# Coping With First-Time Endoscopy for a Select Sample of Chinese Patients With Functional Dyspepsia and Duodenal Ulcer: An Observational Study

Cecilia Cheng, PhD, Wai-mo Hui, MD, and Shiu-kum Lam, MD

**Objective:** This study examined how patients with functional dyspepsia (FD) and duodenal ulcer (DU) coped with first-time endoscopy, a highly relevant real-life stressor. We adopted an observational method to enhance the ecological validity of the study on stress and coping. **Methods:** A matched case-control design was adopted to compare differences between 30 Chinese FD patients from a select sample and 30 Chinese DU patients (13 females and 17 males in each group) in observed coping behaviors, mood states, and subjective appraisals of endoscopy. A new observation checklist was developed for recording subjects' coping behaviors, and our validation study showed that this newly developed measure had adequate reliability and criterion-related validity. **Results:** Compared with their DU counterparts, FD subjects 1) used more problem-focused coping, 2) used less emotion-focused coping, and 3) sought more instrumental support. They also had higher levels of anxious mood both before and after the endoscopy than did DU subjects. Moreover, compared with DU subjects, FD subjects reported having more pains and discomfort during the endoscopy and more dissatisfaction with the endoscopy. **Conclusions:** Using an objective observational method in a select sample of FD patients, the present study provided tentative evidence that FD subjects tend to adopt an action-oriented coping pattern when encountering first-time endoscopy. **Key words:** functional dyspepsia, duodenal ulcer, psychological factors, stress, coping, endoscopy.

DU = duodenal ulcer; EAS = Endoscopy Appraisals Scale; FD = functional dyspepsia; GI = gastrointestinal; MAACL-R = Multiple Affect Adjective Checklist– Revised; MANOVA = multivariate analysis of variance; SES = socioeconomic status.

### **INTRODUCTION**

Functional dyspepsia, the most prevalent functional GI disorder (1), is characterized by chronic or recurrent abdominal discomfort lasting for at least 3 months (1, 2). Functional GI disorders differ from GI disorders such as DU in that no physical causes have been identified (3, 4). Because there is no clear organic pathologic abnormality identified for FD, stress has been proposed to be a major psychological factor influencing FD symptoms (1). A myriad of previous studies have examined the role of stress in FD. Most studies (5-9) revealed that FD patients did not experience more stressful events than did DU patients or healthy individuals. Other studies (5, 10-12) examined perceived qualities of stressful events. Findings showed that FD patients appraised the experienced stressful events to be more severe, threatening, and prolonged than did subjects from the control groups.

Address reprint requests to: Cecilia Cheng, PhD, Division of Social Science, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong. Email: c.cheng@ust.hk

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A critical review of this body of research revealed that psychological factors play an important role in functional dyspepsia, but three gaps remain to be filled in this growing literature. First, most studies, with a few exceptions (13, 14), ignore interacting agents that may play an influential role in psychological vulnerability to stressful events. It is not the external stressful event but the individual's ability to adapt to a stressful event that determines emotional and physiological responses to it (15). Even when experiencing the same stressful event, individuals may differ considerably in their responses to stress. The construct of coping is proposed to be an important interacting agent that moderates the impact of stress and influences individuals' psychological well-being and quality of life (16-19). Coping refers to the utilization of resources as an attempt to reduce, avoid, or eliminate the aversive effects of stress (20, 21). Individuals who use effective coping behaviors to handle stressful events experience higher levels of physical and psychological well-being, whereas those who use ineffective coping behaviors experience poorer physical and mental health (22, 23).

Second, although the health-protective role of the social environment has been well discussed in the past decades (24–27), no studies so far have examined the influence of social relations on FD patients. The provision of support from others has consistently been shown to mitigate anxious and distressed feelings in times of stress (28, 29), and the beneficial role of social support on health maintenance has been shown in a myriad of illnesses, such as coronary heart disease (30, 31), diabetes mellitus (32), human immunodeficiency virus infection (33), and hypertension (34). Because anxiety is the major complaint of FD patients (35), it is likely that the beneficial role of social support may be extended to FD.

Third, most studies adopted a self-report approach

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From the Division of Social Science, Hong Kong University of Science and Technology (C.C.), Hong Kong; University Department of Medicine, University of Hong Kong (W.H., S.L.), Hong Kong.

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to stress and coping. The self-report method is susceptible to several problems. Because FD patients were found to be hypersensitive to danger cues and to monitor these cues closely (14, 36), their perceptions of stressors may simply reflect their monitoring perceptual style rather than their actual stressful experiences. Because FD patients were consistently found to be more anxious and distressed that their DU and healthy counterparts (35, 37-42), they may attribute their anxiety and distress to recent stressful events even if these events are just coincidental with their heightened levels of anxiety and distress (43, 44). The impact of stressful events on FD patients may thus be overestimated. In previous studies, FD patients were asked to recall the experienced stressful events within a period ranging from 4 months to 1 year; however, individuals' recall of their stressful experiences and coping responses over this relatively long period is not always reliable (45, 46). Subjective recall is also susceptible to distortions and biases from "meaning after effort." That is, the more negative perception of stressful events may reflect FD patients' ineffective coping style, which results in more undesirable coping outcomes. The results may thus reveal the outcomes of their coping efforts rather than provide an accurate account of their stressful experiences.

# Aims of Study

The present study was conducted to address all these unexplored issues, thus extending the existing body of FD research in three ways. First, this study examined how FD and DU patients cope with a highly relevant real-life stressor, undergoing an endoscopic examination for the first time. A sample of FD patients was selected to match the demographic characteristics of DU patients to make such a comparison. Endoscopy involves the insertion of an illuminated optical gastroscope into the alimentary tract to examine the interior of the esophagus, stomach, and duodenum. Direct insertion of an invasive instrument is a stressful experience and has been commonly regarded as a stressful event in the hospital setting (47). This procedure is especially stressful for a person who has not undergone endoscopy before, because the "fear of the unknown" (48) may further magnify the anxiety levels elicited by the procedure. Patients with upper GI symptoms, such as epigastric pain and distention, are often required to undergo endoscopy for a diagnosis. Thus, this real-life stressor is particularly relevant to patients with FD (a functional GI disorder) and DU (an organic GI disorder). An analysis of individuals handling a highly relevant real-life stressful situation may

enhance the ecological validity of research on stress and coping.

Second, this study expanded the current scope of coping by incorporating social support as a psychosocial coping resource. The literature on coping (19, 49) identifies two broad types of coping strategies, namely problem-focused coping and emotion-focused coping. Problem-focused coping refers to individuals' efforts to change and control the problem, whereas emotionfocused coping refers to individuals' attempts to alleviate the negative emotions elicited by stressful events. In this study we examined two additional types of social coping, namely instrumental support and socioemotional support. Instrumental support refers to individuals' attempts to seek tangible aids and informafrom others to handle stress, whereas tion socioemotional support refers to individuals' attempts to seek reassurance and companionship from others in times of stress. Examining these four types of coping may provide a more comprehensive assessment of coping.

Third, our study used an observational method to study the coping behaviors of patients with FD and those with DU. The self-report approach has been criticized for its susceptibility to possible bias from social desirability and demand characteristics (50, 51). The observational method is proposed as an alternative to the self-report approach because data collection does not rely on subjects' recall of what they experienced and how they coped, thus minimizing the problem of bias from the subjects. In this study, two independent observers recorded the observational data. Moreover, a checklist was developed on the basis of a 6-month pilot observational study in which the coping strategies actually used by patients while waiting to undergo endoscopy were examined. These coping behaviors were then combined to compile the items of the observation checklist.

# METHODS

# Subjects

A total of 214 Hong Kong adults (113 females and 101 males) participated in this study. All subjects were ethnically Chinese. This sample comprised two groups. The first group comprised consecutive DU patients undergoing endoscopy. The second group comprised FD patients undergoing endoscopy, matched for sex, age, and SES. SES was based on occupation and annual income. Patients with endoscopic evidence of DU disease constituted the DU group. Those with dyspeptic symptoms (eg, epigastric pain and belching) for at least 3 months within 1 year but without endoscopic evidence of peptic ulcer disease, gastric cancer, gastritis, or esophagitis constituted the FD group (2).

Subjects were recruited from the gastroenterology section of a public hospital in Hong Kong. Patients were approached by a research assistant and were invited to participate in this study if they

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had not previously undergone endoscopy. To ensure a uniform baseline of social support for all subjects at the outset of the study, only those who were not accompanied by any relatives or friends were recruited. Patients were excluded if they had symptoms of irritable bowel syndrome, suffered from heartburn or acid regurgitation, had undergone a surgery before, had a history of serious physical or psychiatric illness, were pregnant, were under 18 years old, or were unwilling to give informed consent. Of the patients who met the selection criteria, 84% of the DU group and 87% of the FD group agreed to participate in the study. These patients were then observed, and data were recorded by the observers.

Patients were diagnosed on the basis of their endoscopic results. Because DU is less prevalent than FD by a ratio of 1:5, 30 consecutive subjects having an endoscopic diagnosis of DU (see "Measures") were included as target subjects for matching. Then a research assistant who did not participate in the observation went through a list of patients having an endoscopic diagnosis of FD (see "Measures"). The first 30 FD patients whose demographic characteristics (ie, sex, age, and SES) matched those of the target DU subjects were included. The patients were first matched for sex, then SES, and then age. One hundred eleven FD patients were excluded, 19 because of poor sex matching, 6 because of poor SES matching, and 86 because of poor age matching. This group of excluded patients on average was younger (mean age = 43.56 years, SD = 9.32, range = 21-69) than the target group of FD subjects. Moreover, data for 43 subjects who were diagnosed as having GI problems such as mild gastritis and esophagitis were excluded.

The final sample comprised 60 subjects, 30 subjects (13 females and 17 males) in each group. A sample of 30 yields a power of 0.90 for a large effect size (52). The average age in each group was 52.03 years (SD = 10.31, range = 39-78 years). The demographic characteristics of the DU group were similar to those of DU patients as reported in a large-scale Hong Kong study (53), thus indicating that this group was representative of DU patients in general. However, the demographic characteristics of the FD group differed from those of FD patients as reported in previous Hong Kong studies (13, 14, 54, 55). Compared with the samples of these studies, the present group of FD subjects had a greater proportion of males and was older.

This study was approved by the Human Subject Research Panel of the Hong Kong University of Science and Technology.

#### **Research Design**

Blinding was carried out at four different levels: 1) endoscopists who performed the endoscopy and made diagnoses; 2) observers who observed and recorded patients' behaviors; 3) research assistants who performed subject-matching, data entry, and statistical analyses; and 4) patients who underwent endoscopy. Endoscopists, observers, and research assistants were all blind to the research hypotheses, the patients' medical histories, and the symptoms reported by the patients. Before and during endoscopy, patients were not given any specific suggestions of their diagnosis. They were given a list of possibilities, including DU, FD, and other common GI problems (eg, esophagitis and acute gastritis) before the endoscopy. Their endoscopic diagnosis was given when they were debriefed.

#### Measures

The diagnosis of FD and DU was established according to the Rome II criteria (2). These criteria were adopted because of their restrictive nature, which can provide both a clear distinction between functional (ie, FD) and structural (ie, DU) GI disorders and a precise diagnosis of FD by excluding other functional GI problems (eg, irritable bowel syndrome and functional dysphagia). According to the Rome II criteria, the diagnostic criteria for FD include 1) the presence of dyspeptic symptoms (eg, epigastric pain, bloating, vomiting, and nausea) in the upper abdomen, and 2) the absence of endoscopic evidence of any acid-peptic or neoplastic disease of the esophagus, stomach, pancreas, or hepatobiliary system to explain the symptoms. The diagnostic criteria of DU include the first criterion but differ from those of FD in having endoscopic evidence of a mucosal breach for more than 5 mm in the duodenum. Hence, endoscopy plays an important role in the diagnostic process that distinguishes FD from DU.

Endoscopy is a nonsurgical procedure that has been universally used in the investigation of GI disorders. It is now considered the "gold standard," primarily because it allows direct visualization and biopsy of the esophagus, stomach, and duodenum (56). Previous comparative studies (57, 58) showed that endoscopy is superior to the method of double-contrast barium meal. All patients received local anesthetic in the form of a spray to the throat. No other sedation was used during the 5-minute procedure. There are no differences in the duration of endoscopy and the extent of difficulty in intubating the gastroscope between DU and FD patients. In this study, all endoscopists had more than 8 years of experience in performing endoscopy.

For the assessment of observed coping behaviors, an observation checklist was developed for this study. In a series of pilot studies that lasted for 6 months, two independent observers observed and recorded patients' behaviors in the waiting room of the gastroenterology section of the hospital while the patients were waiting to undergo endoscopy. Then the recorded behaviors were discussed thoroughly by the observers and a psychologist in a meeting. Coping behaviors deemed similar in nature were rephrased and combined into a single item to avoid redundancy. A total of 15 coping items were included in the final checklist (see Table 1). Before this study, we conducted a validation study to examine the criterion-related validity of this new instrument. In this validation study, the coping behaviors of 50 consecutive FD and DU patients were observed and recorded. Then these patients were instructed to categorize the endorsed coping behaviors into one of the four types of coping strategies: 1) problem-focused coping, 2) emotion-focused coping, 3) instrumental support, and 4) socioemotional support. Subjects were reminded that they might have more than one goal when using a particular coping strategy, but they had to select the one that represented their primary goal. On completion of the categorization task,

TABLE 1. Frequencies of Observed Coping Behaviors (N = 30in each group)

Observed Coping Behavior	FD	DU	р
Looked inside the endoscopy room	18	7	<.01
Looked at patient(s) who came out of the endoscopy room	22	7<	<.001
Avoided looking at patient(s) who came out of the endoscopy room	7	18	<.01
Read information about endoscopy	10	5	NS
Read a book/newspaper/magazine	7	13	NS
Closed eyes for a rest/praying/meditation	7	18	<.01
Took a deep breath	5	7	NS
Took a nap	1	6	<.05
Asked healthcare personnel for information about endoscopy	15	5	<.01
Asked healthcare personnel for help other than information	9	4	NS
Asked other patient(s) for information about endoscopy	11	4	<.05
Asked other patient(s) for help other than information	10	7	NS
Chatted with healthcare personnel	9	6	NS
Chatted with other patient(s)	7	15	<.05
Sought reassurance from healthcare personnel	8	8	NS

they filled out two well-validated Chinese measures, the Ways of Coping Scale (59, 60) and the Inventory of Socially Supportive Behaviors (61, 62). The former is a coping measure in which respondents indicate their preferences for using problem-focused coping strategies and emotion-focused coping strategies. The latter is a measure of social support in which respondents report their tendency to seek a variety of instrumental and socioemotional supportive behaviors. Results revealed significant relationships between the observed behaviors and the respective coping styles (r values = 0.29–0.35, p values < .05), indicating the coping items endorsed in the new checklist do reflect patients' coping styles. Moreover, both the pilot studies and the main study revealed high interobserver reliability (weighted  $\kappa$  values = 0.81–0.90).

For the assessment of the anxious mood state, the anxiety subscale (State Form) of the MAACL-R (63) was used. Subjects reported their anxious moods both before and after endoscopy by choosing the adjectives that best described their feelings "at the moment." A higher score indicates a higher level of anxious mood. The Chinese version of the MAACL-R had good internal consistency ( $\alpha = 0.91$ ).

For the assessment of subjective appraisals of endoscopy, a new questionnaire, the Endoscopy Appraisals Scale (EAS), was developed for this study. The EAS uses multiple visual analog scales to assess subjects' appraisals of endoscopy. The first item taps the extent of pain experienced during the endoscopy. Subjects were asked to rate the degree of pain along a 10-cm visual analog scale with "no painful feelings at all" at one extreme and "extremely painful" at the other. The next item taps the extent of discomfort experienced during endoscopy. Subjects rated the degree of discomfort along another 10-cm visual analog scale with "no uncomfortable feelings at all" at one extreme and "extremely uncomfortable" at the other. The last item taps the extent of satisfaction toward endoscopy. Subjects rated the degree of satisfaction along a 10-cm visual analog scale with "not satisfied at all" at one extreme and "extremely satisfied" at the other. Subjects' ratings of these items (with reverse coding of the item tapping satisfaction) were aggregated to form an appraisal score. A higher score indicates a more negative appraisal of the endoscopy. Our validation study showed that the EAS had good internal consistency ( $\alpha = 0.86$ ) and test-retest reliability (weighted  $\kappa = 0.89$ ). The EAS also correlated significantly with the satisfaction subscale of psychological well-being (r = 0.39, p < .05), indicating good criterion-related validity for this measure. Moreover, consistent with previous findings (64, 65), results of the validation study showed that the EAS could distinguish between FD and DU patients, thus demonstrating good discriminative validity.

#### Procedures

FD and DU subjects who met the inclusion criteria were asked to complete the MAACL-R in the waiting room, which was located outside the endoscopy room. The waiting time ranged from 50 to 60 minutes, and there were no differences in the amount of waiting time between the two groups. Two independent observers sat in two different corners of the waiting room and recorded subjects' behaviors on the observation checklist. To avoid subjects' awareness of being watched, observers recorded their observations in an incognito manner by acting as if they were filling in medical forms.

After the endoscopy, subjects were asked to complete the EAS and the MAACL-R. When completing the MAACL-R, subjects were reminded to report their feelings at that time (ie, after the endoscopy) rather than during or before the endoscopy. Then they were shown the coping items in the checklist endorsed by the observers and were instructed to categorize each item into one of the goals of using that coping strategy (ie, problem-focused, emotion-focused, instrumental support, or socioemotional support). After accomplishing these tasks, they were debriefed, informed of their diagnosis, and thanked for their participation.

#### Data Analysis

A MANOVA was conducted to examine the overall main and interaction effects of group, sex, age, and SES on the observed coping behaviors; time 1 and time 2 anxious mood; and appraisals of endoscopy. If significant differences were found, another set of MANOVA and post hoc independent-samples *t* tests were used to provide a more refined view on the differences in a specific variable. Because anxious mood was examined at two time points, a mixeddesign MANOVA was conducted to examine both the within-subject effect of time (time 1 vs. time 2) and the between-subjects effect of group (FD group vs. DU group) on this variable.

#### RESULTS

The MANOVA results showed an overall main effect of group (F(7,14) = 9.42, p < .001; effect size = 0.83). The main and interaction effects of sex, age, and SES were nonsignificant (F values < 1.39, NS). Table 2 presents descriptive statistics on all the major variables for the two groups.

For the four types of observed coping behaviors, the MANOVA results revealed a significant group effect (F(4,55) = 23.43, p < .001; effect size = 0.63). Post hoc independent-samples t tests showed that, compared with their DU counterparts in coping with first-time endoscopy, FD subjects tended to use more problem-focused coping but less emotion-focused coping (t(58))

Variable	FD Group		DU Group			
	Mean	SD	Mean	SD	ρ	
Problem-focused coping	3.33	1.60	1.27	1.53	<.001	
Emotion-focused coping	1.80	1.77	4.13	2.16	<.001	
Instrumental support	3.00	2.02	1.33	1.60	<.01	
Socioemotional support	1.60	1.77	1.93	1.86	NS	
Anxious mood (time 1)	38.30	3.13	35.50	2.51	<.01	
Anxious mood (time 2)	36.80	3.51	32.10	3.17	<.001	
Appraisals of endoscopy	18.83	3.45	7.07	3.93	<.001	

TABLE 2. Descriptive Statistics of Major Variables (N = 30 in each group)

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values = 5.11 and -4.58, p values < .001). They also tended to seek more instrumental support than did DU subjects (t(58) = 3.54, p < .01).

Results of the mixed-design MANOVA showed significant main effects of group and time (F(1,58) values = 37.02 and 28.67, p values < .001; effect size = 0.39 and 0.33). However, these main effects should be interpreted in light of the significant Group by Time interaction effect (F(1,58) = 4.31, p < .05; effect size = 0.07). Post hoc independent-samples t tests revealed that FD subjects tended to have higher levels of anxious mood at both time 1 and time 2 than DU subjects had (t(58) values = 3.52 and 6.37, p values < .01). Although both groups generally showed a reduction in anxious mood scores over time, DU subjects tended to have a greater extent of reduction than did FD subjects (t(58) = 2.08, p < .05).

For appraisals of endoscopy, independent-samples t tests showed that FD subjects reported having more negative appraisals of the endoscopy than DU subjects had (t(58) = 12.32, p values < .001). Specifically, FD subjects reported more pain, discomfort, and dissatisfaction than did DU subjects (t(58) values > 7.14, p values < .001).

#### DISCUSSION

The present study was a first attempt to examine how FD and DU subjects coped with first-time endoscopy. This study contributes to the existing literature by revealing considerable differences in coping behaviors and subjective appraisals of endoscopy between the two groups. As shown by the observational data, FD subjects tended to use more problem-focused coping and less emotion-focused coping while waiting to undergo endoscopy for the first time. Although subjects in this study are from a select sample, these results are also consistent with our previous findings (13, 14) because they show that the behavioral characteristic of FD patients is largely action-oriented in handling a real-life stressor. One possible reason for their tendency to use an action-oriented coping style is that FD patients, who are characterized by a monitoring perceptual style (14), may be especially sensitive to danger cues related to their body and environment. Compared with others with a blunting perceptual style, FD patients are more motivated to use problemfocused coping as an attempt to "fight" the perceived danger. Another possible reason is that they tend to perceive their symptoms as more severe than do their counterparts with DU (64, 66), and may thus feel more anxious before the endoscopy. Hence, they may be more active in using problem-focused coping to handle the stressful event and reduce their heightened anxiety. Although problem-focused coping has generally been considered useful in reducing stress-related anxiety (67), recent work on situational influence on coping effectiveness (50) revealed that people who use problem-focused coping in uncontrollable stressful situations experience higher levels of anxiety than those who use emotion-focused coping.

This study extended previous work by adding an interpersonal element to the study of coping in GI patients. The present results show that in dealing with the stress elicited by first-time endoscopy, FD patients tended to seek more instrumental support from both healthcare personnel and other patients than DU patients did. In our recently completed longitudinal study (Cheng et al., unpublished observations, 2002), emotional support, but not instrumental support, was found to be a resource factor that mitigated the severity of FD symptoms over time. It is not surprising that the current sample of FD patients, who tended to seek more instrumental support, experienced higher levels of anxiety both before and after the endoscopy than did their DU counterparts.

Because it used a relatively more objective observational method, this study may provide more solid evidence for the action-oriented coping pattern of FD subjects. Specifically, the action-oriented coping pattern of FD subjects may reflect not just their coping disposition but also their actual coping behaviors in a stressful encounter. Although the observational method has considerable advantages over the self-report method, a major purpose of this study was to introduce a new method so that researchers have an alternative to choose from when studying coping among GI patients. All methods have their own advantages and limitations (50). A major limitation of the observational method is that it is not always possible to conduct an observation in every stressful situation. Moreover, the observational method is both manpower-intensive and time-consuming. Because only a relatively small number of subjects can be examined in observational studies, certain multivariate statistical analyses, such as regression analyses and path analyses, cannot be conducted because of the small sample size (69). Researchers who have limited manpower resources, are under time constraints, or would like to conduct multivariate statistical analyses may prefer self-report methods.

Several shortcomings of this study should be noted. First, given the highly contextualized nature of coping (70, 71), the observed coping behaviors as revealed in this study may be confined to those used to cope with first-time endoscopy. The coping repertoire outlined in the behavioral checklist may not necessarily be generalizable to the actual coping behaviors for han-

dling other real-life stressful events. Second, to match the demographic characteristics of the DU subjects, the present sample of FD subjects consisted of a greater proportion of males and was older in comparison to the samples of previous FD studies (13, 14, 54, 55). Hence, caution should be taken when attempting to generalize the present results concerning FD subjects to individuals with FD, especially those who do not seek medical consultation (54, 55). Third, to maintain an identical baseline level of social support, only subjects who were at the hospital alone were recruited for this study. It is possible that FD and DU patients who are accompanied by relatives and friends have different characteristics than the present sample of patients. Patients accompanied by relatives and friends may be less anxious and have different coping patterns than those who are alone. Fourth, although the observational method enhances the ecological validity of research on stress and coping, a major limitation of this method is that only overt coping behaviors can be examined. Covert behaviors such as thoughts and feelings, which constitute a significant part of individuals' daily behaviors (72), cannot be tapped. Finally, given the correlational nature of this study, whether FD patients' unique coping style is an antecedent factor contributing to the pathogenesis of their dyspeptic symptoms or a manifestation of their illness behaviors still remain unknown. However, the use of DU, which has a symptom spectrum similar to that of FD, as a control makes the latter possibility less likely.

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