else." P29 said: "The chest pain was like being sawed through, and it went on and on, getting worse and worse. In the catheterization laboratory I felt I could not bear it any longer."

(2) Communication barriers between doctors and patients. Patients lack knowledge of the specialized knowledge related to acute myocardial infarction or are worried about the disease, resulting in information barriers during communication. P11 said: "During the surgery, the doctor would inform me of the situation in real time, such as removing blood clots and placing stents, but many technical terms were beyond my comprehension and I was afraid to ask. The communication effect was not good." P9 said: "I just wanted the surgery to end quickly. I didn't care much about how the surgery was performed. The content the doctor said, I didn't pay much attention to either."

(3) Lack of psychological support. There is no family member accompanying the patient in the catheterization room, only various instruments and equipment. Most patients experience anxiety and a sense of helplessness, and the psychological support is lacking. P16 said: "During the surgery, the doctor focused on the operation, although the nurse often asked about my feelings, the warmth was not high, and the experience was not good." P26 said: "During the operation, there was a large machine rotating around, and some medical staff stood behind the glass panel, the sense of distance was too strong."

In-hospital recovery phase

Behaviors

1. Postoperative symptom management behaviors. Most patients followed the doctor's instructions, such as bed rest, passive activities, quitting smoking and drinking, taking medication for recovery, etc. P3 said: "During the acute period after CCU surgery, I paid special attention to the changes in my body parts and strictly practiced finger exercises according to the guidance of the medical staff, taking medicine on time." P23 said: "After the surgery, I felt reborn. The nurse instructed me to exercise gradually, starting from sitting beside the bed, then walking in the ward, and also to pay attention to heart rate and blood pressure."
2. Establishing a care support system behaviors. All patients during hospitalization need family care support. P16 said: "During hospitalization, the diet required low salt and low fat, and it was always my daughter who brought meals." P27 said: "My husband is also in poor health. These days, his getting out of bed for activities is supervised by his children."

(3) Seeking peer education. Public accounts, WeChat groups, hospital environment, etc., provided communication and exchange platforms for patients. P5 said: "We will exchange symptoms, diet, family,

etc. and can also regain confidence from the conversations with fellow patients who have recovered." P24 said: "The neighbor bed in CCU was the second hospitalization surgery for him. He encouraged me to take medicine on time and exercise."

Emotions

1. Insufficient understanding of the role. Some patients overly focus on the disease itself, while others are negligent in management and fail to control the risk factors adequately. P3 said: "After experiencing an acute myocardial infarction, I gained a new understanding of life. A stent was implanted in my heart, and even breathing is done with great care. I'm afraid the stent might shift after activity." P22 said: "After the surgery, I didn't feel any discomfort. I thought I could be discharged, but the doctor still asked me to stay in bed for rest."
2. Concerns about economic burden. Some patients worry about the economic burden brought by long-term disease recovery. P2 said: "I'm the main breadwinner of my family. Before getting sick, I was engaged in physical labor. The doctor told me to change my job, and life became extremely difficult." P15 said: "We are farmers. Our family has no fixed income. The monthly cost of taking medicine is very high."

(3) Anxiety about prognosis. P17 said: "After having a stent implanted in the heart, will there be a recurrence?" P31 said: "I had hypertension and high cholesterol before, and I also took antihypertensive drugs in the hospital, but I didn't take them on time. Now, with multiple diseases combined, I don't know if it will affect the surgical outcome?"

Pain points

(1) Insufficient individualized health education. Most patients lacked specialized knowledge and had urgent needs after the operation. P2 said: "I went online every day to learn about the medication and rehabilitation, but the information was not systematic and there was no individualized plan for my own condition. I felt rather lost." P12 said: "The nurse explained the postoperative precautions to us, but we could not remember them and had to check again and again."

(2) Lack of professional rehabilitation training. Rehabilitation training lacked a professional assessment process, and almost all patients were unaware of key dimensions such as the timing of rehabilitation, the type of exercise, and its intensity and frequency. P4 said: "The doctor only said I should get out of bed and move around appropriately, but how much is appropriate?" P19 said: "I asked the nurse how many steps were suitable, and she said, 'just don't tire yourself.' I was afraid of overdoing it and of doing too little for it to help."

(3) Nutritional misconceptions. Without professional nutrition guidance, patients fell into various dietary misconceptions. P6 said: "After the operation I thought I needed to build up my strength, so I had chicken soup and bone soup every day without repeat." P12 said: "The nurse told me to keep a low-salt, low-fat diet, so I stopped eating meat and eggs altogether and lost nearly 2.5 kilograms."

Long-term rehabilitation phase

Behaviors

1. Self-rehabilitation management behaviors. Most patients actively adjusted their dietary structure and daily routines after discharge, and gradually carried out home exercise training. P6 said: "After returning home, I quit smoking and limited alcohol consumption, maintained a regular schedule, and took medication on time every day. At the same time, I strictly followed the doctor's instructions for diet. The exercise intensity was a bit high, with 5 hours of exercise per day." P32 said: "As I got older, living on the 8th floor made it inconvenient to go downstairs. I walked around at home with a crutch every day and monitored my heart rate changes after exercise."
2. Regular health assessment behaviors. Most patients actively participated in regular health assessments and cooperated with follow-up check-ups. P2 said: "We strictly followed the doctor's requirements for the check-ups, but recently my lower limbs have been bruised frequently. I am preparing to go to the hospital for further consultation and examination. I cannot be careless." P21 said: "I had regular check-ups one month and three months after discharge. However, there was still a soreness and heaviness in the upper arm of the puncture site, and I have been paying attention to it."

(3) Return to work behavior. Some patients overestimated their recovery and returned to work prematurely. P4 said: "The pressure of life was high. I returned to my original position as an architectural designer one month after discharge, and traveled to the construction site 5 hours a day. The intensity was quite high." P7 said: "Now it's not easy to find a job. The position cannot remain vacant. One month after discharge, I was responsible for the security post and took night shifts. I tried to ensure sufficient sleep during the day as much as possible."

Emotions

(1) Post-traumatic stress reaction. A small number of patients were cautious about cardiac rehabilitation after surgery. P17 said: "The doctor said not to lift heavy things, so now I do no housework at all and just lie in bed resting. I feel that is the safest." P19 said: "Having been through the whole course of a myocardial infarction, even though the doctor told me I could gradually resume exercise, I am afraid that any exercise will burden my heart."

(2) Worry about future cardiovascular events. Some patients stayed alert to their long-term prognosis and feared potential complications. P13 said: "With a stent in my heart, I am afraid of in-stent restenosis, thrombosis, arrhythmia, and other complications later on." P4 said: "I am afraid that working too hard will bring on another myocardial infarction."

(3) Relief and equanimity. A few patients kept an open mind and engaged actively in rehabilitation. P21 said: "Having been through cerebral infarction and a myocardial infarction, I am no longer afraid of any

storm." P33 said: "At my age, making it through the gate of hell is a blessing. Now I try to live each day well, following the advice of the doctors and my children."

Pain points

(1) Lack of individualized rehabilitation training. Almost all patients said they lacked continued guidance from a professional rehabilitation team. P15 said: "There is no well-developed cardiac rehabilitation center nearby, and the community hospital has no professional rehabilitation team. Our rehabilitation depends entirely on searching the internet and asking at follow-up visits." P16 said: "Apart from some simple exercise advice from the doctor, there is no follow-up department to assess or guide me. I do not know which stage of recovery I have reached, or when I can move on to the next stage."

(2) Absence of psychological counseling. Patients reported a lack of psychological support and mutual aid during recovery. P1 said: "I would like to talk more with people around me and rebuild my confidence, but there is no channel for that. I feel like I am fighting alone." P13 said: "After returning home, the financial and physical burdens were heavy, and without professional psychological counseling I often could not sleep well."

(3) Insufficient social support. The support from some patients' families and society had declined. They lack emotional comfort and practical assistance. P4 said: "After returning to work, I can no longer engage in heavy physical labor, but the company has no flexible arrangements, and I am forced to struggle on every day." P11 said: "After being discharged from the hospital, everyone is busy with their work, and there is very little time for being cared for and supported."

Discussion

This study employed a patient journey map, with the timeline as the horizontal axis and behaviors, emotions, and pain points as the vertical axes, to present the needs of patients with acute myocardial infarction (AMI) who underwent percutaneous coronary intervention (PCI) during the emergency warning phase, the catheterization laboratory phase, the in-hospital recovery phase, and the long-term rehabilitation phase. The journey map identifies the staff involved in health management at each stage of diagnosis, inpatient treatment, and long-term self-management, and provides a basis for delivering support resources to patients in a personalized, dynamic, and precise manner.

Building an intelligent pre-hospital emergency care system to address scarce emergency resources and insufficient public knowledge

The results of this study showed that, during the emergency warning phase, patients tended to ignore prodromal symptoms and had difficulty obtaining emergency care, which wasted part of the time window for reperfusion therapy. This is consistent with the findings of Petrova et al.[18] and Biswas et al.[19] and reflects the weak cardiovascular health literacy of the public and the insufficient coverage of primary emergency care networks. Although in-hospital processes have been optimized, pre-hospital neglect and

difficulty in accessing resources remain critical: every 30 minutes of delay increases the risk of death by 7.5%[20]. In response to these pain points, we propose the following. First, the focus of the medical and health system has shifted from D2B time to the starting point of the entire emergency response chain. Primary hospitals have the capability to transmit electrocardiograms, and the "circumventing the emergency room" process has been promoted. Once the ambulance's electrocardiogram confirms myocardial infarction, it bypasses the consultation and registration processes and directly reaches the catheterization room, reducing the preoperative preparation time. Second, the "emergency map" could be released through a WeChat mini-program. The system automatically matches nearby hospitals based on geographical location to avoid secondary referrals from primary hospitals. Third, relying on the information platform of regional chest pain centers, vital sign data collected by wearable devices or mobile applications[21] could support an integrated system of intelligent recognition, one-touch calling, and video guidance, using artificial intelligence for early risk warning. Fourth, for young and middle-aged high-risk groups (such as men, smokers, patients with hypertension, and those in high-pressure occupations), medical staff should deliver targeted health education through WeChat public accounts, short videos, and live streaming, encouraging high-risk individuals to pay attention to prodromal symptoms and seek care promptly, so as to shorten treatment delay at its source.

Extending psychological care across the whole care cycle to address inadequate psychological support and difficulties in social role adjustment

The present study showed that the psychological state of AMI-PCI patients changes progressively: fear of death and illness uncertainty in the emergency warning phase; loneliness and helplessness in the unfamiliar environment of the catheterization laboratory; anxiety and low mood over financial burden and prognosis during hospitalization; and post-traumatic stress responses and difficulties adapting to social roles during long-term rehabilitation. Psychological problems therefore run through the entire care cycle and are accompanied by multidimensional psychosocial adaptation disorders, consistent with the study by Liang et al.[22]. In clinical practice, however, psychological support remains fragmented[23]. After discharge, patients encounter an information silo and social isolation[24], and a systematic and complete psychological intervention cycle is lacking. Considering these pain points, we recommend: first, phased psychological assessment and stratified intervention during hospitalization to identify high-risk groups, with structured cognitive behavioral interventions delivered by psychologists; second, greater attention to psychological support for patients in the catheterization laboratory, where circulating nurses and physicians should actively reassure patients and explain the procedure to relieve loneliness and helplessness; third, during rehabilitation, building a psychological intervention network of "professional support, peer assistance, and family participation," creating WeChat support groups in which recovered patients volunteer as peer supporters and regularly share coping experience and psychological adaptation skills; fourth, encouraging family members to participate in the whole process, developing nursing support plans to help them understand patients' emotional fluctuations and master effective communication and emergency response skills; and fifth, for young and middle-aged patients facing difficulties in social adaptation, having the rehabilitation team assess social functioning, including the

nature of their work, physical demands, willingness to return to work, and potential obstacles, and assisting them in communicating with employers to adjust working conditions, thereby restoring their occupational identity and sense of social belonging.

Establishing a hospital-community-family model of continuous rehabilitation to address inadequate rehabilitation referral

This study found that after discharge, patients faced pain points such as the lack of professional rehabilitation guidance, gaps in community rehabilitation resources, misconceptions about nutritional support, and low awareness of the need for cardiac rehabilitation, which is consistent with the findings of Beatty et al.[25]. As stated by the American Heart Association, the American Association of Cardiovascular and Pulmonary Rehabilitation, and the Agency for Healthcare Research and Quality, comprehensive cardiac rehabilitation reduces the incidence of adverse cardiac events, rehospitalization, and mortality and improves quality of life[26]. To address the pain points identified above, a multidisciplinary team comprising cardiologists, rehabilitation specialists, dietitians, and psychologists should jointly formulate the "five prescriptions" (medication, exercise, nutrition, psychology, and smoking cessation). Dietitians should develop individualized nutrition prescriptions and a nutrition mini-program to monitor daily dietary intake in real time and help patients establish their own dietary principles. Cardiac specialty nurses should take on pre-discharge assessment of rehabilitation needs, formulation of individualized care plans, coordination of post-discharge follow-up, and liaison among the hospital, the community, and the family, acting as "connectors" in a service chain that extends from the hospital to the community and the family. A hospital-community-family integrated rehabilitation service model should be established: tertiary hospitals serve as treatment and assessment centers, undertaking exercise tolerance testing, management of high-risk patients, and initial prescription formulation; community hospitals are responsible for rehabilitation supervision, basic patient monitoring, and consultation; and the family is the main site of rehabilitation, carrying out daily exercise, self-monitoring, and basic rehabilitation tasks. Follow-up, remote exercise guidance, and health education can be delivered through mobile applications or WeChat platforms, reducing patients' dependence on unverified online information. With the help of digital health platforms and wearable devices[27], electrocardiographic exercise monitoring can be carried out, with nurses interpreting the data, issuing abnormality alerts, and conducting remote follow-up as the "implementers and leaders" of the technology.

Limitations

This study has several limitations. First, it was based on interview data from a single center, and the data may be limited by patients' subjective recall and expression, with a certain degree of bias. Second, the participants did not cover patient experiences from different regions or diverse populations, so the transferability of the findings is restricted. Third, the study focused on patients' own perspectives; the views of family caregivers and healthcare providers were not collected, although they are also important stakeholders in full-cycle management. Future research should expand the scope of the study, combine

quantitative methods, include family members and healthcare providers, and further improve clinical improvement strategies and the application of intelligent tools.

Conclusion

The results of this study indicate that the behaviors, emotions and pain points of AMI-PCI patients exhibit a phased characteristic. Medical staff provide precise and dynamic intervention strategies based on the patient journey nodes, which improve the long-term quality of life of patients and enhance the overall disease management level of patients throughout the cycle. However, this study is based on single-center interview data, and the data may be limited by the subjective recollection and expression of patients, resulting in certain bias. Moreover, it fails to cover the patient experiences of different regions and diverse populations. Future research can expand the research scope, combine quantitative research methods, and improve clinical improvement strategies and the application of intelligent tools.

Abbreviations

AMI: Acute myocardial infarction; PCI: Percutaneous coronary intervention; PJM: Patient journey map; CVD: Cardiovascular disease; DALY: Disability-adjusted life year; PTCA: Percutaneous transluminal coronary angioplasty; STEMI: ST-segment elevation myocardial infarction; NSTEMI: Non-ST-segment elevation myocardial infarction; TIMI: Thrombolysis in myocardial infarction; CCU: Coronary care unit; COREQ: Consolidated Criteria for Reporting Qualitative Research; ACC/AHA: American College of Cardiology/American Heart Association

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of The First People's Hospital of Lianyungang (approval no. KY-20260303). Written informed consent was obtained from all patients.

Consent for publication

All authors have read and approved the final version of the manuscript and agree to its publication in BMC Health Services Research.

Availability of data and materials

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

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. And, no particular grant was given for this study by governmental, private, or nonprofit funding organizations.

Authors' contributions

Conception and design of the study: Na Lv, Yan Yang.

Acquisition of data: Na Lv, Xiaoyan Hu, Jie Zhang.

Data transcription and analysis: Jian Wu.

Interpretation of the data: Yan Yang, Na Lv.

Drafting of the manuscript: Na Lv.

Critical revision of the manuscript for important intellectual content: Yan Yang.

All authors read and approved the final manuscript.

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Figures

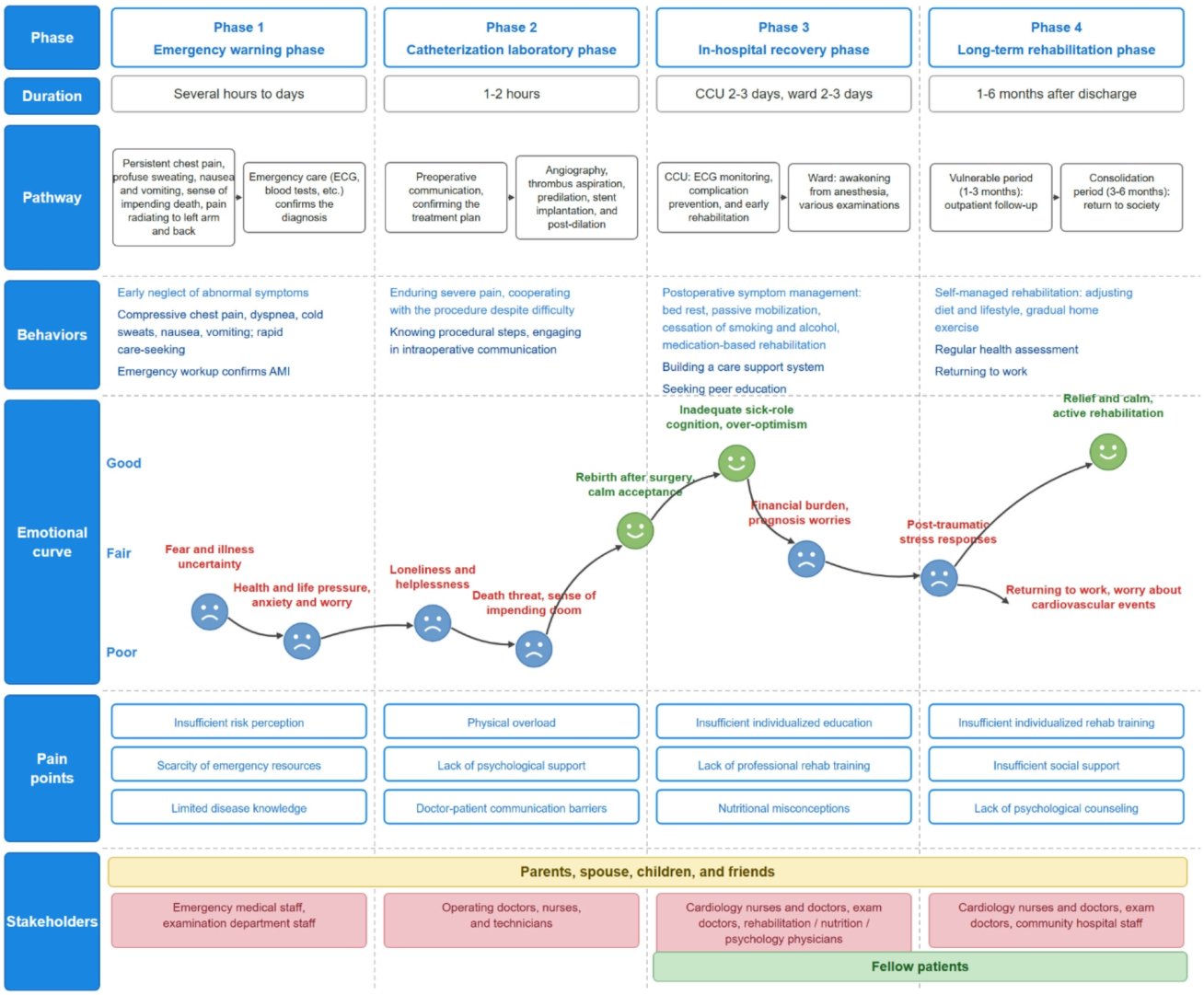


Figure 1

Patient journey map of patients undergoing PCI for acute myocardial infarction. The horizontal axis represents the timeline of care (emergency warning phase, catheterization laboratory phase, in-hospital recovery phase, and long-term rehabilitation phase), and the vertical dimensions include the care pathway, behaviors, emotional curve, pain points, and stakeholders involved at each phase.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- InterviewQuestionnaire.doc