

## Observational Study

## Snapshot of an integrated psychosocial gastroenterology service

Sarah W Kinsinger, Sarah Ballou, Laurie Keefer

Sarah W Kinsinger, Sarah Ballou, Laurie Keefer, Division of Gastroenterology, Northwestern University Feinberg School of Medicine, Chicago, IL 60611, United States

**Author contributions:** Kinsinger SW performed the majority of the study design and manuscript preparation (*i.e.*, data collection, data entry, interpretation and writing); Ballou S contributed to data entry, analysis and interpretation of results; and Keefer L contributed to study design, interpretation of results and editing of final manuscript.

**Open-Access:** This article is an open-access article which was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

**Correspondence to:** Sarah W Kinsinger, PhD, Assistant Professor of Medicine and Psychiatry, Division of Gastroenterology, Northwestern University, 676 N. St. Clair St., suite 1400, Chicago, IL 60611,

United States. [s-kinsinger@northwestern.edu](mailto:s-kinsinger@northwestern.edu)

Telephone: +1-312-6959317

Fax: +1-312-6957095

Received: May 27, 2014

Peer-review started: May 28, 2014

First decision: June 18, 2014

Revised: July 11, 2014

Accepted: September 5, 2014

Article in press: September 5, 2014

Published online: February 14, 2015

### Abstract

**AIM:** To characterize the patients utilizing a gastroenterology behavioral medicine service and examine the effect of treatment on health care utilization.

**METHODS:** Patients were referred by their gastroenterologists for psychological treatment during a

15 mo period. Patients seen for an intake with a psychologist completed the Brief Symptom Inventory (BSI) and a checklist of psychosocial concerns. A subset of patients with functional bowel disorders also completed a disease specific quality of life measure. Chart review was conducted to obtain information on type and frequency of sessions with the psychologist, the number of outpatient gastroenterology visits, and number of gastroenterology-related medical procedures during the 6 mo following psychological intake.

**RESULTS:** Of 259 patients referred for treatment, 118 (46%) completed an intake with a psychologist. Diagnoses included: irritable bowel syndrome (42%), functional dyspepsia (20%), inflammatory bowel diseases (20%), esophageal symptoms (10%), and "other" (8%). Demographic variables and disease type did not differentiate between those who did and did not schedule an intake. Mean *t*-scores for the BSI global score index and the depression, anxiety, and somatization subscales fell below the cutoff for clinical significance ( $t = 63$ ). Treatments were predominantly gut-directed hypnosis (48%) and cognitive behavioral therapy (44%). Average length of treatment was 4 sessions. Among functional gastrointestinal (GI) patients, those patients who initiated treatment received significantly fewer GI-related medical procedures during the 6 mo following the referral than patients who did not schedule an intake [ $t(197) = 2.69, P < 0.01$ ].

**CONCLUSION:** Patients are receptive to psychological interventions for GI conditions and there is preliminary evidence that treatment can decrease health-care utilization among patients with functional GI conditions.

**Key words:** Psychological treatment; Irritable bowel syndrome; Functional gastrointestinal disorders; Hypnosis; Cognitive-behavioral therapy

© The Author(s) 2015. Published by Baishideng Publishing

Group Inc. All rights reserved.

**Core tip:** Psychological interventions are effective treatment options for many chronic gastrointestinal conditions, particularly functional bowel disorders. However, psychological care has not been well integrated into standard clinical practice for gastrointestinal disorders. The aim of the current study was to examine the feasibility and acceptability of offering psychological services to patients in an outpatient gastroenterology practice and the potential impact of treatment on health care utilization.

Kinsinger SW, Ballou S, Keefer L. Snapshot of an integrated psychosocial gastroenterology service. *World J Gastroenterol* 2015; 21(6): 1893-1899 Available from: URL: <http://www.wjgnet.com/1007-9327/full/v21/i6/1893.htm> DOI: <http://dx.doi.org/10.3748/wjg.v21.i6.1893>

## INTRODUCTION

Chronic gastrointestinal (GI) problems account for a significant proportion of physician workload in outpatient gastroenterology practices. Inflammatory bowel diseases (IBD) and functional bowel disorders jointly account for more than half of the patients seen by gastroenterologists<sup>[1]</sup>. The cost of managing these conditions is high. The estimated direct cost of irritable bowel syndrome (IBS) alone is estimated to be 1.3 billion in the United States and is similar to other chronic medical conditions such as asthma, hypertension, and congestive heart failure<sup>[2,3]</sup>. In addition, the psychosocial impact of chronic digestive symptoms is significant. Patients with both functional (*e.g.*, IBS) and organic GI conditions (*e.g.*, IBD) experience impaired quality of life (QOL) and increased rates of psychological distress<sup>[4,5]</sup>.

Traditional medical treatments are often inadequate for managing functional gastrointestinal conditions, particularly for patients with moderate to severe symptoms<sup>[6]</sup>. As a result these patients often pursue alternative treatment options. In fact more than 50% of patients with IBS and IBD turn to complementary and alternative medicine treatments and nearly 1/3 of patients with IBD express interest in psychological treatment<sup>[7-9]</sup>.

Psychological interventions are now well-established, effective treatments that can complement usual medical care for many chronic GI conditions. Cognitive behavioral therapy and gut-directed hypnosis are empirically supported interventions for IBS and the American Gastroenterological Association recommends psychological treatments for moderate to severe patients<sup>[10-12]</sup>. In addition to IBS, gut-directed hypnotherapy has been demonstrated as an effective treatment for functional dyspepsia, non-cardiac chest pain, and acid reflux<sup>[13-15]</sup>. Less is

known about the benefits of stress management and behavioral interventions for IBD. However, emerging evidence indicates that psychological interventions are beneficial for improving mood, QOL, and even prolonging remission in IBD patients<sup>[16,17]</sup>.

Many of these positive outcomes can be attributed to patients' increased self-efficacy to manage and cope with their digestive condition, thereby reducing burden on medical providers<sup>[18]</sup>. There is some empirical evidence that psychological treatments can decrease health care utilization. For example, relaxation training contributed to less frequent doctor visits among IBS patients and psychological treatment was associated with reduced health care costs in patients with IBS<sup>[19,20]</sup>.

Despite the documented benefits of psychological interventions for GI conditions, these treatments have not been well integrated into gastroenterology practices and are not easily accessible to patients. Many barriers have been suggested, including concerns about reimbursement for behavioral services, referrals only being made for patients with significant psychological symptoms, and the misconception that patients are not receptive to psychological interventions<sup>[11]</sup>. Palsson and Whitehead recently published a primer for gastroenterologists, encouraging providers to consider referring patients with functional GI conditions for psychological treatment and recommendations on making a successful referral<sup>[6]</sup>. Their article is an important step in explaining how these treatments can become more integrated into the care of patients with chronic GI conditions. The purpose of the current study is to demonstrate how this integration can occur in a clinical context. This is the first study that we are aware of to evaluate the acceptability and feasibility of offering behavioral treatment as part of routine clinical practice within a gastroenterology clinic.

The goal of the current study was to characterize an integrated psychological gastroenterology service and examine impact of this service on health-care utilization. Specific aims were to: (1) examine the number of patients referred and proportion of patients that engaged in psychological treatment for their GI condition; (2) determine any demographic or disease related variables that might influence the likelihood of a patient pursuing treatment; (3) characterize the psychosocial functioning of patients pursuing behavioral treatment; and (4) among patients with functional GI conditions, evaluate the impact of receiving behavioral medicine services on health care utilization (*i.e.*, physician office visits, medical procedures).

## MATERIALS AND METHODS

### Study patients

This is a retrospective cross-sectional study of patients with chronic GI conditions referred to a GI health psychology service during a 15-mo period from

2010-2011 at our outpatient faculty practice group at Feinberg School of Medicine, Northwestern University. All referrals were made by gastroenterologists within our outpatient practice. Referrals were not accepted from outside providers. Patients had undergone a thorough GI work-up prior to being referred for psychological services. Table 1 provides a list of criteria that we recommend physicians in our practice follow to guide them in referring appropriate patients. Gastroenterologists referred patients by explaining the rationale for psychological treatment and providing patients with a brochure with further details about the services. The gastroenterologist also placed a formal referral through our electronic medical record system that is routed to a patient-liaison who then contacts the patient. This initial phone call provides the patient with opportunity to ask additional questions about behavioral medicine services, schedule the initial appointment, and review insurance coverage for the visit. Any patient referred for management of a chronic gastrointestinal condition during this 15-mo period is included in our sample, including patients who did not respond to the referral.

### Measures

The following psychosocial questionnaires were completed by patients at their intake visit with the psychologist as standard clinical practice. A subset of the sample (*i.e.*, patients with functional bowel disorders;  $n = 43$ ) also completed a QOL measure.

**Demographics and psychosocial history:** A short demographic and psychosocial checklist was completed by each patient, which includes basic demographic data (*e.g.*, age, gender, marital status, education) as well as a checklist of current and past psychosocial concerns (PSC). The checklist included 36 items of common psychological difficulties (*e.g.*, depression, anxiety, difficulty managing stress, history of abuse, anger). Patients checked "yes" if they had ever experienced the difficulty. Patients also indicated to what extent they believed that stress impacted the course and treatment of their GI condition, a good marker of psychological insight and appropriateness for behavioral intervention.

**Brief symptom inventory:** BSI is an 18-item questionnaire used to assess psychological distress<sup>[21]</sup>. The BSI yields a total (general distress) T-score and 3 subscale T-scores for depression, anxiety, and somatization. Higher scores represent greater distress. The cutoff for clinical significance for each scale is  $t = 63$ . The BSI has good internal reliability (0.71-0.85) and test-retest reliability (0.68-0.91).

**IBS-QOL questionnaire:** IBS-QOL questionnaire is a 34-item measure designed to assess the im-

**Table 1 Guidelines for appropriate referrals for health psychology services**

Appropriate referrals
Patients with moderate to severe functional symptoms who have not responded to medical management (Palssson and Whitehead, 2013)
Stress or emotional factors are exacerbating gastrointestinal (GI) symptoms
Any patient interested in non-pharmacological treatment of functional GI symptoms
Patients newly diagnosed with chronic GI illness ( <i>e.g.</i> , crohn's disease; ulcerative colitis)
Any patient needing assistance coping with chronic, uncomfortable GI symptoms
Inappropriate referrals
Patients with significant psychological symptoms that are independent of the GI condition
Current severe psychiatric symptoms (suicidal ideation, psychotic disorder, obsessive-compulsive disorder)
Active eating disorder
Low insight into the role of stress on his/her GI condition
Poor motivation to engage in psychological treatment

part of bowel habits on overall functioning and QOL for people with IBS or related functional bowel disorders<sup>[22]</sup>. Each item has a 5-point response scale (1 to 5). Item scores were reversed and then summed to derive an overall QOL index and 8 subscales (dysphoria, interference with activity, body image, health worry, food avoidance, social reactions, sexual activity, and relationships). Scores were transformed to a 1 to 100 scale ranging from 0 (poor QOL) to 100 (maximum QOL).

### Retrospective chart review

Chart review was conducted on all patients referred to our service irrespective of following through with a behavioral medicine intake and included: medical diagnosis, number of physician office visits during the 6 mo following the behavioral medicine referral (including emergency room visits or primary care physician visits related to their condition) and number of diagnostic procedures related to their gastrointestinal condition in the 6 mo following the referral. Diagnostic procedures included blood work, stool studies, breath testing, imaging, and endoscopy procedures. Additionally, the number and type of treatment sessions with a psychologist was collected for patients participating in BMed treatment.

### Statistical analysis

Statistical analysis were completed using SPSS 18.0 for Windows (SPSS Inc., Chicago IL, United States). Statistical significance was set at  $P < 0.05$  for all analyses. Demographics and psychosocial characteristics of the sample were completed computing frequencies, means, standard deviations, and percentages where applicable. We used logistic regression to examine demographic and disease variables as predictors of whether or not patients initiated treatment. Logistic regression was also used

**Table 2** Demographics based on response to referral

	Patients seen for an initial intake ( <i>n</i> = 118)	Patients not seen for an intake ( <i>n</i> = 141)
Demographics		
Average age	40	38
Gender (% female)	71	79
Disease type		
IBD	22	29
Functional bowel	49	59
Dyspepsia	23	30
Esophageal	15	11
Other	9	12

Patients seen for an initial intake: Includes all patients evaluated by a psychologist, including both functional GI disorders as well as other disease groups; Patients not seen for an intake: Includes all patients that were referred for psychological services by their gastroenterologist, but did not meet with a psychologist; "Other" disease group: Chronic pancreatitis, celiac disease, non-cardiac chest pain, rumination syndrome, functional vomiting, gastroparesis, eosinophilic disease, and aerophagia. Diagnosis Type refers to the patients diagnosed with each disease type. IBD: Inflammatory bowel diseases; GI: Gastrointestinal.

to examine differences in HCU among patients who did and did not engage in BMed treatment.

## RESULTS

### Demographics

A total of 259 internal referrals for psychological treatment were identified from February, 2010 through May, 2011. Diagnoses included IBS (42%), functional dyspepsia (20%), IBD (20%), esophageal symptoms (10%), and "other" (8%; *e.g.*, chronic pancreatitis, non-cardiac chest pain, rumination syndrome, functional vomiting, gastroparesis, aerophagia). The majority of referrals (76.8%; *n* = 199) were for patients diagnosed with some type of functional GI condition (*e.g.*, IBS, functional abdominal pain, functional dyspepsia, functional vomiting, esophageal hypersensitivity). Average age was 38 (range: 19-88) and 76% were female. Table 2 provides a breakdown of demographic data for all patients referred based on whether or not the patient met with a psychologist for an initial visit.

Nearly half of patients referred for treatment scheduled an intake with a psychologist (*n* = 118) and 113 of these patients completed intake forms. The following demographics were obtained from the intake forms of these 113 patients: marital status was predominantly single, divorced, or widowed (61%); patients were predominantly college educated (73%); 95% indicated that stress has a moderate or severe impact on the course or treatment of their GI condition.

### Feasibility and acceptability

Of the 259 patients referred for treatment, 118 (46%) met with a psychologist for an intake. Approximately one-third (*n* = 87; 34%) engaged in ongoing

psychological treatment with a therapist. Treatments were predominantly gut-directed hypnosis (48%) and cognitive behavioral therapy (CBT, 44%). Mean length of treatment was 4 sessions (SD = 4.32, range: 1-21).

### QOL

Disease-specific QOL was obtained from a subset of patients who were diagnosed with a functional bowel disorders using the IBS-QOL (*n* = 43). Mean IBS-QOL was 58.94. Food avoidance (38.6) was the most impaired subscale domain, followed by dysphoria (52.2), interference with activity (56.8) and health worry (58.8). These symptom reports are comparable to scores reported in the IBS literature<sup>[22,23]</sup>.

### Psychosocial characteristics

Frequency of psychosocial concerns and mean BSI scores were calculated on the entire sample of patients that completed intake forms with the psychologist (*n* = 113). The most frequently reported PSC included anxiety (75%), worry (63%), and difficulty managing stress (61%). Mean *t*-scores were calculated for the BSI total score and individual subscales. *T*-scores for the total score (*t* = 51.12), depression (*t* = 51.34), anxiety (*t* = 51.28), and somatization (*t* = 50.04) scales all fell below the cutoff for clinical significance (*t* = 63), indicating that on average these patients did not report clinically significant mood difficulties.

Logistic regression analyses were run on the entire sample to determine whether demographic and disease variables predicted whether or not patients followed up on the referral for psychological services. Results indicated that demographic variables (age, gender) and disease type (IBS, functional dyspepsia, IBD, esophageal symptoms, and "other") did not differentiate between those who did and did not pursue treatment (all *P* > 0.13).

### Health care utilization

Logistic regression was used to examine differences in HCU among patients who did and did not engage in psychological treatment. These analyses were limited to those patients diagnosed with some type of functional GI disorder (*n* = 199). Among functional GI patients (*n* = 199), those patients who initiated treatment received significantly fewer GI-related medical procedures during the 6 mo following the referral than patients who did not [*t* (197) = 2.69, *P* < 0.01], with those in treatment receiving fewer procedures (0.38 vs 0.79). There was no difference in the number of physician office visits (0.43 vs 0.54).

## DISCUSSION

Chronic GI disorders cause significant quality of life impairment and account for a significant pro-

**Table 3 Myths and misconceptions of psychological treatments for gastrointestinal conditions**

Myth	Fact
Only patients with significant psychological distress will benefit from working with a health psychologist	The majority of patients seen in our clinic do not suffer from a psychological disorder and yet benefit significantly from treatment
Only patients with functional GI conditions are appropriate for referral to psychologist	Patients with a wide-range of GI conditions can benefit (crohn's, ulcerative colitis, chronic pancreatitis, GERD); 20% of patients in this study had IBD
Psychological treatments are expensive	Psychological treatments are often covered by insurance and are associated with reduced long-term health-care costs.
Psychological treatment requires significant time commitment	Many patients can benefit in as few as 4 sessions

GI: Gastrointestinal; IBD: Inflammatory bowel diseases; GERD: Gastroesophageal reflux disease.

portion of health care utilization<sup>[24]</sup>. There is strong empirical evidence that psychological treatments for functional GI disorders are beneficial; however, the implementation of these treatments in a clinical setting has lagged behind. The results of the present study indicate that it is feasible to implement these treatments in an outpatient GI clinic and that many of the barriers to treatment that have been suggested in the past can be overcome<sup>[11]</sup>. Table 3 provides a list of common myths about psychological treatments for GI patients and corresponding facts based on findings of this study and our experience running an integrated psychosocial GI service.

Our findings suggest that many patients are in fact receptive to and interested in psychological treatment. Over 200 patients were referred for psychological treatment within a 15-mo time span and nearly half of these patients met with a psychologist. Historically, referrals for psychological treatments are only considered for patients who are significantly distressed. Our experience has been that even patients who are functioning quite well emotionally can still benefit from these treatments. The majority of the patients in the current study identified stress as a contributing factor to their GI condition, but they were not suffering from a psychological disorder. These findings are contrary to the perception that only highly anxious or depressed patients will benefit or be interested in meeting with a psychologist.

It is notable that patients with a wide range of GI conditions utilized behavioral treatments. Traditionally, psychological referrals are only considered for patients with functional conditions. However, 20% of the referrals made in this study were for patients with inflammatory bowel disease and patients with various organic GI conditions are commonly seen by the health psychologist in our clinic (*e.g.*, celiac sprue, pancreatitis, eosinophilic gastrointestinal diseases). Our experience has been that IBD patients in particular are eager to work with a GI health psychologist and this is consistent with research findings<sup>[9]</sup>. Furthermore, patient demographics did not influence whether or not patients pursued health psychology services. This should encourage gastroenterologists to consider referring a wide range of patients and not assume that certain demographic groups (*e.g.*,

elderly) would not be interested.

Our findings are consistent with past research indicating that psychological interventions can reduce healthcare burden. For example, Creed *et al.*<sup>[19]</sup> found that psychological intervention, but not antidepressant medication, was associated with reduced health care costs, largely due to fewer gastroenterology follow-up visits. Similarly, our results indicate that functional GI patients who participate in psychological treatment are less likely to need further medical procedures for their GI condition. Although psychological treatments may require greater time investment from the patient initially, there is less long-term medical follow-up needed (outpatient visits, medical procedures, medications); thereby reducing burden on patients and providers. Given the effectiveness of psychological treatments for GI conditions, it is not surprising that patients engaged in these treatments were in less need of medical attention.

Another significant finding from this study is the short-term nature of treatment. The average length of treatment in our study was 4 sessions. These findings are consistent with past research indicating that a significant proportion of IBS patients treated with CBT respond to treatment within 4 wk (referred to as rapid responders) and maintain symptom improvement for at least 3 mo<sup>[10]</sup>. These findings are contrary to the misconception that psychological treatment requires a long-term time commitment. CBT is designed to be a short-term skills-based treatment that teaches the patient to self-manage their condition. Patients will be more likely to consider psychological treatment if they understand that this is a short-term investment. It is notable that the treating provider in this study is a health psychologist with specific training and experience in gastroenterology. Implementation of psychological treatments for GI conditions requires specialized knowledge and training and these same results might not be achieved by a "general" psychotherapist. Unfortunately there are a limited number of providers with this expertise, making it challenging for physicians to find psychological providers to refer to.

Our clinical experience has been that many of the suggested barriers to offering psychological treatments for gastrointestinal conditions can be

addressed with appropriate integration of these services. By having a provider on-site, offering behavioral medicine services in conjunction with medical treatment, and streamlining referrals, patients are more receptive to health psychology services. Furthermore, effective communication of the referral by the gastroenterologist is important<sup>[6]</sup>. Concerns have also been raised about financial cost as a barrier to psychological treatment. It is worth noting that health psychologists have specialized billing codes (*i.e.*, health and behavior codes) that allow for behavioral treatment to be billed under the patient's medical insurance. All patients seen for treatment in this study received behavioral intervention through their medical insurance. These billing codes not only make treatments more accessible to patients, but also de-stigmatize treatment by differentiating it from mental health treatment.

Although this study contributes important findings, its limitations should be noted. Our sample was drawn from Northwestern's outpatient gastroenterology clinic, located in downtown Chicago. This patient population is typically well-educated, affluent, and has adequate resources to benefit from psychological treatments. Additional barriers might be present for patients from different geographical areas with more diverse socioeconomic status. This study was also limited by small sample size of various disease groups. An important goal of future research will be to obtain chart review data on a larger portion of patients, collect additional measures of HCU (*e.g.*, clinic phone calls, medication use), and examine barriers to participating in psychological services. Despite these limitations, this study provides insight into the role that psychologists can play in improving care and outcomes of patients with gastrointestinal conditions.

## COMMENTS

### Background

Chronic gastrointestinal (GI) conditions can cause significant quality of life impairment and account for a significant proportion of health care utilization. Traditional medical treatments are often inadequate for managing these conditions, particularly for patients with moderate to severe functional GI disorders.

### Research frontiers

Psychological interventions such as medical hypnosis and cognitive-behavioral therapy (CBT) are empirically supported interventions for a variety of functional GI disorders, such as irritable bowel syndrome. These psychological treatments provide symptom relief in addition to improvements in mood and quality of life. Although there is strong empirical support for the use of psychological treatments with GI patients, the implementation of these interventions in clinical settings has been limited.

### Innovations and breakthroughs

This study demonstrates the feasibility of integrating psychological treatment in an outpatient GI clinic. Gastroenterologists are often hesitant to refer patients for psychological treatment due to misconceptions about these interventions and perceived barriers to treatment. The findings of this study indicate that a wide range of patients are receptive to psychological treatment and that these interventions can decrease reliance of patients on medical providers.

## Applications

This article provides a model for integrating psychological services into an outpatient GI practice and documents the benefits for both patients and providers of offering integrated psychological care.

## Terminology

CBT refers to a type of psychotherapy that is short-term, collaborative, and aimed at addressing symptoms by helping the patient change thinking, behavior, and emotional responses. CBT has been found to be effective for numerous mental and physical health disorders.

## Peer-review

This is an interesting study of the feasibility and effect of psychological interventions in the management of common GI disorders. The manuscript is well written, the tables are well organized, and the results are outlined in a very effective manner. This article will attract a significant number of readers, especially among gastroenterologists with specific interest in functional GI disorders.

## REFERENCES

- 1 **Russo MW**, Gaynes BN, Drossman DA. A national survey of practice patterns of gastroenterologists with comparison to the past two decades. *J Clin Gastroenterol* 1999; **29**: 339-343 [PMID: 10599638 DOI: 10.1097/00004836-199912000-00009]
- 2 **Inadomi JM**, Fennerty MB, Bjorkman D. Systematic review: the economic impact of irritable bowel syndrome. *Aliment Pharmacol Ther* 2003; **18**: 671-682 [PMID: 14510740 DOI: 10.1046/j.1365-2036.2003.t01-1-01736.x]
- 3 **Cash B**, Sullivan S, Barghout V. Total costs of IBS: employer and managed care perspective. *Am J Manag Care* 2005; **11**: S7-16 [PMID: 15926759]
- 4 **Häuser W**, Janke KH, Klump B, Hinz A. Anxiety and depression in patients with inflammatory bowel disease: comparisons with chronic liver disease patients and the general population. *Inflamm Bowel Dis* 2011; **17**: 621-632 [PMID: 20848528 DOI: 10.1002/ibd.21346]
- 5 **Lea R**, Whorwell PJ. New insights into the psychosocial aspects of irritable bowel syndrome. *Curr Gastroenterol Rep* 2003; **5**: 343-350 [PMID: 12864966 DOI: 10.1007/s11894-003-0073-z]
- 6 **Palsson OS**, Whitehead WE. Psychological treatments in functional gastrointestinal disorders: a primer for the gastroenterologist. *Clin Gastroenterol Hepatol* 2013; **11**: 208-16; quiz e22-3 [PMID: 23103907 DOI: 10.1016/j.cgh.2012.10.031]
- 7 **Hussain Z**, Quigley EM. Systematic review: Complementary and alternative medicine in the irritable bowel syndrome. *Aliment Pharmacol Ther* 2006; **23**: 465-471 [PMID: 16441466 DOI: 10.1111/j.1365-2036.2006.02776.x]
- 8 **Hilsden RJ**, Verhoef MJ, Best A, Pocobelli G. Complementary and alternative medicine use by Canadian patients with inflammatory bowel disease: results from a national survey. *Am J Gastroenterol* 2003; **98**: 1563-1568 [PMID: 12873578 DOI: 10.1111/j.1572-0241.2003.07519.x]
- 9 **Miehler W**, Weichselberger M, Offerbauer-Ernst A, Dejaco C, Reinisch W, Vogelsang H, Machold K, Stamm T, Gangl A, Moser G. Which patients with IBD need psychological interventions? A controlled study. *Inflamm Bowel Dis* 2008; **14**: 1273-1280 [PMID: 18393373 DOI: 10.1002/ibd.20462]
- 10 **Lackner JM**, Gudleski GD, Keefer L, Krasner SS, Powell C, Katz LA. Rapid response to cognitive behavior therapy predicts treatment outcome in patients with irritable bowel syndrome. *Clin Gastroenterol Hepatol* 2010; **8**: 426-432 [PMID: 20170751 DOI: 10.1016/j.cgh.2010.02.007]
- 11 **Palsson OS**, Whitehead WE. The growing case for hypnosis as adjunctive therapy for functional gastrointestinal disorders. *Gastroenterology* 2002; **123**: 2132-2135 [PMID: 12454867 DOI: 10.1053/gast.2002.37286]
- 12 **Tan G**, Hammond DC, Joseph G. Hypnosis and irritable bowel syndrome: a review of efficacy and mechanism of action. *Am J Clin Hypn* 2005; **47**: 161-178 [PMID: 15754863 DOI: 10.1080/00

- 029157.2005.10401481]
- 13 **Palsson OS**, Whitehead WE. Hypnosis for non-cardiac chest pain. *Gut* 2006; **55**: 1381-1384 [PMID: 16966696 DOI: 10.1136/gut.2006.095489]
  - 14 **Miller V**, Jones H, Whorwell PJ. Hypnotherapy for non-cardiac chest pain: long-term follow-up. *Gut* 2007; **56**: 1643 [PMID: 17938446 DOI: 10.1136/gut.2007.132621]
  - 15 **Calvert EL**, Houghton LA, Cooper P, Morris J, Whorwell PJ. Long-term improvement in functional dyspepsia using hypnotherapy. *Gastroenterology* 2002; **123**: 1778-1785 [PMID: 12454833 DOI: 10.1053/gast.2002.37071]
  - 16 **Keefer L**, Taft TH, Kiebles JL, Martinovich Z, Barrett TA, Palsson OS. Gut-directed hypnotherapy significantly augments clinical remission in quiescent ulcerative colitis. *Aliment Pharmacol Ther* 2013; **38**: 761-771 [PMID: 23957526 DOI: 10.1111/apt.12449]
  - 17 **von Wietersheim J**, Kessler H. Psychotherapy with chronic inflammatory bowel disease patients: a review. *Inflamm Bowel Dis* 2006; **12**: 1175-1184 [PMID: 17119392 DOI: 10.1097/01.mib.0000236925.87502.e0]
  - 18 **Keefer L**, Kiebles JL, Kwiatek MA, Palsson O, Taft TH, Martinovich Z, Barrett TA. The potential role of a self-management intervention for ulcerative colitis: a brief report from the ulcerative colitis hypnotherapy trial. *Biol Res Nurs* 2012; **14**: 71-77 [PMID: 21362636 DOI: 10.1177/1099800410397629]
  - 19 **Creed F**, Fernandes L, Guthrie E, Palmer S, Ratcliffe J, Read N, Rigby C, Thompson D, Tomenson B. The cost-effectiveness of psychotherapy and paroxetine for severe irritable bowel syndrome. *Gastroenterology* 2003; **124**: 303-317 [PMID: 12557136 DOI: 10.1053/gast.2003.50055]
  - 20 **van der Veek PP**, van Rood YR, Masclee AA. Clinical trial: short- and long-term benefit of relaxation training for irritable bowel syndrome. *Aliment Pharmacol Ther* 2007; **26**: 943-952 [PMID: 17767479 DOI: 10.1111/j.1365-2036.2007.03437.x]
  - 21 **Derogatis LR**. Brief Symptom Inventory 18. Minneapolis: National Computer Systems Pearson, Inc., 2000
  - 22 **Patrick DL**, Drossman DA, Frederick IO, DiCesare J, Puder KL. Quality of life in persons with irritable bowel syndrome: development and validation of a new measure. *Dig Dis Sci* 1998; **43**: 400-411 [PMID: 9512138]
  - 23 **Paré P**, Gray J, Lam S, Balshaw R, Khorasheh S, Barbeau M, Kelly S, McBurney CR. Health-related quality of life, work productivity, and health care resource utilization of subjects with irritable bowel syndrome: baseline results from LOGIC (Longitudinal Outcomes Study of Gastrointestinal Symptoms in Canada), a naturalistic study. *Clin Ther* 2006; **28**: 1726-1735; discussion 1726-1735 [PMID: 17157129 DOI: 10.1016/j.clinthera.2006.10.010]
  - 24 **Peery AF**, Dellon ES, Lund J, Crockett SD, McGowan CE, Bulsiewicz WJ, Gangarosa LM, Thiny MT, Stizenberg K, Morgan DR, Ringel Y, Kim HP, Dibonaventura MD, Carroll CF, Allen JK, Cook SF, Sandler RS, Kappelman MD, Shaheen NJ. Burden of gastrointestinal disease in the United States: 2012 update. *Gastroenterology* 2012; **143**: 1179-87.e1-3 [PMID: 22885331 DOI: 10.1053/j.gastro.2012.08.002]

**P- Reviewer:** Day AS, Jadallah AK **S- Editor:** Ma YJ  
**L- Editor:** A **E- Editor:** Zhang DN





Published by **Baishideng Publishing Group Inc**

8226 Regency Drive, Pleasanton, CA 94588, USA

Telephone: +1-925-223-8242

Fax: +1-925-223-8243

E-mail: [bpgoffice@wjgnet.com](mailto:bpgoffice@wjgnet.com)

Help Desk: <http://www.wjgnet.com/esps/helpdesk.aspx>

<http://www.wjgnet.com>



ISSN 1007-9327

