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BRIEF REPORT

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Association between gastrointestinal complaints and psychopathology in patients with anorexia nervosa

Ute Kessler MD PhD[1,2] | Guro Å. Rekkedal PhD[1,3] | Øyvind Rø MD PhD[4,5] | Birgitte Berentsen Msc PhD[2,6] | Elisabeth K. Steinsvik MD[2,6] | Gülen A. Lied MD PhD[2,6] | Yngvild Danielsen PhD[3]

[1]Department of Psychiatry, Haukeland University Hospital, Bergen, Norway

[2]Department of Clinical Medicine, University of Bergen, Bergen, Norway

[3]Department of Clinical Psychology, University of Bergen, Bergen, Norway

[4]Regional Department for Eating Disorders, Division of Mental Health and Addiction, Oslo University Hospital, Oslo, Norway

[5]Institute of Clinical Medicine, Faculty of Medicine, University of Oslo, Oslo, Norway

[6]National Center for Functional Gastrointestinal Disorders, Medical Department, Haukeland University Hospital, Bergen, Norway

Correspondence
Ute Kessler, MD PhD, Department of Psychiatry, Haukeland University Hospital, Bergen, Norway.
Email: ute.kessler@helse-bergen.no

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Abstract

Objective: Gastrointestinal (GI) symptoms appear frequently in patients with anorexia nervosa (AN), but the associations between psychopathological, GI, and eating disorder (ED) symptoms remain unclear. This study aimed to determine the relationships of GI complaints with psychopathological measures, ED symptoms, and body mass index (BMI) in patients with AN.

Method: Thirty outpatients with AN aged >16 years were included. Psychopathological measures (Symptom Checklist-90-Revised, Beck Depression Inventory-II, and Beck Anxiety Inventory), ED symptoms (Eating Disorder Examination Questionnaire), ED-associated impairment (Clinical Impairment Assessment Questionnaire), GI complaints (Irritable Bowel Syndrome Severity Scoring System [IBS-SSS]), and BMI were assessed prior to starting treatment, and correlation and multiple regression analyses were applied to data from 19 patients.

Results: IBS-symptoms were significantly correlated only with ED symptoms (r = 0.583, p = .009) and somatization (r = 0.666, p = .002). Multiple regression analysis revealed that somatization significantly predicted worse IBS symptoms (beta = 0.5, p = .04), while ED symptoms did not.

Discussion: Higher IBS-SSS scores were associated with higher severities of other somatic complaints. GI complaints and somatization should be addressed in treatments for AN in order to prevent these factors impeding the establishment of healthy eating patterns.

Clinical trial registration: ClinicalTrials.gov Identifier: NCT02745067.

KEYWORDS

anorexia nervosa, eating disorders, functional gastrointestinal disorders, irritable bowel syndrome, somatoform disorders

1 | INTRODUCTION

Anorexia nervosa (AN) is a debilitating psychiatric disorder with a high degree of psychiatric comorbidity (Ulfvebrand, Birgegard, Norring, Hogdahl, & von Hausswolff-Juhlin, 2015). AN is associated with a wide array of negative health complications, including gastrointestinal (GI) symptoms (Mehler & Brown, 2015; Norris et al., 2016). GI complaints are common in AN, with a reported prevalence >95% (Salvioli et al., 2013). Symptoms such as abdominal pain and discomfort, bloating, abdominal distension, and straining during bowel movements occur more frequently and are more severe in patients with AN than in healthy controls (Mack et al., 2016). Comorbid GI symptoms in AN might represent a preexisting organic disease, be related to a pathological eating disorder (ED) behavior (e.g., self-induced vomiting or laxative abuse), represent a consequence of malnutrition and weight loss, be functional in nature, or represent a combination of all of these possibilities (Boyd, Abraham, & Kellow, 2005; Kress, Paslakis, & Erim, 2018). A recent comprehensive literature search of the medical causes of food-related GI symptoms found that the prevalence of immunological or structural GI disorders was similar in patients with ED and the general population. GI complaints are frequent in AN, and most of them are likely to be functional (Kress et al., 2018). Boyd and colleagues found that 98% of patients admitted to an ED unit fulfilled the Rome II criteria for at least one specific functional gastrointestinal disorder (FGID), predominantly irritable bowel syndrome (IBS) (Boyd et al., 2005). A more recent study also lists a new FGID, postprandial distress syndrome (PDS) as a common disorder in patients with AN, manifesting as delayed gastric emptying and early satiety (Wang, Luscombe, Boyd, Kellow, & Abraham, 2014).

Nutritional rehabilitation and weight normalization are key components in the treatment of AN. However, the nutritional rehabilitation of patients with AN is often complicated by comorbid GI symptoms (Mascolo, Geer, Feuerstein, & Mehler, 2017; Wang et al., 2014). Addressing the GI complaints in this phase of treatment is challenging since they might represent a barrier to increasing the food intake. When rare structural GI disorders are excluded, GI symptoms need to be addressed cautiously so as to facilitate refeeding of the patient. Except for Boyd and colleagues' research (Boyd et al., 2005; Wang et al., 2014), studies assessing the interplay between psychopathological, GI, and ED symptoms are scarce. A relevant question is whether GI complaints in AN are mainly associated with the ED pathology and low weight, or also with another psychopathology such as depression, anxiety, or somatization.

2 | METHOD

This study formed part of an ongoing longitudinal treatment trial assessing the efficacy of cognitive behavioral therapy (CBT-E) (Danielsen, Ardal Rekkedal, Frostad, & Kessler, 2016). The current study had a cross-sectional design in which patients were assessed prior to starting treatment. The diagnosis was established by the treating therapist (psychiatrist/psychologist) based on clinical interview and examination according to DSM 5 criteria. The diagnosis was further confirmed in an interdisciplinary clinical staff meeting. All patients were assessed by a medical doctor in order to, among other things, exclude structural GI disorders.

The study was approved by the Regional Committee for Medical and Health Research Ethics, Western Norway (REK Vest 2015/2328).

2.1 | Participants

All patients who agreed to receive CBT-E for AN at our outpatient unit between December 2016 and January 2019 were asked to participate in the study. The study included 30 outpatients with AN aged >16 years. Seven patients did not provide sufficient information about IBS symptoms, and three patients were excluded due to having a body mass index (BMI) of >18.5 kg/m^2. Data from one patient with a history of gastric surgery were also excluded, resulting in 19 patients being eligible for the statistical analyses.

2.2 | Assessment: Self-report questionnaires

2.2.1 | Irritable bowel syndrome severity scoring system

The Irritable bowel syndrome severity scoring system (IBS-SSS) is a validated questionnaire for monitoring the severity of IBS symptoms. It consists of five items related to abdominal pain, abdominal distension, bowel dysfunction, and quality of life/global well-being scored on a visual analog scale from 0 to 100 points.

Mild, moderate, and severe cases are indicated by total scores of 75–175, 175–300, and >300, respectively (Francis, Morris, & Whorwell, 1997).

2.2.2 | Eating disorder examination questionnaire

The eating disorder examination questionnaire (EDE-Q) is a 28-item instrument measuring eating pathology on a scale from 0 to 6 points (Fairburn & Beglin, 2008). The present study used the global EDE-Q score since there is limited evidence for its original four-factor structure, and several studies have proposed that the global score is an acceptable indicator of overall eating pathology (Friborg, Reas, Rosenvinge, & Ro, 2013).

2.2.3 | Clinical impairment assessment questionnaire

The Clinical impairment assessment (CIA) is a 16-item questionnaire designed to measure the severity of psychosocial impairment associated with EDs (Bohn et al., 2008).

2.2.4 | Symptom Checklist-90-revised

The Symptom Checklist-90-revised (SCL-90-R) is a 90-item questionnaire designed to evaluate a broad range of psychological problems and symptoms of psychopathology on a scale from 0 to 4 points (DeRogatis & Unger, 2010). The items are from nine symptom subscales and they include somatization. Somatization was one of the variables predictive of GI complaints in patients with ED in a previous study (Boyd et al., 2005), and addressed specifically. The SCL-90-R somatization subscale comprises 12 questions about somatic complaints. The "nausea or upset stomach" item was omitted to avoid confounding of the association between GI symptoms and somatization, thereby obtaining a subscore for somatization without GI complaints. Furthermore, the Global Severity Index (GSI) was used to measure the overall psychological distress. To avoid confounding with the somatization subscale in the correlation analyses, a GSI without somatization was calculated that consisted of the remaining 78 items.

2.2.5 | Beck depression inventory-II and Beck anxiety inventory

The Beck depression inventory-II (BDI-II) and Beck anxiety inventory (BAI) are validated 21-item scales for assessing the severity of depressive and anxiety symptoms (Beck, Epstein, Brown, & Steer, 1988; Beck, Steer, & Brown, 1996).

2.3 | Statistics

The associations between symptom scores were assessed using bivariate correlation analyses (Pearson correlation coefficient, *r*). Cohen's standard was used to evaluate the effect size, with $r > 0.5$ indicating a large effect. Multiple regression analysis was used to examine how much of the variance in IBS symptoms was explained by variables that were significantly ($p \leq .05$) correlated with IBS-SSS scores, and the relative contributions of these predictors. The predictors were entered both separately and together in the analyses.

3 | RESULTS

3.1 | Demographic and clinical characteristics

All patients were female, and they were aged 22.3 ± 6.4 years (range 16–38 years) and had a self-reported illness duration of 8.9 ± 7.4 years (range 1–14 years) and a BMI of 15.7 ± 1.7 kg/m^2 (range 13.2–18.2 kg/m^2).

TABLE 1 Severity of IBS symptoms, eating disorder pathology, and psychopathological symptoms in 19 patients with AN prior to starting treatment, and the associations of IBS symptoms with BMI, eating disorder symptoms, and psychopathological measures

	Mean	SD	Range	Percentage of patients with severe symptoms	
IBS-SSS scores over the last 10 days					
Abdominal pain severity (0–100)	40.8	29.6	0–87	31.6[a]	
Abdominal pain frequency (0–100)	54.7	38.2	0–100	52.6[a]	
Abdominal bloating severity (0–100)	50.6	34.7	0–100	42.1[a]	
Interference with daily activities (0–100)	43.11	33.6	0–100	31.6[a]	
Satisfaction with bowel habits (0–100)	50.8	25.6	2–100	26.3[a]	
Total IBS-SSS score (0–500)	237.3	124.3	50–425	38.8[b]	
				Association with IBS-SSS	
				Pearson correlation coefficient	*p*
EDE-Q global score (0–6)	4.0	1.4	1.7–5.7	0.583	**.009**
CIA total score (0–48)	36.5	9.0	15–48	0.128	.601
SCL-90-R (0–4)					
Somatization without GI complaints	1.8	1.1	0.1–3.6	0.666	**.002**
Global severity index without somatization	1.6	0.8	0.5–3.5	0.444	.057
BDI-II total score (0–63)	33.5	13.4	15–60	0.267	.268
BAI total score[c] (0–63)	20.7	15.5	5–62	0.388	.112
BMI (kg/m^2)	15.7	1.7	13.2–18.2	−0.250	.302

Abbreviations: IBS-SSS, Irritable Bowel Syndrome Severity Scoring System; EDE-Q, Eating Disorder Examination Questionnaire; CIA, Clinical Impairment Assessment Questionnaire; SCL-90-R, Symptom Checklist-90-Revised; GI, gastrointestinal; BDI-II, Beck Depression Inventory-II; BAI, Beck Anxiety Inventory; SD, standard deviation.

[a]IBS-SSS item score ≥ 60,

[b]IBS-SSS score ≥ 300,

[c]$n = 18$. The significance level was set to $p < 0.05$.

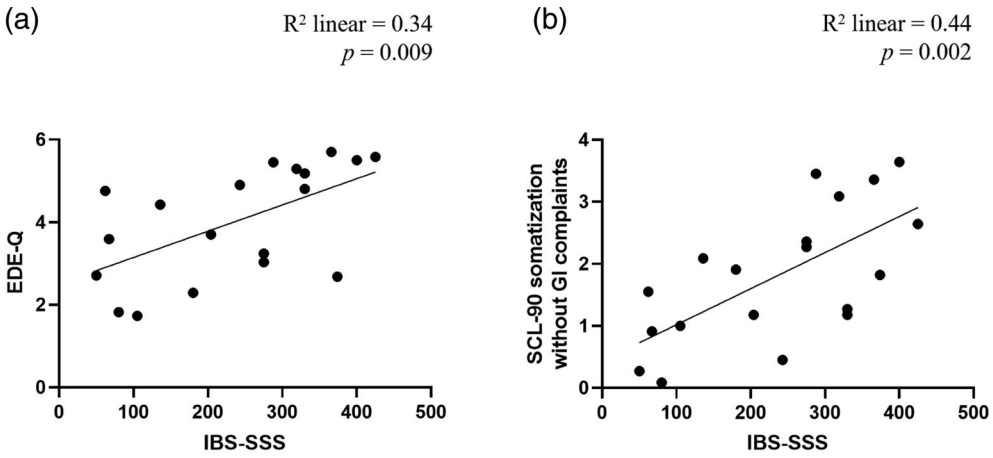

FIGURE 1 Associations of GI complaints (IBS-SSS) with (a) eating disorder pathology [Eating Disorder Examination Questionnaire (EDE-Q)] and (b) somatization (Symptom Checklist-90-Revised [SCL-90-R] somatization subscale without GI complaints) in patients with AN prior to starting treatment

3.2 | Symptom severity

Table 1 lists the severity of IBS symptoms. Three (15.8%), three (15.8%), six (31.6%), and seven patients (38.8%) reported no, mild, moderate, and severe IBS symptoms, respectively. Table 1 indicates that overall the patients had a substantial symptom burden for ED pathology and psychopathological symptoms.

3.3 | Associations of GI complaints with psychopathology, ED symptoms, and BMI

Correlation analyses were performed to assess the associations of GI complaints with psychopathological measures and BMI (Table 1). The severity of IBS symptoms was significantly correlated (with, according to Cohen, large effect size) with ED symptoms (EDE-Q) (r = 0.583, p = .009) and somatization (SCL-90-R somatization subscale without GI complaints) (r = 0.666, p = .002), as shown in Figure 1. GI complaints were not significantly associated with BMI, global psychopathology (GSI without somatization), psychosocial impairment associated with EDs (CIA), or depressive or anxiety symptoms (BDI-II and BAI) (Table 1). In simple linear regression analyses, ED symptoms explained 34% [R^2 = 0.34, F (1,17) = 8.76, p = .009] and somatization explained 44% [R^2 = 0.44, F (1,17) = 13.58, p < .002] of the variance in IBS-SSS scores. Multiple regression analysis was used to assess the relative contributions of ED symptoms (EDE-Q total score) and general somatization (SCL-90-R somatization subscale without GI complaints) to explaining the variance in IBS symptoms. The two independent variables together explained 49% of the total variance [F(2,16) = 7.7, p < .005]. In this model, somatization significantly predicted IBS symptoms (beta = 0.5, p = .04), while ED symptoms did not (beta = 0.27, p = .25).

4 | DISCUSSION

This study assessed the associations of IBS symptoms with psychopathological measures, ED symptoms, and BMI in patients with AN. The severity of GI complaints (IBS-SSS) was strongly correlated with both somatization and ED pathology (EDE-Q global score), while higher IBS-SSS scores were associated with greater severities of other somatic complaints. ED pathology and somatization together explained almost half of the variance in GI complaints. However, while somatization significantly predicted the severity of IBS symptoms in the regression analyses, ED symptoms did not. Furthermore, we found no association between GI complaints and BMI. The highly prevalent symptoms of anxiety and depression were not associated with IBS-SSS scores.

Our results are consistent with the findings of (Boyd et al., 2005) regarding an association between somatization and IBS in patients with ED (Boyd et al., 2005). Those authors assessed the relationships between psychological features, ED pathology, and FGID in 101 patients with ED (45 had AN), and found that somatization and state anxiety were the psychological factors predictive of IBS. In contrast, we found no association between anxiety and IBS-SSS scores.

Previous studies involving non-ED populations suffering from IBS have found a strong symptom overlap with other functional somatic syndromes such as chronic fatigue syndrome, temporomandibular disorder, and fibromyalgia syndrome (Hausteiner-Wiehle & Henningsen, 2014). Also, our findings of a strong association between somatization and IBS symptoms in patients with AN are consistent with the relationships between anxiety, depression, somatization, and the severity of IBS symptoms found in 126 patients with IBS by (Van Oudenhove, Tornblom, Storsrud, Tack, & Simren, 2016). Those authors found that somatization levels were associated with more severe GI symptoms, and (as in our study) this was independent of anxiety but not depression.

Somatization has been defined as the tendency to experience and communicate psychological distress in the form of somatic symptoms (Lipowski, 1988). Thus, the high prevalence of GI complaints in patients with ED could be a manifestation of psychological pathology via bodily expression (Salvioli et al., 2013). Those authors further discussed the possibility of a vicious circle whereby hypochondriatic personality traits perpetuate the experience of GI alterations caused by malnutrition and maintain ED behaviors (Salvioli et al., 2013).

GI symptoms can delay the recovery from AN due to difficulties in increasing food intake. Medical conditions causing GI symptoms during nutritional rehabilitation must be resolved. Our findings suggest that GI complaints could partly be understood as a manifestation of psychological suffering. However, the healthcare provider must understand that GI symptoms are distressing regardless of origin. It is

important to acknowledge the painful nature of nutritional rehabilitation while simultaneously preventing the focus on GI symptoms becoming an avoidance strategy when addressing the pathology underlying the ED. Providing psychoeducation about the GI effects of malnutrition, and about the tendency to focus on bodily symptoms might facilitate the implementation of problem-solving strategies for overcoming these barriers to healthy changes in eating patterns, especially among patients with a somatization tendency.

There were several limitations other than the sample smallness. We used self-report questionnaires instead of clinical assessments, which makes it difficult to conclude that all complaints were functional. Our measure for the GI complaints focused on IBS symptoms, and GI symptoms related to other FGIDs such as PDS were not assessed. The cross-sectional design of the study made it impossible to draw conclusions about the causality of the association between GI complaints and somatization. Furthermore, due to the small sample size, the multiple regression analysis must be interpreted with caution.

In closing, GI complaints are present in a large subgroup of patients with AN and are strongly correlated with other somatic complaints. This indicates that both GI complaints and somatization should be addressed in the treatment of AN in order to prevent these factors constituting a barrier to the establishment of healthy eating patterns.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Ute Kessler https://orcid.org/0000-0002-2002-5518

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