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A qualitative study on the symptom experience and self-management strategies of patients undergoing chemotherapy and radiotherapy for esophageal cancer

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Abstract

To investigate the symptom burden and self-management strategies in esophageal cancer patients undergoing chemoradiotherapy,and to establish a foundation for developing symptom management interventions, this research adopted a qualitative method using purposive sampling. The sample was selected from 19 esophageal cancer patients who were inpatients at a tertiary hospital in Nanjing, China, from December 2022 to June 2023. All of them were undergoing radiotherapy and chemotherapy. The research method was semi-structured in-depth interviews. The content of the interviews was summarized and analyzed with Colaizzi's seven-step method. The content was divided into three categories and several topics. Category 1 (core symptoms) mainly included dysphagia, treatment-related toxicities (chemotherapy-induced adverse reactions), and reflux-associated symptoms (including chronic cough). Category 2 (barriers to managing symptoms) included maladaptive coping behaviors, escalation of psychological distress, lacking information, and change in the social roles. Category 3 (management approaches) included adopting a more healthy dietary and habits, gaining more support from social networks, and maintaining a positive attitude. The patients of esophageal cancer suffer from the major symptoms of chemoradiotherapy. To face the impact of multiple symptoms, some patients used positive strategies to deal with the problem successfully and gained social support; their symptoms were relieved effectively and the patients' quality of life improved. These findings provide a strong proof for discussing individualized self-care practices.

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Introduction

Esophageal cancer is one of the most common malignancies of the digestive tract, accounting for approximately 300,000 deaths worldwide annually[1]. Concurrent chemoradiotherapy (CCRT) is the standard treatment for locally advanced esophageal cancer and has been shown to improve survival rates. However, this therapy is associated with numerous acute symptoms and long-term side effects that substantially impair the patients' quality of life. Studies report that over 80% of patients undergoing CCRT experience moderate to severe symptom clusters, contributing to higher treatment discontinuation rates and potentially unfavorable prognoses[2].

Current research primarily emphasizes clinician-directed symptom management, such as pharmacological analgesia and nutritional support. In contrast, patients' subjective symptom experiences, psychosocial adaptation, and individualized coping strategies remain inadequately explored. In clinical practice, interventions are often delayed or suboptimal as a result of patients' under-reporting of them, difficulty articulating symptoms, and limited self-management abilities[3]. Moreover, CCRT-induced symptoms present dynamic and multidimensional characteristics, involving complex physiological–psychological–social interactions that conventional quantitative methods are insufficient to capture.

The concept of symptom experience was defined and refined by nursing scientist Armstrong at the University of Texas at Houston[4], who first elucidated its multidimensional nature. This framework comprises:

· Symptom events: Referring to the frequency, duration, and severity of symptoms.

· Symptom distress: Reflecting the patient's affective and perceptual response to symptoms, including discomfort, anxiety, and suffering.

· Symptom perception: Encompassing the patient's awareness and self-efficacy in managing symptoms.

Over the past decades, several theoretical models have been developed to guide symptom management[5−7]. Among these, the Theory of Unpleasant Symptoms (TOUS), initially proposed and refined by Elizabeth R. Lenz, Fellow of the American Academy of Nursing[8], stands as a foundational framework. It has been recognized as a research priority by institutions such as the National Institute of Nursing Research and the American Academy of Hospice and Palliative Medicine.

The TOUS comprises three core concepts: Influencing factors, symptom characteristics, and consequences. This study focuses on the inter-relationships among these elements. Influencing factors include:

· Physiological factors: Related to the functioning of body systems;

· Psychological factors: Reflecting mental states, emotional conditions, and affective responses to illness (e.g., anxiety and depression);

· Situational factors: Encompassing external influences such as social support and socioeconomic status.

These factors may interact and collectively influence symptoms' manifestation. Symptoms in the TOUS model are characterized across four dimensions, namely intensity, distress, timing, and quality, which may interact and exacerbate one another. Furthermore, symptoms often cluster synergistically, increasing the overall symptom burden.

The consequences component of the TOUS links symptoms to functional outcomes, including activities of daily living (ADLs) and self-care capacity. The model posits that symptoms directly affect functional performance, and these outcomes dynamically interact with both the influencing factors and the symptoms themselves.

Recent applications of the TOUS have expanded to examine symptom clusters in cancer populations. However, most studies employ quantitative methodologies focused on symptoms' prevalence, with a scarcity of qualitative or intervention-based research. For instance, studies applying symptom management theory have identified correlations among chemotherapy cycles, disease duration, platelet/leukocyte counts, alanine aminotransferase (ALT) levels, and symptom cluster severity in lung cancer patients[9]. So et al.[10] reported an inverse relationship between fatigue symptom clusters and self-care capacity, while noting a positive correlation between social support and self-care performance. Similar longitudinal studies have been conducted among patients with post-hepatitis cirrhosis[11], though few have advanced to developing cluster management strategies.

Qualitative studies applying symptom management theory have revealed physical–psychological distress and coping mechanisms in patients with corneal ulcers[12]. Research on lung cancer symptom clusters highlighted self-reliant coping behaviors stemming from insufficient support, leading to the proposal of a contextual theoretical model[13]. Ren et al.[14] found that esophageal cancer patients with greater postoperative symptom distress exhibited higher support needs. Nevertheless, few studies have focused on the symptom experiences of patients undergoing CCRT for esophageal cancer or explored the challenges from the patients' perspective.

Therefore, this study used a phenomenological approach to investigate the symptom experiences and coping strategies of esophageal cancer patients during CCRT. The aim is to inform the development of targeted interventions that alleviate symptom burden and enhance quality of life.

Study information and methodology

General information

A purposive sample of 19 inpatients with esophageal cancer undergoing CCRT was recruited from a tertiary hospital in Nanjing, China, between December 2022 and June 2023. Inclusion criteria were (1) newly diagnosed esophageal cancer patients receiving first-course chemoradiotherapy, (2) the ability to consume a semi-liquid diet, (3) age between 18 and 80 years, (4) Barthel Index score ≥ 40, and (5) voluntary provision of informed consent. Exclusion criteria included (1) cognitive or psychiatric impairments; (2) severe cardiopulmonary, hepatic, or renal dysfunction; (3) age ≤ 16 years, pregnancy or lactation, or terminal illness with extreme debilitation; (4) family refusal to disclose treatment progress; and (5) previous chemoradiotherapy retreatment. The sample size was determined and iteratively adjusted on the basis of the patients' profiles and thematic saturation[15]. To ensure confidentiality, all participants were assigned alphabetic codes. Their demographic characteristics are summarized in Table 1.

Table 1. Statistical facts of the participants

Parameters		Values
Gender	Male	15
	Female	4
Age range (years)	Male	43–74
	Female	56–78
Marital status	Married	13
	Widowed	4
	Single	1
	Divorced	1
Educational background	Primary school	4
	Junior high	9
	Vocational degree	2
	High school	3
	Bachelor Degree	1
Location of esophageal cancer	Upper segment	3
	Cervical esophagus	1
	Middle segment	8
	Lower segment	7
Stage	II	4
	III	15
Therapy method	Radiotherapy	3
	Chemoradiotherapy	16

Methodology

Data collection

A qualitative phenomenological approach was employed, using semi-structured interviews for data collection[3]. With input from a preliminary literature review[16], a panel of qualitative research experts developed the interview guide. Key topics included the most distressing symptoms experienced during chemoradiotherapy; patients' perceptions, attitudes, and behaviors regarding symptom self-management; actual needs in symptom management; healthcare providers' perspectives on patients' discomfort and coping abilities; and strategies to improve patients' coping confidence. Two pilot interviews were conducted, and the final interview protocol was refined through panel discussions. Pilot questions included: (a) 'Could you describe the symptoms that have been most distressing to you recently?', (b) 'How have you been coping with these symptoms?', (c) 'How would you evaluate your current ability to manage or control these symptoms?', (d) 'Have you successfully managed similar symptoms in the past? If so, what contributed to your success?', (e) 'What challenges have you encountered while managing these symptoms?', and (f) 'What support have you received so far, and what additional assistance would you expect from healthcare providers?'

Eligible patients were identified via the hospital information system and contacted to confirm their eligibility. Before each interview, the purpose and significance of the study were thoroughly explained. Participants were informed that the interviews would be audio-recorded and were assured of data confidentiality. The interview team comprised an experienced oncology head nurse and a graduate student trained in qualitative methods. Trust was established with the participants and their families before proceeding.

Each participant completed a brief demographic questionnaire. One-on-one interviews were conducted in a private health education room to ensure a comfortable and anxiety-free environment. Interviews lasted 40–60 minutes and were audio-recorded. Interviewers remained attentive to the participants' emotional states and nonverbal cues, avoiding interruptions. All recordings were transcribed verbatim, supplemented with field notes capturing nonverbal expressions.

Additionally, symptom severity was assessed using the two-dimensional Esophageal Cancer Symptom Assessment Scale, developed by Hu Xiaodong et al.[17] via the Delphi expert consultation method. This validated scale includes 31 items rated on a four-point Likert scale (1 = 'rarely present' to 4 = 'persistently present'), with higher scores indicating greater symptom severity. The scale demonstrated strong psychometric properties, with Cronbach's α ranging from 0.722 to 0.937 across subscales and a cumulative variance contribution rate of 73.091%.

Data analysis

Data collection and analysis were conducted concurrently. Audio recordings and field notes were transcribed, organized, and cross-verified. Nonverbal expressions were documented systematically. Data were analyzed using Colaizzi's seven-step phenomenological analysis method to identify the emergent themes and patterns.

Quality control

This study was approved by the Ethics Committee. All participants provided written informed consent. The participants were selected to represent a range of sociodemographic (age, gender, marital status, education, residence, employment) and clinical characteristics (tumor location, disease stage, treatment modality). Interviewers used probing, questioning, and paraphrasing techniques to elicit in-depth responses. Interview transcripts were returned to participants for member checking to ensure accuracy and completeness of the data.

Research outcomes

Symptom severity and prevalence

During radiotherapy, patients experienced multiple symptoms with varying incidence and severity. The 17 most frequently reported symptoms (occurrence rate: 31.58%–73.68%) included fatigue, weight loss, dry mouth, decreased appetite, dysphagia, odynophagia, sleep disturbances, reflux, nausea, anxiety, alopecia, and pruritus. Among these, odynophagia, dysphagia, reflux, nausea, vomiting, decreased appetite, xerostomia, fatigue, sleep disorders and alopecia were notably severe in Table 2.

Table 2. Symptom distress index during chemoradiation in esophageal cancer patients ($n = 19$).

Symptoms	Cases	Percentage	Distress index
Fatigue	14	73.68%	2.60 ± 0.978
Weight loss	13	68.42%	2.37 ± 0.877
Dry mouth	12	63.16%	2.78 ± 0.917
Decreased appetite	12	63.16%	2.78 ± 0.964
Swallowing difficulty	11	57.89%	3.23 ± 0.870
Painful swallowing	11	57.89%	3.52 ± 0.939
Sleep disturbances	10	52.63%	2.53 ± 0.986
Reflux	10	52.63%	2.95 ± 0.828
Nausea	9	47.37%	2.79 ± 0.948
Anxiety	9	47.37%	2.47 ± 0.961
Hair loss	9	47.37%	2.53 ± 0.870
Skin changes	9	47.37%	2.09 ± 1.017
Skin itching	8	42.11%	2.15 ± 0.976
Feeling sadness	8	42.11%	2.38 ± 0.968
Altered taste	8	42.11%	2.21 ± 0.997
Fullness after eating	8	42.11%	1.47 ± 0.791
Vomiting	6	31.58%	2.79 ± 0.905

Theme 1: Symptom experiences during treatment

Dysphagia-related symptoms

Patients reported multiple symptoms related to dysphagia, including painful swallowing, appetite loss, food obstruction, significant weight loss, anxiety, and profound distress. Patient B (74 years old) stated: 'Swallowing is extremely difficult—food sticks to my esophageal wall, causing terrible pain…'

Three other patients described severe dysphagia accompanied by throat and abdominal pain during eating or drinking. They perceived food as being trapped in the throat or esophagus caused by tumor obstruction, resulting in considerable difficulty in swallowing. Patient M (78 years old) reported: 'Eating rice causes choking—I experience this feeling after every meal.'

Pain, obstruction sensation, and mechanical dysphagia often co-occurred, showing clear interconnections and progressive escalation. Weight loss was commonly observed. Patient D (56 years old) said: 'I'm concerned about my weight—when I looked in the mirror, I realized I've lost so much, at least 10–15 kilograms since getting ill.'

Mid-radiotherapy exacerbation of odynophagia and dysphagia resulting from radiation-induced esophagitis and mucosal edema was also reported. Patient H (65 years old) shared: 'In the beginning, I couldn't eat well, but after about 10 cycles of treatments, I felt the situation was getting better somewhat and the obstruction feeling lessened before. Why is the situation getting worse again recently? Now I'm afraid to eat—I can't swallow properly and the pain is unbearable; it hurts even drinking water. I've lost 10 kilograms since being an inpatient. Does this mean the treatment isn't working?'

Similarly, Patient F (66 years old) noted: 'I have no appetite and don't want to eat. When I try to swallow food, it feels stuck in my chest.'

Treatment-related adverse reactions

Common adverse reactions include nausea, vomiting, pain, alopecia, constipation, dry mouth, fatigue, and dizziness. Constipation and pain were particularly prominent. Over half of the participants reported constipation from analgesic use, leading to laxative consumption and subsequent diarrhea. Patient K (51 years old) described: 'I frequently experience constipation from the pain medications. When I take laxatives for relief, I sometimes get diarrhea, but then the constipation returns.'

Alopecia was another distressing effect. Patient G (43 years old) reported: 'At first it was manageable—just some hair loss when combing. Now my hair falls out in clumps at the slightest touch, so I shaved it all off. Appearance doesn't matter anymore.'

Radiotherapy-induced xerostomia was also frequently mentioned. Patient M (78 years old) stated: 'The radiation causes severe dry mouth—I often wake up parched at night and drink two full bottles of water.'

Others reported vertigo and generalized weakness. Patient S (69 years old) commented: 'I feel constantly weak and dizzy. Without holding onto walls, I'd fall. Even with my eyes open, the room seems to spin.'

Reflux- and cough-associated symptoms

Symptoms such as heartburn, shortness of breath, and sleep disturbances resulted from reflux and coughing. Digestive tract anatomical changes post-esophagectomy compromised anti-reflux function, leading to appetite loss and frequent reflux. Two patients highlighted how reflux and heartburn severely affected their sleep, causing multiple nighttime awakenings and subsequent daytime fatigue. Gastric discomfort, coughing, sleep disturbances, and fatigue often appeared concurrently.

Patient E (68 years old) shared: 'It feels like my stomach is burning, and fluid keeps rising up to my throat day and night, especially when I wake up late at night or early in the morning. The stomach discomfort prevents me from sleeping, leaving me exhausted the next day.'

Patient J (69 years old) said: 'I suffer from severe acid reflux that forces me awake from sleep, followed by vomiting stomach acid.'

Patient R (70 years old), who underwent radical esophagectomy, noted: 'In the day, I don't feel anything uncomfortable while I am standing, but when lying flat at night, especially between midnight and 1 AM, reflux occurs frequently.'

Theme 2: Ineffective coping strategies in symptom management

Emotional distress

Poorly managed symptoms, physical discomfort, and side effects of medication contributed to negative emotional states. Patients reported a perceived loss of bodily function and self-reliance, leading to anxiety and shame.

(1) Pharmacotherapy side effects further reduced self-confidence and increased psychological burden. Patient I (58 years old) shared:

'I used to cook all the meals for my family, but now, due to impaired taste and smell, my husband has taken over. It saddens me to see him caring for me throughout the day—I feel like I have become a burden to my family.'

(2) Anxiety about social isolation and symptoms' visibility was also common. Patient N (67 years old) stated: 'I can't go to the cinema or restaurants anymore—I can only eat soft foods and always have acid reflux. Pain can be hidden, but coughing disturbs others... I don't want my symptoms to disturb people around me.'

(3) Altered self-image and role identity. Significant weight loss and changes in physical appearance led to profound feelings of inferiority. Patient D (56 years old) reported:

'Now I avoid going out, fear encountering old friends who might ask unwanted questions—especially fearful of their strange looks.'

(4) The shift from caregiver to care-receiver also challenged patients' self-identity and often induced depressive feelings. Patient I (58 years old), a former chef, lamented: 'I was a chef; making delicious food that delights others brought me great fulfillment. I enjoyed tasting gourmet food. Yet now, eating has become merely a chore for me, completely devoid of pleasure.'

Insufficient information and lacking support regarding chemoradiotherapy's side effects

(1) Insufficient understanding about chemotherapy-induced myelosuppression: 'My platelet count is too low to receive chemotherapy, delaying treatment by 2 weeks. I feel worse and want to quit–just remove my PICC line and take meds at home.' (Patient S, 69)

(2) Lack of awareness about radiation esophagitis: 'Initially had Level 4 esophageal pain when eating. After 7–8 radiotherapy sessions, it eased, so I thought I was recovering. But now at Session 16, the pain's worse than ever – I'm terrified to swallow and feel like I'm dying.' (Patient E, 68)

Pessimism

Patients adopted pessimistic habits in response to their symptoms, withdrawing from social activities, and abandoning hobbies and their social roles were changed.

(1) Social isolation: 'I can't go out now–constant nausea and vomiting mean that I can't leave the bathroom. It's too inconvenient in public, so I have nowhere to go but stay at home.'

(2) Losing hobbies and any interests: A formerly avid chess player reported he was completely disinterested because of fatigue, pain, and acid reflux. 'What hurts most is losing passion for fishing, which was my favorite outdoor activity. Yet the treatment was so exhausting I can't do fishing and just need rest.' (Patient E, 68)

(3) Role transition: Disease progression brings occupational changes. 'I've been transferred from management position to inspection duties – my health can't handle frontline work anymore.' (Patient R, 70)

Theme 3: Effective coping strategies in symptom management

Proactive approaches, including lifestyle adjustments, seeking social support, and maintaining optimism, can significantly alleviate symptoms. These methods enhance the patients' disease prevention capabilities, improve treatment quality, and boost self-efficacy.

Lifestyle choices

(1) A healthy and positive lifestyle can alleviate symptoms and enhance quality of life, cessation of harmful habits: 'I used to work overtime, and liked drinking too much alcohol and having junk food, but now I've quit drinking alcohol completely' (Patient P, 73); 'In the past, I was on regular smoking and often liked having a drink with friends, but since I received diagnosis I've quit both tobacco and alcohol' (Patient Q, 60).

(2) Dietary change: 'I never liked eating fruits before, but now I must follow doctor's advice to eat kiwifruit to help esophageal mucosa recovery and reduce eating pain' (Patient G, 43).

(3) Altered eating patterns: A former construction worker shared:

'At the worksite, I used to eat more, and I finished each meal very quickly, but now I must chew slowly and carefully' (Patient L, 66).

(4) Meal schedule adjustment: 'Previously my eating was on a regular schedule, now I consume more food in the day, eat less in the evening to prevent reflux and midnight heartburn' (Patient C, 64).

(5) Increased nutritional intake: 'Eating causes tremendous stress, but my strong will to survive forces myself to eat' (Patient O, 65).

Social support: effective social support enables patients to access more information and adopt positive attitudes and coping strategies

(1) Seeking help from clinicians: A patient from rural area with primary school education background affirmed the importance of guidance taught by healthcare workers: 'During hospitalization, I always ask about my test results. The doctors and nurses explain everything clearly, including bad news, and tell me what to do. I follow their instructions and ask whenever I'm unsure.' (Patient C, 64).

(2) Utilizing social media platforms: 'I often check the hospital's official mini-program and the 'Starfish Doctor' app, which provides useful treatment-related precautions.' (Patient P, 73).

(3) Exploring personalized symptom relief: 'For severe reflux, I found an anti-reflux pillow online that helps me a lot, but the reflux still occurs between midnight and 1 AM, I need to take Domperidone which relieves symptoms until morning.' (Patient R, 70).

(4) Engaging with patient organizations: 'My wife and I joined a cancer peer-support group. Their regular lectures taught me many coping strategies.' (Patient K, 51).

(5) Support from family and neighbors: 'My downstairs neighbor had the same illness two years ago. After learning about my diagnosis. They frequently visit me and share experiences–advising me on treatment precautions, like maintaining a bland diet and avoiding hard/sticky foods.' (Patient B, 74)

(6) Financial aid from insurance: 'Fortunately, my daughter purchased commercial insurance before I got sick. Now it reimburses our out-of-pocket expenses for tests and medications, significantly reducing financial pressure.' (Patient Q, 60)

Maintaining a positive attitude toward the treatment and life

(1) Some patients have high self-efficacy: 'My doctor told me it's not serious – just two chemotherapy cycles should alleviate symptoms. I'm confident.' (Patient P, 73)

(2) Another patient emphasized: 'I want others who got the same diseases like me to understand cancer is now manageable as a chronic condition. Most of us can live with it.' (Patient N, 67)

(3) A female patient shared her case: 'I previously received treatment and recovered well from a cerebral infarction here. I was even born in this hospital – the staff know me well. With advanced medical technology, I will overcome this disease too.' (Patient M, 78)

(4) A neoadjuvant chemotherapy patient reported: 'During chemoradiation treatment I had persistent hiccups. General drugs were not working, but a friend recommended a newly researched medication to me, I tried and it worked well for me.' (Patient R, 70)

Discussion

Multidimensional influences on symptom experience

The symptom experiences of esophageal cancer patients are shaped by physiological, psychological, and environmental factors, consistent with the TOUS framework.

Regarding physiological factors, the tumor's location—particularly cervical and upper thoracic esophageal cancers—was identified as a critical determinant of symptom clusters' severity. Patients with these tumor types reported exacerbated dysphagia, odynophagia, acid reflux, and heartburn. Those symptoms typically emerged in the second or the third week after the initiation of radiotherapy. These were accompanied by earlier and more severe nausea, vomiting, loss of appetite, and weight loss. The anatomical characteristics of these regions often make chemoradiotherapy the primary treatment option, which contributes to intense postprandial pain and swallowing difficulties. Subsequent dietary reductions further accelerate weight loss[18,19]. Additionally, radiation-induced esophagitis and pneumonitis progressively intensify the symptom burden, including reflux, cough, dyspnea, and nausea/vomiting. Meanwhile, patients with mid- to lower thoracic tumors developed moderate to severe reflux during the middle stage of treatment. It was associated with compromised anti-reflux mechanisms and the negative impact of intrathoracic pressure on the stomach[20,21].

The patients' reflux + cough symptom clusters were often compounded by anxiety. Psychologically, emotional distress was consistently reported as a prevalent symptom across all cancer types and stages[22]. Environmentally, symptom-related discomfort substantially impaired patients' functional capacity in social, familial, and occupational contexts—a pattern also observed in other gastrointestinal and lung malignancies[13].

Impact of symptom clusters on patients

Although it was based on the sample with 19 patients, this study identified core symptom clusters that align with the existing literature[2], including eating-related symptoms such as pain, loss of appetite, weight loss, anxiety, and profound grief; treatment-related toxicities, nausea, vomiting, pain, alopecia, constipation, xerostomia, fatigue, and dizziness; reflux + cough symptoms such as heartburn, dyspnea, and sleep disorders. These symptoms exerted substantial detrimental effects on physical functioning, social engagement, and overall quality of life[23,24].

Symptom management strategies and associated factors

This study revealed that certain patients actively engaged in lifestyle modifications—such as quitting harmful habits, adjusting diet and eating patterns, redistributing daily caloric intake, and enhancing nutritional consumption—in compliance with medical advice. Multichannel social support systems, including guidance from healthcare providers, digital health platforms, peer organizations, insurance support, and family involvement, also facilitated symptom management. These observations partially differ from those reported by He et al.[25], possibly because of evolving healthcare quality, improved patient education, and increased public health awareness. Some patients demonstrated resilience and positive coping strategies, which may be attributable to their middle to older age and associated life experience and self-efficacy. However, deficiencies in symptom self-management were also evident, including insufficient informational support, limited knowledge, and passive coping behaviors—consistent with findings among breast cancer patients receiving chemotherapy. The participants frequently adopted negative coping mechanisms when confronting treatment-related challenges such as dysphagia, reflux-induced cough, and other side effects, resulting in emotional distress, self-perceived burden, anxiety, shame, diminished self-esteem, and loss of identity. A prior survey[26] also indicated that limited symptom awareness and information access hindered effective self-management, with some patients feeling uncertain about how to seek help.

Notably, younger and more highly educated patients tended to employ more proactive strategies, such as lifestyle adaptation and active information-seeking. This underscores the need for healthcare providers to continuously monitor patients' treatment responses and daily lives, empathize with their psychological experiences, and understand their needs from their perspective, thereby raising awareness and activating intrinsic motivation. Furthermore, esophageal cancer patients undergoing radiotherapy experience both generic symptoms (e.g., fatigue and anxiety) and disease-specific symptoms (e.g., dysphagia and reflux). Thus, healthcare teams should strengthen symptom assessments during treatment and collaborate within multidisciplinary teams—including psychologists and rehabilitation therapists—to provide timely, tailored, and efficient interventions. It is essential that clinicians promptly identify core symptoms and their mechanisms, address barriers to symptom management, and encourage the patients' self-regulation and healthy behaviors. Wu Fulei[27] developed an early warning system and precision intervention protocol for symptom distress in breast cancer patients, which improved their symptom management outcomes. Whether similar clinical decision-support systems could benefit esophageal cancer patients warrants further investigation.

A novel finding of this study is that patients experiencing multiple symptoms still expressed a desire to find meaning in life. Future research should explore individual differences in symptom experiences and identify patients at a high risk of severe symptoms[28], ultimately supporting the implementation of personalized symptom management strategies.

Conclusions

This qualitative study on esophageal cancer patients experiencing multiple concurrent symptoms yields clinically relevant insights. Two main implications arise. First, the semi-structured interviews effectively captured patients' symptom experiences during chemoradiation, identified barriers to symptom management, and evaluated their current self-management practices. Second, there is a need to develop and test clinical decision-support systems grounded in the TOUS, facilitating personalized symptom self-management frameworks for clinical use.

Ethical statements

This study was approved by the Ethics Committee of the study institution (No. KY20190404-02). Written consent was obtained from all participants.

Author contributions

The authors confirm their contributions to the paper as follows: data curation, formal analysis, and software investigation: Chen J; conceptualization, methodology, supervision, and validation: Ren X. Both authors reviewed the results and approved the final version of the manuscript.

Data availability

All data generated or analyzed duringthis study are includedinthis published article.

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Conflict of interest

The authors declare that they have no conflict of interest.

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