

RESEARCH ARTICLE

The experience of dealing with defecation dysfunction by changing the eating behaviours of people with rectal cancer following sphincter-saving surgery: A qualitative study

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Abstract

Aim: To explore the experience of dealing with defecation dysfunction by changing the eating behaviours of people with rectal cancer following sphincter-saving surgery.

Design: The descriptive qualitative design was applied.

Methods: Individual semi-structured interviews were conducted with 36 purposively selected rectal cancer survivors who had experienced sphincter-saving surgery. All interviews were recorded and transcribed verbatim. The thematic analysis was used to structure the data analysis.

Results: Three major themes, namely “have motivations to change diet”; “need strategies to change diet” and “face barriers to change diet” were generated along with 12 subthemes. Overall, needing to change one's dietary behaviour is the most important theme in addressing defecation dysfunction in patients following sphincter-saving surgery. Future studies need to focus more on the specific relationship between different food types and the degree of defecation dysfunction. Systematic, scientific and continuous instructions on eating behaviour are in great need for patients after sphincter-saving surgery.

KEYWORDS

defecation dysfunction, dietary modification, nurses, nursing, qualitative, rectal cancer, sphincter-saving surgery

1 | INTRODUCTION

Colorectal cancer (CRC) is one of the most commonly diagnosed cancers worldwide (Bray et al., 2018; Denost et al., 2011). With the rapid development of social economics and obvious changes related to lifestyle and the ecological environment, both the number of diagnosed CRC patients and the number of person who die from colorectal cancer in China are becoming the largest in the world (Ferlay et al., 2015). According to global cancer statistics from 2018, more

than 1.8 million CRC patients emerged worldwide in 2018; of these CRC patients, those with rectal cancer accounted for nearly 40% and patients with middle-low rectal cancer accounted for 70% to 80% of all rectal cancer patients (Bray et al., 2018; Zheng et al., 2008; Zhou & Wang, 2009).

With the development of surgical technology for rectal cancer, traditional abdominal perineal resection (APR) has increasingly been used instead of low anterior resection (LAR), showing that sphincter-saving surgery has been selected as the first choice for patients

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with middle-low rectal cancer (Wang, 2009; Saito et al., 2011; Sauer et al., 2004). However, saving the sphincter does not mean retaining its previous function. It has been shown that different defecation dysfunctions occur following this surgery, such as different degrees of frequent defecation, urgent defecation, failing to discharge all the stool at one time, defecation strain, overnight defecating, stool incontinence and confusing defecation with urination. All these symptoms have been confirmed to exist in up to 90% of rectal cancer survivors after surgery and nearly 20%–50% of patients suffer from severe bowel symptoms (Juul et al., 2014; Ziv et al., 2013). Moreover, it has been reported that defecation dysfunction can last more than 15 years after surgery and is thus often confirmed to be a permanent phenomenon (Lai et al., 2013; Reinwalds et al., 2018). It has also been identified that defecation dysfunction has caused so much trouble in patients' daily lives that it directly affects patients' quality of life (Chen et al., 2015; Keane et al., 2017).

The treatment of defecation dysfunction mainly relies on the self-management of the patients themselves. Dietary factors play an irreplaceable role in controlling these bowel symptoms. Overall, evidence about bowel symptom management through dietary measures has been described in only a few studies and evidence in this area is especially scarce in China. Therefore, this study explored the experience of dealing with defecation dysfunction by changing the eating behaviours of rectal cancer patients after the sphincter-saving surgery. The results of this study have the potential to have an impact on nurses' practice of undertaking effective diet-related measures to manage defecation dysfunction.

2 | BACKGROUND

Although several factors have been confirmed to be connected with defecation dysfunction, such as the distance between the anastomosis and the anus, the age and sex of the patient, the type of surgery, the complications experienced after surgery, chemotherapy and radiotherapy, dietary factors have played an irreplaceable role in controlling these bowel symptoms because different ingredients in food could directly influence intestinal motility, moderate intestinal flora and change the form and component of the stool, all of which may result in changes in the frequency and feeling of defecation. Diet management has become an important self-managing strategy for controlling defecation dysfunction (Staller et al., 2018).

Nikoletti found that among a total of 101 patients, a close relationship between choice of food and bowel symptoms was confirmed by 30.7% of the patients and the patients thus wanted to control their symptoms by moderating their diets (Nikoletti et al., 2008). A qualitative study conducted by Landers and colleagues, using semi-structured interviews, found that among 143 patients, some thought sweet foods, such as chocolate cake, may aggravate the diarrhoea. (Landers et al., 2012). Thirteen focus-group interviews with 63 patients were conducted after sphincter-saving surgery, aiming to identify useful methods for controlling bowel symptoms. The foods mentioned in the interviews as having an adverse impact on

defecation included spicy foods, high-fat foods and dairy products. In addition, foods mentioned as needing to be avoided were cereals, beans, nuts, popcorns, lettuces and onions and foods pointed out as being good for defecation were liquid foods (except for soft drinks) and high-fibre foods (Sun et al., 2015).

Although the relationships between some specific foods and defecation were not the same among the different studies, fibre was reported by many studies to play an important role in controlling bowel symptoms, especially for controlling faecal incontinence (Hansen et al., 2006). A study conducted by McGough found that insoluble fibre, which exists in cereals, nuts, fruits, vegetables and whole-wheat bread, may increase the movement of the bowels and suggested that these foods should be avoided to slow down the transportation of food in the bowel, by which symptoms such as diarrhoea, frequent and urgent defecation could be relieved (McGough et al., 2004).

Many studies have shown that dietary modulation has been consistently thought of as important for controlling bowel symptoms. Trying to identify dietary triggers is one of the earliest self-care strategies used to improve their bowel function, as noted in a review. Meanwhile, this review also found that many individuals become overly cautious about their diet and restrict many more food groups than needed (Taylor & Bradshaw, 2015). Based on the focus-group study conducted by Sun, diet-related adjustment is the most common behaviour moderation, which includes not eating too much for every meal, reducing the number of meal times, chewing slowly and planning one's diet according to social activities (Sun et al., 2015).

Some limited studies have only reported the status of moderating one's diet, while the most scientific method used to moderate the diet is still not clear. (Desnoo and Faithfull, 2006; Nikoletti et al., 2008; Sun et al., 2015; Taylor & Bradshaw, 2015). In these studies, "trial and error" is reflected as a diet-moderating method, showing that controlling defecation dysfunction relies more on the self-management of the patients themselves than on scientific instructions. The lack of scientific instructions has also been reflected as a noticeable problem during diet management, as reported in studies conducted by Hansen and colleagues and Bours and colleagues, which brings about more difficulties for patients regarding changing their eating behaviours. (Bours et al., 2015; Hansen et al., 2006). Among 1,458 patients, only 17% were given dietary instructions which were of a varying nature, as reported in Bours' study. (Bours et al., 2015).

The importance of diet and nutrition during the recovery process has been widely recognized. Studies related to the diet and nutrition of rectal cancer patients after sphincter-saving operations mostly focus on the relationship between diet and disease outcomes. The exploration of the experience of changing one's diet has found that diet change strategies among different patients are variable and that the amount of time that patients spend identifying the most suitable dietary pattern for themselves is not consistent. Moreover, many patients could not identify the most suitable dietary pattern. The aim of this qualitative investigation is to explore the experience of dealing with defecation dysfunction by changing the eating

behaviours of patients after sphincter-saving surgery to identify the factors influencing their diet changes and controlling their defecation dysfunction. The study sought to answer two main questions: what is the experience of changing one's eating behaviours for the purpose of dealing with defecation dysfunction and what are the factors influencing one's diet changes and the control of defecation dysfunction?

3 | THE STUDY

3.1 | Design

A descriptive qualitative design was employed. Semi-structured face-to-face interviews were used to gain insight into the participants' personal experiences of dealing with defecation dysfunction by changing their eating behaviours.

3.2 | Methods

3.2.1 | Participants and recruitment

Participants were eligible if, at the time of recruitment, they were between 2 months and 2 years after having sphincter-saving surgery, they did not have any hearing or cognitive disorders and they were able to consent for themselves; in addition, the distance between their anal margin and the lower margin of their tumour needed to be from 2–20 cm. Participants were excluded if they had suffered from complications (anastomotic fistula, rectovaginal fistula, etc.) after surgery; if they had suffered from some intestinal problems, such as inflammatory bowel disease and irritable bowel syndrome; or if they had some hearing or cognitive disorders.

Purposive sampling was used to ensure the maximal variation in sex, age and operation type. Recruitment continued until it was considered that data saturation had been reached when no more new information or themes emerged from interviews (Sandelowski, 1995). Eligible participants were contacted either face-to-face or by telephone by one of the investigators to explain the purpose of the study. They were informed that they could refuse or withdraw at any time, and informed consent was signed before the formal interviews. The participants are identified in the data extracts below by alphanumeric code, where C = Participant. The participants' demographic and clinical data are presented in Table 1.

3.2.2 | Data collection

Semi-structured interviews were conducted among all the participants by two interviewers during March and June 2019. Both interviewers were registered nurses who had been given interviewing technique training before the interviews.

TABLE 1 Demographic and treatment characteristics of participants

Characteristics	n	%
Age(years)		
≤50	4	11.1
51–60	14	38.9
61–69	12	33.3
≥70	6	16.7
Gender		
Male	23	63.9
Female	13	36.1
Marital status		
Married	22	61.1
Divorced	10	27.8
Widower	4	11.1
Time from surgery to interview(months)		
0–3	6	16.7
3–6	9	25
6–9	11	30.6
12–24	10	27.8
Operation methods		
Robotic anterior resection of rectal cancer	28	77.8
3D laparoscopic assisted anterior rectal resection	8	2.2
Distance between the anal margin and the lower margin of tumour(cm)		
2–5	6	16.7
5–10	19	52.8
10–20	11	30.5
Neoadjuvant treatment(more than one method is possible)		
6 months intravenous chemotherapy	25	69.4
6 months oral medicine chemotherapy	11	30.6
Radiotherapy after surgery	17	47.2

The interview guide was developed under the guide of “system management theory (SMT),” including three elements connected with each other, namely, system experiences, system management strategy and effect of management. The first draft of the guide was initially discussed among the support group, which included clinicians and qualitative researchers. Some minor revisions to the interviewing content was made to form the final interview guide (Table 2). Interviews were conducted between one and three times for each participant, lasting 30 to 60 min each time.

All the interviews were conducted either in a quiet meeting room within the surgical ward or at the participants' home, according to their preference. During the interviews, the participants were encouraged to speak openly about their views regarding their dietary issues. The gestures made during the interviews were written down by the interviewer. All the interviews were audio recorded and transcribed verbatim by the interviewer within 24 hr of the conclusion

TABLE 2 Interview guide

Interview guide
1. Is there any defecation dysfunction existing after surgery?
2. What are these bowel systems? How these symptoms influence on your daily life?
3. Are there any relationships between the dietary factors and the symptoms of defecation dysfunction? What are the specific relationships between them?
4. Have you tried to change your dietary behaviors in order to deal with the defecation dysfunction?
5. How do you manage your dietary behaviors and what's the result of the management?
6. what are the factors influencing the process of changing dietary behaviors and could you describe it in detail?
7. Who do you want most to help you change your dietary behaviors and to give you suggestions about managing bowel symptoms?

of each interview. The demographic information and the diet-related data of the participants were collected before the interview, according to their medical records.

3.2.3 | Data analysis

Data collection and analysis occurred simultaneously. The data analysis process was based on the phrases of thematic analysis outlined by Braun and Clarke (2006). Interview transcripts were imported into NVivo (version 11) to facilitate data coding. A unique anonymous number was allocated to individual participants' audio recordings and electronic files.

The steps of analysis included the following: (a) the transcripts from all the interviews were read several times by the lead investigator for general understanding and immersion in the data; (b) meaning units (sentences or paragraphs) corresponding to the participants' experiences of changing their diet after surgery were selected using an inductive approach; (c) codes were developed based on the transcripts; (d) the codes were first grouped into subthemes based on their similarities and differences; and (e) the subthemes were abstracted into themes. An electronic audit trail was reviewed by a second investigator to check if there were any discrepancies about the codes or themes between the two researchers; if there were discrepancies, the two researchers discussed them with each other until a consensus was reached.

3.2.4 | Ethical considerations

Ethical approval for the study was granted by the Institutional Review Boards of Fudan University, School of Nursing (#TYSQ2019-6-01).

3.2.5 | Rigour

The rigour of this study was achieved in the following ways:

- First, all the interviews were conducted under a relaxed environment. The experiences of the participants were appraised in a neutral and uncritical manner by the interviewer.

- Second, after the interview, the researcher immediately called back a participant if some uncertainty was found in his or her interview data to ensure that the information of each participant was correctly integrated.
- Third, the forming of categories, especially any discrepancy between them, was discussed among the authors until a consensus was reached.
- Fourth, the consistent rereading of the transcripts and the use of reflection memos accompanied the data analysis.

4 | RESULTS

Thirty-six patients diagnosed with rectal cancer after sphincter-saving surgery participated in this study. Three major themes along with 12 associated subthemes emerged from the data, which are described in detail in Table 3. Selected direct quotes from the participants are presented with the participants' identifiers for the purpose of illustrating certain subthemes.

TABLE 3 The themes and subthemes generated from the results

Themes	Subthemes
Have the motivation to Change diet	Physical burden driven
	Social activity driven
Need strategies to change diet	Trial-and-error approach
	Challenging past dietary habits
	Coordination between diet and other social activities
	Passive adaption based on the relationship between diet and defecation dysfunction
Face barriers to changing diet	Information support acquirement
	Confliction with nutrition requirements
	Conflicting information from different channels
	The influence of the external environment
	Lack of self-control
	Excessive restriction of foods

4.1 | Have motivations to change diet

Nearly all the participants have tried to change their dietary behaviours to control their defecation dysfunction. Most of them aimed to relieve the physical symptoms caused by abnormal defecation, while the other ones aimed to resume their normal social activities.

4.1.1 | Physical burden driven

Different types of defecation dysfunction emerged after sphincter-saving surgery, especially during the first 6 months. Some participants experienced unbearable bowel symptoms immediately after the surgery, prompting them to try their best to find solutions aimed at relieving or controlling their defecation dysfunction. Foods were pointed out to be possible influencing factors of defecation by many participants. Thus, the first method thought of by participants was that of moderating their eating behaviours: "The defecating process was so torturous and unbearable, my anus was always experiencing intense pain. So, I was always trying different foods to facilitate the formation of stool. I have tried bananas, many more starches and whole grains, hoping to find a way to make defecation smooth."(C22).

Some specific foods were found to aggravate bowel symptoms during the recovery process after sphincter-saving surgery. Once the participants realized this relation between foods and defecation dysfunction, they preferred to avoid these foods. For example, one participant reported: "Fried foods should be avoided for me. Once I eat them, I have loose bowels and the diarrhea could happen to me immediately; so I refuse every fried food." (C32).

The more severe the bowel symptoms suffered by the participants were, the more urgently they tried to change their diet habits, especially during the first 6 months after surgery.

4.1.2 | Social activity driven

The second obvious influence on daily life caused by defecation dysfunction was that of disrupted social activities. As time went by after the sphincter-saving surgery, the need for patients to return to their normal social activities became greater, including starting to work again, going for re-examination at the hospital, performing simple daily exercises and joining some necessary meetings with friends or workmates. Considering the possible relationship between eating and bowel symptoms, some participants were forced to moderate their dietary behaviours in case their bowel symptoms interrupted these activities. They chose to avoid the potential embarrassment and discomfort caused by defecation dysfunction during social activities.

For example, a participant reflected that: "I need to defecate several times after I eat a meal. So, if I know I need to be out of the home for a long time, I may eat less for one meal or even give up a meal... just like today, I have to spend the whole afternoon at hospital for examination, so I just ate a little at lunch and now I do not feel that I have to defecate."(C34).

4.2 | Need strategies to change diet

The participants discussed different methods to address defecation dysfunction, including by changing their dietary behaviours with the help of medical instructors, their living and working environments and the patients themselves.

4.2.1 | Trial-and-error approach

Consistent trial and error was reflected on by several participants, aiming at finding out the foods that have an impact on bowel symptoms and avoiding the foods that aggravate defecation dysfunction. For example, one participant said: "I have tried several times to determine that watermelon may increase the frequency of defecation once I eat it. I had to decrease the amount of watermelon that I eat."(C14).

Greasy foods and high-fibre foods were the most often mentioned food types that have effects on defecation, including fried food, braised pork and fish, sweet potatoes, vegetables, fruits and so on. One patient stated that: "corn was determined to be good for my defecation; once I ate corn, my stool seemed to be more likely to take shape."(C7) Trial and error seemed to be the most effective method by which participants can control by themselves.

4.2.2 | Challenging past dietary habits

Being forced to change one's dietary behaviour may force one to break previous dietary habits. To control their bowel symptoms, some participants successfully changed their past dietary habits: "The doctor told me to eat more vegetables and high-fiber foods to make my stool more formed, so I eat two plates of vegetables everyday now. I pay much attention to foods now, compared to my past life before the surgery; the alternation was so huge that I look like another person now." (C19).

Some of the participants changed their past habits only slightly for several reasons, such as the time since surgery growing longer and the participants attaching less importance to food. Another reason was that their long-term formed personal eating habits were unbreakable. For example, one participant reflected that: "They said that corn and sweet potatoes were good for my defecation and I tried to eat some at the beginning of chemotherapy, but I no longer eat them now because I never got used to eating them."(C34).

4.2.3 | Coordination between eating behaviour and other social activities

Some participants reflected that their defecation is directly related to their eating behaviours. One participant said: "Once I eat a meal, no matter whether breakfast, lunch or dinner, I have to defecate

sometime around 30 min after the meal.”(C17) These participants choose to eat less at meals in case they must defecate too many times during subsequent social activities.

Several participants referred to too much flatus existing in their lives after surgery, making them feel embarrassed when they are together with friends and workmates. As a result, they avoid foods that have the possibility of inducing too much flatus to guarantee normal social activities. For example, one participant said: “If people around me smell the stink, that would be too embarrassing. I always avoid sweet potatoes and soybean milk, which usually cause too much flatus.”(C19) Some participants reported limiting their mealtimes at restaurants, just because they prefer to avoid any possible unnecessary embarrassment caused by defecation dysfunction.

4.2.4 | Passive adaption based on the relationship between diet and defecation

Some participants reported trying to alternate their eating habits according to newly emerging defecation habits. For example, a participant reported that: “Right after taking a meal, I have the urgent feeling to defecate and sometimes even when I am halfway through my meal; especially when I eat some soup, I need to go to the toilet. So, I formed the habit of defecating just before a meal to limit the disruption of the meal by defecation and I avoid eating too much soup.”(C24).

Some specific foods were found to be related to defecation dysfunction. One participant said: “When I eat watermelon, I have to defecate more often the following day and the stool is not formed enough. This never happened in my past life. So, I have to forbid watermelon in my life now.” (C5).

The time at which and the amount of food that one eats has also been moderated by several participants to prevent defecation overnight: “To prevent defecation during the times at which I am asleep, I have decreased the amount of foods taken at dinner and I try to avoid eating food after 9 Pm.”(C21).

4.2.5 | Information support acquirement

Since most participants reported not being sure which kind of diet was the most suitable for them, they chose to obtain instructions from medical staff. For example, one participant said: “I asked the doctors how to eat both in the ward right after surgery and at the clinic and I just follow as their guides now.”(C11).

Traditional Chinese medicine was identified as another channel of medical instruction, which is a characteristic and common method in China. Several participants obtained dietary instructions according to the theory of traditional Chinese medicine. For example, one participant said: “I found help from traditional medicine about how to relieve my constipation after surgery. The doctor prescribed a Chinese medicine for me and gave me some dietary suggestions; later, it seemed that the constipation was relieved a little, but

I was not sure whether it was because of the Chinese medicine's effects.”(C27).

Some participants tried to find out on the internet what to eat to solve their defecation problems. One participant said: “The defecation was so unbearable that I searched the internet to learn how to eat; vegetables were suggested to be good for resuming normal defecation and they should be eaten more often.” (C11).

Several participants reflected that other patients' experiences also provided some information about strategies to control their own defecation dysfunction. For example, one participant said: “When I came back to the hospital for re-examination, I met some other patients and they shared their experiences of eating with me; some of them said the Chinese yam could make defecation smoother and another patient said that fried foods would make the diarrhea more severe.” (C8).

4.3 | Face barriers to changing diet

During the process of overcoming defecation dysfunction, some objective or subjective difficulties may appear and cause barriers to dietary management.

4.3.1 | Confliction with nutrition requirements

Some methods used to relieve defecation dysfunction, such as decreasing the total amount of food at every meal and avoiding greasy foods and meat in one's diet, are also considered by doctors to affect the nutrition supply of patients. Some of the participants reflected that they preferred to first satisfy their nutrition supply and ignored the effects on defecation caused by foods. For example, one participant reported: “Although food rich in protein, such as eel and loach, make the defecation more frequent, I still eat them as the doctor suggests for absorbing enough nutrition during chemotherapy.”(C35).

Meanwhile, some other participants felt that their defecation dysfunction was so unbearable that they could not bear it anymore. Therefore, they would rather sacrifice their nutrition supply to make themselves feel better: “My anus was always so painful that I couldn't stand it anymore. I told the doctor that once the chemotherapy was over, I wouldn't eat so many nutritious foods.”(C13).

4.3.2 | Conflicting information from different channels

Information about diets gained from different channels do not always reach an agreement, making the participants feel confused about their dietary changes. Even for the same kind of food, such as bean products and high-fibre foods, the instructions can be contradictory. For example, one participant reported: “Eating

more foods high in fiber was suggested by my doctor, so I tried Chinese chives and my defecation was more normal after I took them. However, some wardmates have said that Chinese chives are thought to be stimulating foods in traditional Chinese medicine that may have negative effects on tumors. So, can I go on taking it in the future?" (C29) Based on the interviews, obtained dietary information was scattered and inconsistent for almost all the participants.

4.3.3 | The influence of the external environment

One's living environment and cooking habits are also considered to be influencing factors from the external environment. Some of these factors may cause difficulties in changing one's eating behaviours. For example, one participant reflected: "I was eating meals at my relative's house with many people together and my relative was preparing many dishes that including too much meat. I couldn't criticize her because she cooked for us out of kindness, but I didn't mean to eat so much greasy food in case it caused too much defecation."(C24).

Not only meals eaten at home may have effects on the participants' diet but also meals eaten outside together with workmates may bring about some trouble for participants. For example, one participant said: "Some workmates always treat me for dinner just for business and they order hearty dishes, including meat, fish, fried food and so on. Although I told myself I should eat less foods like these, sometimes I still eat a little of one dish and then a little of another dish... and by the end, I have eaten too much. I found that after I go out for a meal, my defecation frequency increases a lot in the following day."(C16).

4.3.4 | Lack of self-control

In addition to the external environment, internal factors play an important role in changing one's diet, especially self-control, which obviously affects one's dietary behaviours. For example, a participant reported: "I thought of the possibility of diarrhea after eating greasy foods, but I just couldn't help eating some foods like nuts and fish in brown sauce; it was just the eye-hunger."(C13).

Several participants reflected that eating vegetables and fruits was suggested by doctors after surgery. Lacking self-control was the reason why they gave up on this suggestion: "I really don't like fruit; I tried my best to eat some at the beginning, then I failed to keep it up."(C26).

4.3.5 | Excessive restrictions of foods

Some participants reported that even if they were not sure that some foods definitely caused abnormal defecation, they just took action in advance out of a sense of fear. For example, one participant said: "I

dared not to drink milk or soybean milk because of the possibility of causing bad effects on my defecation; I thought they might cause bowel movements more frequently, that was just my guess."(C33) Another participant said: " I wondered if I could eat bananas after surgery, I really didn't know; the bowel symptoms were so severe that I really dared not to eat many foods after the surgery."(C12).

For the participants who were within the first 6 months after their surgery and who were experiencing the most severe defecation dysfunction, the self-restrictions of their daily diets were especially obvious, although some of them were unnecessary. For example, one participant reported: "The more foods I ate, the more times I had to go to the toilet, so I tried to eat less; I even tried to drink the least of amount of water possible." (C24) Some of the changes to dietary behaviours made by participants themselves were considered excessive restrictions.

5 | DISCUSSION

The present study deeply explored the experience of dealing with defecation dysfunction by changing one's eating behaviours among rectal cancer patients after sphincter-saving surgery. The findings highlight the necessity for intervention strategies to improve dietary and nutritional care among these patients on the basis of their needs and expectations.

Compared with other cancer patients, controlling one's bowel symptoms was a special motivation to change one's diet for rectal cancer patients after sphincter-saving surgery. The close link between dietary behaviour and defecation dysfunction emerged in the present study, which is in accordance with the findings of previous studies (Bours et al., 2015; Nikoletti et al., 2008). However, the results seem to be confusing because the individual variation regarding the effect of some specific foods on bowel symptoms is obvious. Some fruits, such as bananas, were reported as making defecation smoother, while some other fruits, such as watermelons, were pointed out as causing defecation more frequently in this study. The same condition also existed in the effect of the corn on defecation. In some previous studies, foods rich in fibre have been reported to be good for defecation, especially for continence management (Colavita & Andy, 2016). This inconsistency may be due to the focus of these past studies being on the total quantity of fibre in the diet, while the participants in our study were concerned with specific high-fibre foods. This highlights the importance of future studies looking longitudinally at how specific food ingredients influence defecation dysfunction.

Self-management was the main method used by patients to control their defecation dysfunction in this study. Excessive modification was an obvious problem presented in this study, which has also been referred to in another study. Claire Taylor pointed out that some of the self-restraint of some foods by patients is not necessary because there are only at most two specific foods that have the chance of aggravating one's bowel symptoms (Taylor & Bradshaw, 2015). Overcontrol may add evidence to the lack of medical instructions on dietary choices for

patients. From the results of another qualitative study conducted by Bours and colleagues, only 17% of colorectal cancer patients receive dietary instructions after surgery and patients refer to nurses as the most suitable people to provide them with dietary information support and instruction (Bours et al., 2015). As the trial-and-error method is a common self-care strategy used by patients to manage defecation, it seems that defecation management relies more on patients' experiences than on scientific instructions. These findings stress the need to undertake more research on identifying effective interventions for dietary instruction, which would also be good for enhancing patients' sense of control over their own recovery.

The uncertainty about changing one's diet was mainly caused by the conflict of different requirements of the patients, including relieving defecation dysfunction, satisfying their nutrition supply and reducing the chemotherapy response. It is confusing for patients to decide the priority of these different requirements and sometimes their resulting diet modifications are either excessive or casual, thereby leading to non-effective modification and even causing malnutrition status. Nutrition was confirmed to play an important role in cancer patients' prognosis (Colavita & Andy, 2016; Winkels et al., 2014). Malnutrition could be caused by unscientific dietary modification, which has been reported by another study where the result of the individual dietary management of patients with faecal incontinence was unbalanced dietary patterns, malnutrition and hypo-immunity (Hansen et al., 2006). Based on these findings, the issue of how to provide scientific instructions aiming at both relieving the physical burden and providing enough nutrition is an important problem for medical staff.

The confusion and difficulty related to dietary changes experienced by the participants also reportedly caused psychological and social burdens in their lives. Some patients felt depression about passively changing their diet and losing quality of life, while other patients experienced family conflicts because of different views about foods, thereby making the patients feel stress from family members. Some patients reported that they felt guilty and like an inconvenience when joining in social activities with friends and workmates because doing so would inevitably interrupt their eating behaviours. These are all things that aggravate the psychological burden to some degree. Helping family members understand more about patients' requirements and learn more scientific knowledge about their diets may lessen the divergence among family members. This highlights the importance of receiving support and assistance from community medical staff. Continuous dietary instructions from tertiary hospitals to community hospitals are greatly needed to facilitate the smooth transition of changing eating behaviours aimed at controlling defecation dysfunction and further relieving the psychosocial burden of such dietary changes.

6 | LIMITATIONS

Several limitations of this study have been identified. First, although we contacted all the participants who met the enrolment criteria, it

seemed that the participants with more severe symptoms and those who paid more attention to their symptoms and recovery were more likely to agree to the interviews. Those who refused to be interviewed seemed to do so either because of the distance between their home and the hospital or because they were more ignorant about their own bowel symptoms. Second, although we intended to enrol a wide variety of patients, the portion of participants over 80 years old was small, which might lower the representativeness of our participants. In the future, we need to enrol participants from more hospitals and different areas to further enhance the diversity of the participants.

7 | CONCLUSIONS

The confusions, confictions and barriers related to changing eating behaviours presented in this study have highlighted the fact that healthcare practitioners and organizations need to provide systematic, scientific and continuous support and instructions for diet and nutrition so that patients can effectively deal with defecation dysfunction after sphincter-saving surgery. Based on the trial-and-error process of managing defecation dysfunction, future studies could target the specific relationship between certain foods and defecation dysfunction and suggest suitable forms and methods of dietary intervention to make successful dietary changes that meet both the physical and psychological needs of patients.

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CONFLICT OF INTEREST

The author declares no conflicts of interest.

AUTHOR CONTRIBUTION

Hai Ou XIA was responsible for the organization of the manuscript and the study design. Wen LIU was responsible for the majority of the draft writing. Jian Min XU and Yu Xia Zhang contributed the data collection and data analysis in this manuscript. Hui Juan LU was responsible for the study conception and made critical modification and revisions for the draft.

TRANSPARENCY DECLARATION

The lead author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported. The reporting of this work is compliant with COREQ guidelines. The lead author affirms that no important aspects of the study have been omitted and that any discrepancies from the study as planned and the study was approved by the Ethics Committee of School of Nursing of Fudan University.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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