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Importance of trauma-related fear in patients with irritable bowel syndrome and early adverse life events

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Abstract

Background: Although early adverse life events (EALs) are prevalent among patients with irritable bowel syndrome (IBS), the impact of fear or dissociation experienced during the trauma has not been evaluated. We investigated the prevalence of fear at the time of trauma and its association with IBS status among individuals with early life trauma before the age of 18.

Methods: Among participants with 1 EAL, association of Fear and Dissociation with IBS status was determined with logistic regression, and improvement in prediction of IBS over ETI-score alone was determined with the likelihood ratio test. Controlling for age, sex, and IBS status, we then examined the association of each EAL with reported fear.

Key Results: Compared to healthy controls (HCs), IBS subjects reported a higher prevalence of fear (60.4% vs 36.2%, $p < 0.0005$) and dissociation (23.5% vs 13.0%, $p < 0.0005$) at the time of EAL. Fear, but not dissociation, improved prediction of IBS over the total number of EALs (odds ratio 2.00, $p < 0.0001$).

Conclusions & Inferences: This study highlights the importance of EAL-related factors such as fear in addition to the presence or absence of EALs in IBS pathophysiology.

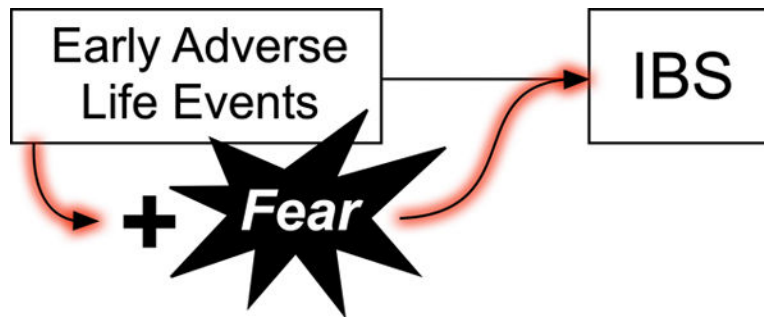
Graphical Abstract

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CONTRIBUTERS: HR and EJV drafted the manuscript. EJV and LC conceptualized the analysis. EJV and WS performed statistical analysis. HR, EJV, AI, BN, AG, EAM and LC interpreted the data and revised the manuscript for important intellectual content. EAM and LC obtained funding.

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Keywords

Adult Survivors of Childhood Adverse Events, Fear; Irritable Bowel Syndrome; Risk Factors; Surveys and Questionnaires

Introduction

Early adverse life events (EALs) are stressful childhood experiences including physical, sexual, or emotional abuse and general trauma.¹ Individuals who have a history of EALs have a higher risk of developing a variety of chronic medical disorders later in life, and are at increased vulnerability toward developing disorders of brain-gut interactions², also known as functional gastrointestinal disorders (FGIDs), such as IBS.³ We and others have previously demonstrated that an increasing number of EALs and perceived severity of EALs are associated with IBS and with greater overall symptom and abdominal pain severity in patients with IBS.³⁻⁵

The Early Trauma Inventory Self Report-Short Form (ETI-SR) is frequently used to measure EALs in IBS. While the ETI-SR yields a score representing the number of EALs, it also assesses for the experience of fear and dissociation (“out-of-body” sensation) at the time of trauma. While we have compared ETI-SR scores in IBS and healthy controls (HCs)³, it is not known if fear or dissociation associated with an EAL further increases the risk IBS status or symptom severity.

The primary aim of this study was to test the hypothesis that among those with a history of EAL, fear or dissociation at the time of the trauma increases the risk of IBS and symptom severity above that of the ETI-SR score (number of traumatic events).

Materials and Methods

Study participants

IBS patients and HCs (> 18 years of age) were drawn from participants recruited for studies conducted at our center between July 2005 and October 2015. IBS subjects were recruited from newspaper or Internet community advertisements and from gastroenterology clinics and fulfilled Rome II (before May 2006) or III (after May 2006) diagnostic criteria.⁶ The diagnosis was confirmed by clinicians with expertise in IBS. HCs recruited by advertisement were without a history of IBS or other chronic gastrointestinal (GI) or pain conditions and

were not taking psychotropic medication or participating in psychotherapy. Subjects were compensated for completion of a medical history, a physical examination and questionnaires.

Early Trauma Inventory Self-Report-Short Form (ETI-SR)

Presence and number of EALs (before age 18) was assessed by the ETI-SR.⁷ The ETI-SR inventories EALs in the following domains (number of items): general trauma (11 items), physical (5 items), emotional (5 items), and sexual abuse (6 items). Each of the 27 items was scored as “Yes”=1 or “No”=0 (total score range 0–27). General trauma includes various stressful and traumatic events, such as a serious accident or death or serious illness of a parent, primary caregiver or friend. Physical punishment is defined as physical contact, constraint or confinement with intent to hurt or injure. Emotional abuse includes events defined by verbal communication with intent to humiliate or degrade and neglect. Sexual abuse is unwanted sexual contact for the gratification of the perpetrator or for the purposes of dominating or degrading the victim. The score for each domain is the sum of its items. The score is not calculated if > 20% of the items in that domain are missing. There is no replacement of missing values, i.e. if >80% of a scale is answered, the score is the sum of answered items.

The ETI-SR also contains the following two items that assess fear (“Did you experience emotions of intense fear, horror or helplessness?”) and dissociation (“Did you experience an out-of-body or dream like sensation?”). These items are prefaced by the following: “If you responded ‘YES’ for any of the above events, answer the following for the one that has had the greatest impact on your life. In answering consider how you felt at the time of the event.” The responses to these questions were used to determine the presence of fear and dissociation at the time of trauma among participants with one or more EAL.

Additional Questionnaires

The Bowel Symptom Questionnaire (BSQ)⁸ measured the presence of IBS and other GI symptoms using Rome questions and IBS symptom severity and pain severity over the past week using a 0 to 20 numeric rating scale (none to most intense imaginable). Current anxiety and depression symptoms were assessed with the Hospital Anxiety and Depression Scale (HADS).⁹ Health-related quality of life (HRQOL) was measured with the Short-Form 12 (SF-12), which includes a Physical Health Composite Scale Score (PCS) and Mental Health Composite Scale Score (MCS).¹⁰ Somatic symptom severity was measured using the Personal Health Questionnaire modified by removal of three items assessing gastrointestinal symptoms (PHQ-12).¹¹ The Visceral Sensitivity Index (VSI) assessed GI-symptom specific anxiety.¹²

Statistical analyses

All statistical analyses were performed using the R software (version 3.4.2).¹³ A p-value <0.05 was used to determine statistical significance. Group differences in demographics and baseline variables were determined with t-tests or Fisher’s exact tests.

Logistic regression was used to test the ability of fear or dissociation to predict group membership for IBS vs. HCs while controlling for age, sex and the sex*fear or sex*dissociation interaction. The interaction with sex was included due to sex differences in IBS and the possibility that the relationship between fear/dissociation and IBS could differ between men and women. Significant associations of fear/dissociation with IBS were further evaluated by the likelihood ratio test to determine whether they resulted in a significant improvement in the ability to predict IBS status over ETI-SR score alone (difference in model fit of age+sex+ETI-SR Total Score vs. age+sex+ETI-SR Total Score+fear/dissociation).

Linear regression controlling for age and sex was used to compare the following in those with vs. without fear/dissociation; IBS symptom severity, anxiety and depression, HRQOL, GI-specific anxiety and somatic symptom severity. P-values were adjusted using the Benjamini-Hochberg method.

Logistic regression was used to determine univariate and multivariate associations between ETI-SR items and fear controlling for age, sex, and IBS status. Due to the low prevalence of some sexual abuse events, responses to similar questions were pooled. Pooled items are indicated in Table 4. We also checked IBS*ETI-SR item interaction effects.

Results

Participant characteristics

A flowchart depicting sample selection for the analyses is shown in Figure 1. There were 1,032 unique participants who completed the ETI-SR, of whom 729 individuals' responses had previously been analyzed by us to assess prevalence of various types of EALs among IBS patients.³ 862 (84%) reported 1 EAL. Fear and dissociation at the time of the EAL were evaluated in the subset of this sample with 1 EAL who answered the questions about fear and dissociation (n=824, Table 1). This sample included 369 IBS patients and 445 HCs (76.9% and 69.9% women). All participants in this set had valid data for fear ("Fear sample") but six did not respond to the dissociation question. The analysis sample was similar to the overall sample (n=1,032) in distribution by sex and ethnicity but was older (mean age (SD) 32.2 (11.6) vs 29.6 (10.7) years, $p<0.005$), had a lower proportion of Asian participants ($p<0.005$) and had decreased physical and mental HRQOL and higher scores for all other measures (IBS symptoms, anxiety, depression, somatic symptom severity, GI-specific anxiety, $p<0.005$ for all) as expected since the sample with EALs had a greater proportion of IBS patients ($p=0.010$).

Prevalence of fear and dissociation at the time of EAL

In agreement with our previous findings,³ ETI-SR scores for the total scale and the four subscales were higher in IBS compared to HCs (mean (SD) for the total scale: 6.13 (5.26) in IBS and 3.88 (4.04) in HCs, $p<0.005$). Both fear and dissociation were more frequently reported by IBS patients in comparison to HCs (60.4% vs 36.2%, $p<0.005$ and 23.5% vs 13.0%, $p<0.005$, respectively, Figure 2). Fear was reported more frequently by women than

men (50% vs 41%, $p=0.023$), while dissociation was reported by 17.6% of both women ($n=105$ of 596) and men ($n=39$ of 222).

Effect of fear/dissociation at time of EAL on IBS status

Among participants with 1 EAL, fear and dissociation were significant predictors of IBS after controlling for age and sex ($p<0.005$). The fear*sex interaction effect was non-significant indicating a similar effect of fear on IBS in men and women. In contrast, there was a significant dissociation*sex interaction effect on IBS ($p=0.020$). Separate analyses in men ($n=222$) and women ($n=602$) revealed a significant effect in women ($p<0.005$) but not in men. Controlling for age and sex, the total ETI-SR score was a significant predictor of IBS status, in line with previous findings.³ Fear improved prediction of IBS status beyond the total ETI-SR score (Table 2). When fear was added to the model, the overall model fit was improved ($p<0.005$) indicating that fear at the time of EAL accounted for additional risk of IBS. The effect of dissociation was not significant after controlling for age, sex and total ETI-SR ($p=0.10$) and did not improve the model fit ($p=0.10$). Among women, however, there was a significant effect of dissociation controlling for age and total ETI-SR and dissociation did improve model fit ($p=0.011$ for both). Since fear was more common than dissociation, we focused additional analyses on fear.

Clinical characteristics associated with fear at time of EAL (Table 3)

Within IBS, those with vs. without fear at the time of EAL had increased anxiety symptoms and decreased mental HRQOL (SF-12-MCS, $p<0.005$ for both). Those reporting fear had numerically increased depression symptom scores and somatic symptom severity, but differences were not statistically significant ($p=0.077$, $p=0.096$, respectively). Fear was not significantly associated with current abdominal pain severity in IBS after adjusting for multiple comparisons ($p=0.14$, unadjusted $p=0.04$), and was not associated with GI-symptom related anxiety (VSI, $p=1$). Decreased mental HRQOL (SF-12-MCS, $p=0.008$), increased anxiety ($p<0.005$), and increased depression ($p=0.013$) were also associated with fear among HCs. There was no significant association of fear and physical HRQOL (SF-12 PCS) in IBS and HCs ($p=1$ for both).

Association of individual EALs with fear

Although our data does not include which specific EALs were remembered as fearful, we were interested in addressing this question. When respondents specify whether they experienced fear with an EAL, they are instructed to consider the EAL that has had the greatest impact on their life and to consider how they felt at the time of the event. The proportion of participants with fear who also endorsed the individual EAL inventoried in the ETI-SR is shown in Figure 3. The univariate and multivariate associations between each ETI-SR item and reported fear (controlling for age, sex, and IBS status) are shown in Table 4. The only EAL for which there was a IBS interaction effect on fear was the presence of mental illness in a family member. When analyzed in IBS and HCs separately, this item was highly associated with fear in IBS (OR=4.1, $p<0.005$) while there was a non-significant association in HCs (OR=1.6, $p=0.06$).

Discussion

Key findings

Our analysis demonstrated that fear at the time of the EAL adds to the risk of IBS associated with the number of EALs (ETI-SR score) and is associated with increased current anxiety symptoms and poorer mental HRQOL. The effect on anxiety and HRQOL was present in both IBS patients and HCs though the effect size was larger in IBS.

Fear as a potential indicator of EAL “severity”

A history of EALs is a known risk factor for IBS.^{3,4,14,15} This has mostly been shown using measures that reflect the number of EALs experienced.^{3,4,14} Our finding that fear at the time of EAL increased the risk of IBS over the number of EALs suggests a potential role for additional EAL-related factors in IBS pathophysiology. Fear at the time of the EAL may indicate increased perceived severity. Among those with EALs, increased perceived severity is associated with an increased risk for IBS.⁵

It is possible that a more severe EAL is more likely to result in neurophysiological changes that may predispose to IBS. While the underlying mechanism linking EALs to IBS is incompletely understood, studies in humans and animal models have linked early life adversity to alterations in stress responsiveness, such as changes in the hypothalamic pituitary adrenal (HPA) axis^{16–18} and heightened acoustic startle response to unpredictable abdominal threat,¹⁹ as well as greater activation in regions associated with emotional processing in response to anticipated aversive rectal distensions²⁰ or pain.²¹

Previous studies have demonstrated EAL-related alterations in the connectivity of the emotional regulation circuitry in response to both visceral and emotional stimuli in IBS patients.^{22–24} This suggests that an increased number of EALs may lead to reduced cortical modulation of emotional arousal that is present in IBS patients during adulthood.²⁵ In addition, neuroimaging studies have suggested that the presence of EALs can lead to impairments in the ability of IBS patients to detect, process and modulate sensory information, decrease cognitive modulation and flexibility functions, and decrease the ability to generate appropriate autonomic behavioral responses.^{26–29} Fear could also be a surrogate marker of underlying factors moderating an individual’s response to stressful events, such as alterations in fear learning which have been seen in IBS.^{19,21}

Dissociation at the time of the EAL

While dissociation was more frequently reported by IBS patients versus HCs, dissociation as an item was not reported as frequently as fear (60.4% IBS patients reported fear whereas only 23.5% reported dissociation). The presence of dissociation did not further increase the odds of having IBS over the number of EALs. While there is a strong association between sexual abuse and dissociation,³⁰ the frequency of sexual abuse was relatively low which may explain the lack of significant impact of dissociation on IBS status in this sample.

Association of specific EALs with fear

There is no definitive evidence in the literature regarding which traumas in particular predispose an individual to peritraumatic fear; however, there is evidence that factors such as tonic immobility and a sensation of inescapability at the time of trauma, may mediate the relation of peritraumatic fear and reexperiencing symptoms among sexual assault survivors.³¹ Furthermore, among patients with post-traumatic stress disorder (PTSD), it has been demonstrated that unpredictability of the trauma and hormone levels (i.e., low estrogen levels) at the time of the trauma predispose an individual to a heightened fear response.³²

Most EALs that were more frequent among participants with vs. without fear involved threat of harm to oneself or loved one (personal injury or illness, witnessing violence) or were sexual events. Being “put down or ridiculed” was also associated with fear in both IBS and HCs. This could represent fear associated with chronic adversity (emotional abuse, bullying); however, we do not know whether this item itself was associated with fear. Positive relationships with family and peers is a key factor in resilience during adolescence.³³ It is possible that the presence of emotional abuse is a marker for other factors influencing the experience and memory of adverse events. For example, participants who were “put down or ridiculed” may be less likely to have someone to confide in, which is protective against development of IBS among those with EALs.⁵ Social support is also associated with decreased symptom severity in IBS.³⁴

The presence of a mental illness in a family member was strongly associated with fear in IBS but not HCs (IBS interaction effect). The connection between mental illness in the family and IBS has been shown consistently in studies from our group and others.^{3,4,35} Our finding that mental illness in the family was associated with fear specifically in IBS is thought-provoking and highlights the importance of early environment in IBS pathogenesis. A role for family environment is supported by studies of familial aggregation³⁶ and studies showing that the parental response to a child’s abdominal pain^{37–39} as well as parenting style⁴⁰ may influence IBS onset. Future research could determine whether the types and severity of mental illness in the family differ in IBS and HCs.

Limitations

The most important potential limitation to the interpretation of our data is recall bias involved in patient reported fear at the time of an EAL and in reporting EALs in general. Our results show (Table 3) that subjects reporting fear at time of the EAL (vs those who did not report fear) had greater anxiety and depression symptoms and poorer mental HRQOL. This was true for both IBS and HCs, although psychological symptoms and mental HRQOL were overall worse in IBS. Current emotional state is known to affect memory recall, with most studies showing mood-congruent recall bias (e.g. better recall of threat related themes in those with anxiety);^{41,42} however, the possibility of bias related to current mood is likely to be less when applies to autobiographical memory.⁴³ Another limitation is that we did not measure physiological stress responses in this study, and therefore do not know if whether stress hyperresponsiveness is associated with fear at the time of an EAL. Another limitation is that our findings may not be applicable to other patient populations, as our participants were predominantly recruited from the community and were relatively young (mean age 35);

however, a younger population may have better recollection of events in childhood. In addition, many of the studies for which they were recruited excluded patients with active comorbid psychiatric disease. Finally, our analysis of individual items associated with fear should be interpreted with caution as most participants had more than one EAL and we do not know which EAL was associated with fear. An analysis of participants with only one EAL (n=119, 14%) is limited both by sample size and potential selection bias as some of items on the ETI-SR are quite common (e.g. divorce).

In summary, our findings, taken together with our previous studies, support that a number of EAL-related factors impact the risk of having IBS. In addition, we now demonstrate that among individuals with a history of one or more EAL, reported fear at the time of an EAL contributes to the prediction of IBS status beyond the ETI-SR total score and negatively impacts symptoms and HRQOL. Identifying patients with a history of EALs in IBS can be important because it both increases patient insight into their disease and helps guide the healthcare provider in formulating an integrative therapeutic approach.

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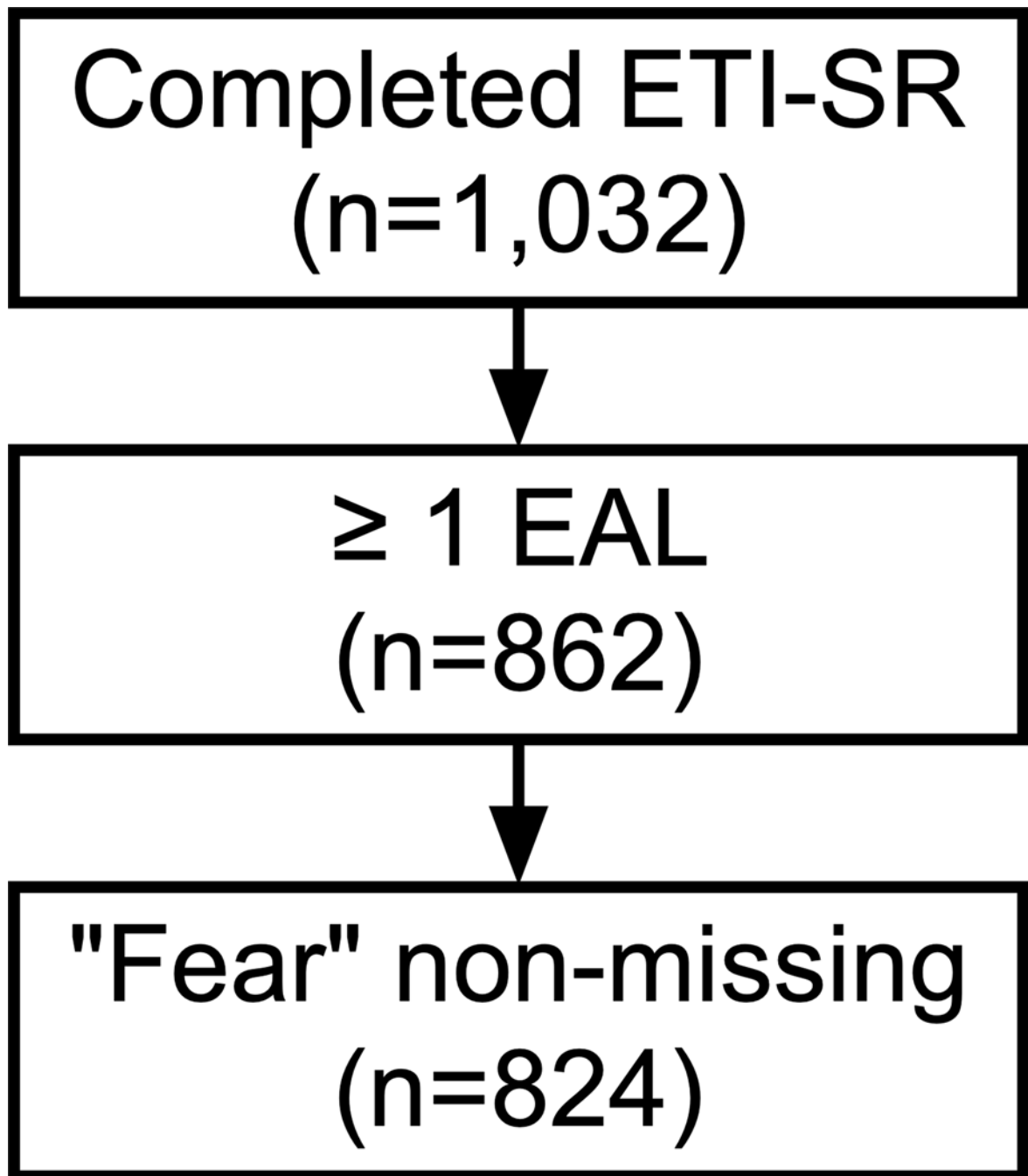


Figure 1:
Diagram of samples used in study.
ETI-SR, Early Trauma Inventory Self Report-Short Form; EAL, early adverse life event.

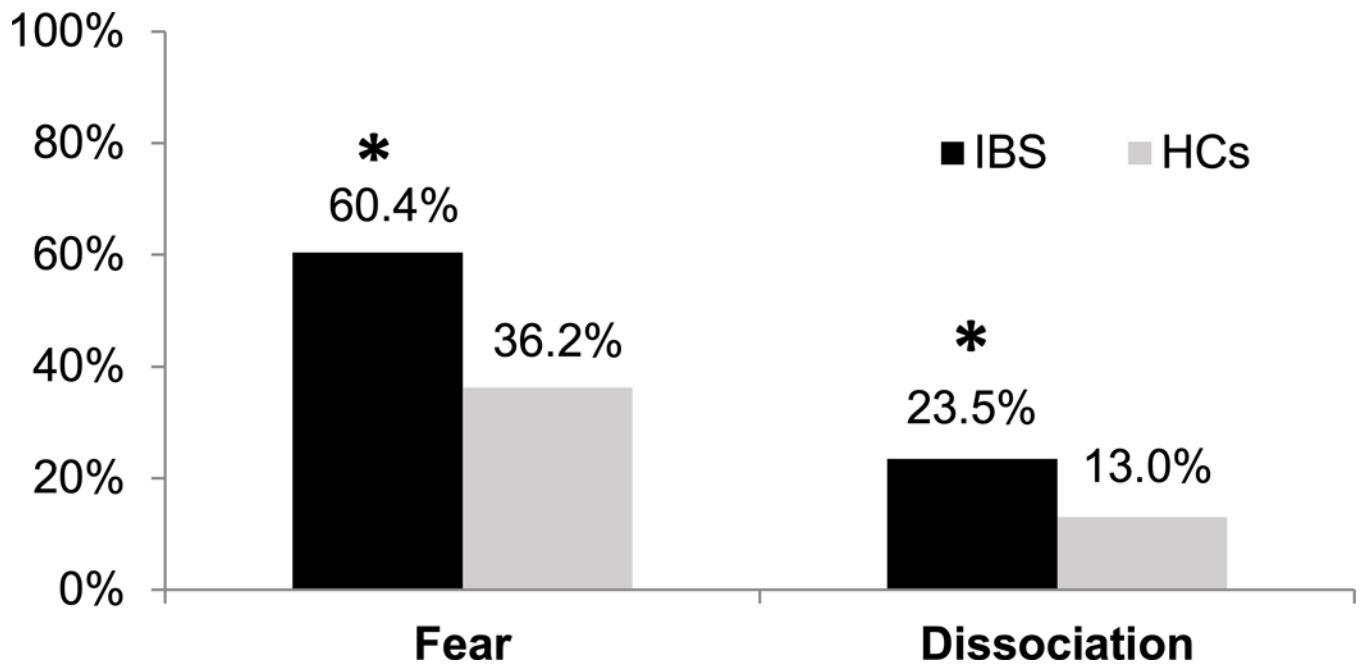


Figure 2:
Prevalence of peritraumatic fear and dissociation in IBS patients (black) versus HC (gray).
*p value <0.0005 for IBS participants versus HC.
ETI-SR, Early Trauma Inventory Self Report-Short Form; IBS, irritable bowel syndrome;
HC, healthy control; EAL, early adverse life event.

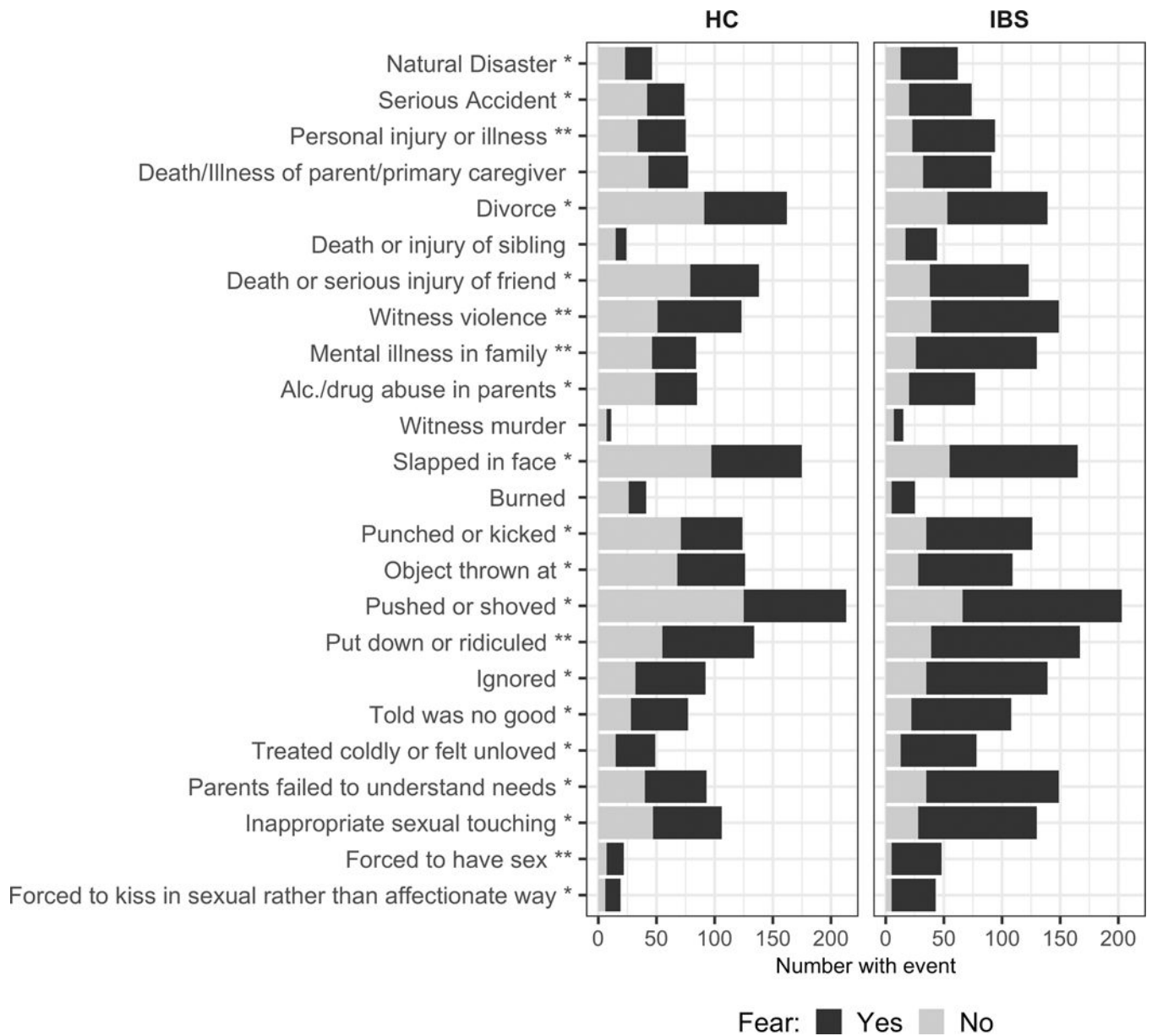


Figure 3: Frequency of specific items by IBS status and presence of fear at the time of trauma. Bars show the total number with each event (total) and the numbers who answered “yes” (black) “no” (grey) to the item addressing fear at the time of trauma. Participants did not identify specific items associated with fear (plot does not indicate fear associated with specific events). “Inappropriate sexual touching” and “Forced to have sex” combine answers to several items (see Table 4). * and ** indicate significant association of event with fear in univariate and multivariate analyses. IBS, irritable bowel syndrome; HC, healthy control; Alc, alcohol

Table 1:

Participant characteristics

	IBS	HCs
N (% women)	369 (77%)	455 (70%)
Mean Age (SD)	34.4 (12.0) ^I	30.4 (10.9)
Bowel Habit Subtype (%)	IBS-C	112 (30%)
	IBS-D	117 (32%)
	IBS-M	92 (25%)
	IBS-U	48 (13%)
Race (%)		
Hispanic	74 (20.1%)	104 (22.9%)
Asian	50 (13.6%)	122 (26.8%) ^I
Black	54 (14.6%)	77 (16.9%)
White	223 (60.4%)	205 (45.1%) ^I
Other	53 (14.4%)	69 (15.2%)
HAD Anxiety (0–21)	8.0 (4.3) ^I	4.1 (2.9)
HAD Depression (0–21)	4.0 (3.2) ^I	1.7 (2.0)
SF-12 Physical Composite Score	48.2 (8.9)	55.1 (4.3) ^I
SF-12 Mental Composite Score	44.0 (11)	53.0 (7.3) ^I
General Trauma Score (0–11)	2.7 (2.1) ^I	2.0 (1.7)
Physical Punishment Score (0–5)	1.7 (1.6)	1.5 (1.5)
Emotional Abuse Score (0–5)	1.7 (1.8) ^I	1.0 (1.5)
Sexual Abuse Score (0–6)	0.9 (1.6) ^I	0.5 (1.1)
Total ETI-SR Score (0–27)	7.0 (5.1) ^I	4.9 (4.0)

^I p<0.05, IBS vs HC. IBS, irritable bowel syndrome; HCs, healthy controls; IBS-C, IBS with constipation; IBS-D, IBS with diarrhea; IBS-A, alternating type IBS; IBS-U, unsubtyped IBS; IBS-M, mixed-type IBS; EALs, early adverse life events, HAD, Hospital Anxiety and Depression Scale; SF-12, Short Form-12; ETI-SR, Early Trauma Inventory Self Report-Short Form. Numbers in parentheses indicate standard deviation values except where noted.

Table 2:

Association of peritraumatic fear with IBS status

Model	IBS~Age+Sex+ETI-SR Total Score	IBS~Age+Sex+ETI-SR Total Score+Fear
Variable	OR (95%CI)	OR (95%CI)
Age	1.03 (1.01, 1.04) **	1.03 (1.02, 1.04) **
Sex (Women vs Men)	1.76 (1.27, 2.47) **	1.62 (1.16, 2.28) *
ETI-SR Total Score	1.10 (1.06, 1.14) **	1.06 (1.02, 1.10) **
Peritraumatic Fear	—	2.07 (1.51, 2.84) **

* p=0.005,

** p<0.001; n=813; IBS, irritable bowel syndrome; ETI, Early Trauma Inventory Self Report-Short Form; OR, odds ratio; CI, confidence interval.

Table 3:

Comparison of IBS participants with and without peritraumatic fear

Group	IBS				HCs			
	Yes (n=223)	No (n=146)	p	p (adj.)	Yes (n=165)	No (n=290)	p	p (adj.)
Fear								
Men/Women (n)	43/180	42/104	0.043	0.66	47/118	90/200	0.6	1.0
Overall Symptom Severity (0–20)	10.7 (4.1)	10.4 (4.4)	0.67	1.0	—	—	—	—
Abdominal Pain Severity (0–20)	10 (4.6)	8.9 (4.8)	0.044	0.14	—	—	—	—
HAD Anxiety (0–21)	8.9 (4.3)*	6.7 (4.1)	<0.001	<0.001	4.8* (3.1)	3.7 (2.8)	<0.001	0.002
HAD Depression (0–21)	4.4 (3.4)	3.5 (2.9)	0.014	0.077	2.0* (2.4)	1.4 (1.7)	0.002	0.013
Health-related QOL/SF12	48 (9.3)	48.6 (8.5)	0.81	1.0	55 (5.3)	53.2 (3.6)	0.72	1.0
	42 (11.1)*	47 (10.2)	<0.001	<0.001	51.6* (7.8)	53.7 (6.9)	0.004	0.022
Somatization/PHQ-12 (0–24)	6.8 (4.1)	5.6 (3.8)	0.024	0.096	2.3* (2.1)	1.9 (1.7)	0.014	0.057
GI-specific Anxiety/VSI (0–75)	37.4 (17)	37.9 (16.2)	0.77	1.0	—	—	0.18	0.58

p-values were adjusted using the Benjamini-Hochberg method for n=16 comparisons. performed with Fisher's exact test and comparison of continuous variables with linear regression controlling for age and sex.

IBS, irritable bowel syndrome; HCs, healthy controls; Adj., adjusted; HAD, Hospital Anxiety and Depression Scale; QOL, quality of life; PCS, Physical Composite Score; MCS, Mental Composite Score; PHQ-12, Patient Health Questionnaire-12; VSI, Visceral Sensitivity Index.

* Denotes statistical significance.

Table 4:

Association of ETL-SR items with fear

Item	N with EAL (% within Fear/No Fear)		Univariate		Multivariate	
	Fear (n=388)	No Fear (n=436)	OR	p*	OR	p
Were you ever exposed to a life-threatening natural disaster?	72 (18.6)	36 (8.3)	2.4	<0.005	1.6	0.067
Were you involved in a serious accident?	86 (22.2)	62 (14.3)	1.7	0.006	1.0	0.962
Did you ever suffer a serious personal injury or illness?	112 (28.9)	57 (13.2)	2.5	<0.005	1.9	0.004
Did you ever experience the death or serious illness of a parent or a primary caretaker?	93 (24)	75 (17.3)	1.4	0.104	1.2	0.401
Did you experience the divorce or separation of your parents?	157 (40.5)	144 (33.2)	1.4	0.041	0.9	0.494
Did you experience the death or serious injury of a sibling?	36 (9.3)	32 (7.4)	1.0	0.871	0.6	0.108
Did you ever experience the death or serious injury of a friend?	144 (37.2)	117 (26.9)	1.7	0.002	1.3	0.141
Did you ever witness violence towards others, including family members?	182 (47.3)	90 (21.1)	3.2	<0.005	1.8	0.007
Did anyone in your family ever suffer from mental or psychiatric illness or have a “breakdown”? ****	142 (36.8)	72 (16.5)	2.5	<0.005	1.8	0.003
Did your parents or primary caretaker have a problem with alcoholism or drug abuse?	93 (24.1)	69 (15.8)	1.7	0.006	1.1	0.576
Did you ever see someone murdered?	12 (3.1)	14 (3.2)	0.9	0.871	0.4	0.122
Were you ever slapped in the face with an open hand?	188 (48.8)	152 (34.9)	1.8	<0.005	1.0	0.827
Were you ever burned with hot water, a cigarette or something else?	35 (9.1)	31 (7.1)	1.6	0.106	1.0	0.982
Were you ever punched or kicked?	144 (37.4)	106 (24.5)	2.0	<0.005	0.9	0.773
Were you ever hit with an object that was thrown at you?	139 (35.9)	96 (22.1)	2.2	<0.005	1.1	0.603
Were you ever pushed or shoved?	225 (58.3)	191 (44)	1.8	<0.005	0.9	0.743
Were you often put down or ridiculed?	207 (53.4)	94 (21.6)	4.0	<0.005	1.8	0.010
Were you often ignored or made to feel that you didn't count?	164 (42.4)	67 (15.4)	3.7	<0.005	1.6	0.063
Were you often told you were no good?	135 (34.9)	50 (11.5)	4.0	<0.005	0.9	0.835
Most of the time were you treated in a cold, uncaring way or made to feel like you were not loved?	99 (25.6)	28 (6.4)	4.7	<0.005	1.1	0.792
Did your parents or caretakers often fail to understand you or your needs?	167 (43)	75 (17.2)	3.3	<0.005	1.3	0.202
Were you ever touched in an intimate or private part of your body (e.g breast, thighs, genitals) in a way that surprised you or made you feel uncomfortable? Did you ever experience someone rubbing their genitals against you? Were you ever forced or coerced to touch another person in an intimate or private part of their body? **	161 (41.8)	75 (17.2)	3.1	<0.005	1.6	0.026
Did anyone ever have genital sex with you against your will? Were you ever forced or coerced to perform oral sex on someone against your will? **	58 (15.2)	12 (2.8)	5.3	<0.005	3.1	0.009

Item	N with EAL (% within Fear/No Fear)		Univariate		Multivariate	
	Fear (n=388)	No Fear (n=436)	OR	p*	OR	p
Were you ever forced or coerced to kiss someone in a sexual rather than an affectionate way?	51 (13.2)	11 (2.5)	4.8	<0.005	1.5	0.376

Multivariate predictors of fear are in bold text.

* adjusted for multiple comparisons (Benjamini-Hochberg);

**, items pooled for analysis;

***, effect in IBS only (OR 4, p<0.005). In the "Fear" and "No Fear" columns, first number refers to mean number of responses while second number in parentheses refers to standard deviation of responses.