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ORIGINAL RESEARCH

Prevalence of depression and anxiety in people with inflammatory bowel disease and associated healthcare use: population-based cohort study

Peter Irving [1,2] Kevin Barrett,[3] Monica Nijher,[4] Simon de Lusignan [5,6]

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[1]Department of Gastroenterology, Guy's and Saint Thomas' Hospital, London, UK
[2]School of Immunology and Microbial Sciences, King's College London, London, UK
[3]New Road Surgery, Croxley Green, UK
[4]Inflammation and Immunology, Pfizer, Tadworth, UK
[5]Nuffield Department of Primary Care Health Sciences, University of Oxford, Oxford, UK
[6]Royal College of General Practitioners (RCGP) Research and Surveillance Centre (RSC), London, UK

Correspondence to
Dr Peter Irving, Department of Gastroenterology, 1st Floor College House, South Wing, St Thomas' Hospital, London SE1 7EH, UK; peter.irving@gstt.nhs.uk

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ABSTRACT

Background Inflammatory bowel disease (IBD) has a significant impact on quality of life for many people.

Objective To assess the prevalence of common mental health conditions in IBD and the combined impact of IBD and mental health conditions on healthcare use and time off work.

Methods A UK population-based primary care database (Royal College of General Practitioners Research and Surveillance Centre) was used to identify adults with IBD (n=19 011) (Crohn's disease (CD) or ulcerative colitis (UC)), and matched controls (n=76 044). Prevalences of anxiety, depressive episodes and depressive disorder recorded in primary care were assessed between 2016 and 2018. Outcomes comprised of rates of primary care visits, emergency secondary care visits, certificates for time off work, antidepressant and anxiolytic prescriptions.

Findings Mental health conditions were more common in people with CD than controls: anxiety episodes (3.5% vs 3.0%; p=0.02), depressive episodes (5.7% vs 4.1%; p<0.001) and depressive disorder (17.5% vs 12.9%; p<0.001), and people with UC versus controls: depressive episodes (4.4% vs 3.6%; p<0.001) and depressive disorder (14.2% vs 12.4%; p<0.001). Healthcare utilisation rates were higher in people with IBD than controls (primary care visits incidence rate ratio 1.47 (95% CI 1.43 to 1.51); emergency secondary care visits 1.87 (1.79 to 1.95); fitness for work certificates 1.53 (1.44 to 1.62); antidepressant use 1.22 (1.13 to 1.32); anxiolytic use 1.20 (1.01 to 1.41)). In people with IBD, mental health conditions were associated with additional increases in healthcare use and time off work.

Conclusion Depression and anxiety are more common in people with IBD than matched controls. Healthcare utilisation and prescribing of psychotropic medications are also higher in people with IBD. Mental health conditions in people with IBD are associated with additional healthcare use and time off work.

Clinical implications Evidence-based mental health support programmes, including psychological treatments, are needed for people with IBD.

BACKGROUND

Ulcerative colitis (UC) and Crohn's disease (CD) are chronic inflammatory conditions collectively termed inflammatory bowel disease (IBD). Both UC and CD can follow a relapsing-remitting path or can be continuously active, with symptoms ranging from quiescent to potentially fatal.[1] For many people, IBD represents a lifelong burden of medical and surgical intervention.[1]

Despite increasing treatment options, quality of life remains significantly reduced in people with IBD.[2] IBD can have a negative effect on interpersonal relationships, life activities, social participation and mental well-being; and although most people with IBD maintain long-term employment after diagnosis, IBD is associated with greater unemployment and sick leave compared with healthy controls.[3–5] The prevalence of mental health conditions such as depression and anxiety is reported to be higher in people with IBD compared with general populations.[6–9] However, for most studies of mental health and IBD, outcomes are based on self-reported measures, rather than formal diagnoses of mental health conditions.[8]

Given the fact that IBD is a chronic, incurable condition often requiring prolonged treatment, it is important for all healthcare partners, ranging from clinicians to service commissioners, to have a good understanding of the total healthcare utilisation of people with IBD. Existing studies have focused on cohorts based on secondary care, meaning little is known about healthcare resource utilisation in UK primary care in people with IBD. Similarly, little is known about the combined impact of mental illness and IBD on healthcare use.

Objective

Using a primary care cohort, we set out to describe the prevalence of three common mental health conditions in adults with UC and CD when compared with a matched cohort without IBD. We examined three groups of common mental conditions as defined by the International Statistical Classification of Diseases and Related Health Problems 10th Revision classification:[10] depressive episodes (F32), recurrent depressive disorder (F33) and non-phobia-related anxiety disorders (F41). We also explored the associations between these mental health conditions and healthcare use in people with IBD, including primary care visit rates, hospital attendances and prescribing rates.

METHODS

Study design

The study was preregistered as an observational study on ClinicalTrials.gov (NCT03836612), and

the full protocol and statistical analysis plan have been previously published.[11] Using a large English population-based primary care database, the Oxford-Royal College of General Practitioners (RCGP) Research and Surveillance Centre (RSC) database, we performed a retrospective matched study to (1) compare the prevalence of common mental health conditions in people with IBD compared with a matched population without IBD; (2) explore the association of mental health conditions with healthcare utilisation measures such as healthcare visits and issues of statements of fitness for work (for any reason) in adults with IBD compared with a matched population. The study covered a 3-year period: 1 January 2016–1 January 2019.

Data source

The RCGP RSC database contains the pseudonymised primary care records of the registered population from a network of general practitioner (GP) practices, providing a broadly representative sample of the UK population.[12] The database contains complete data on all events and clinical entities coded in UK primary care. These include demographic information, clinical diagnoses, laboratory test results, primary care-issued prescriptions, process of care codes (e.g. specialist referrals and recorded emergency secondary care attendances) and anthropometric measurements (e.g. body mass index (BMI)), coded using the Read coding system.[13]

UK general practice records provide several advantages for this study type:[14] in the UK primary care is a registration-based system, a patient can only register with a single GP at a time, and a patient's unique National Health Service number ensures GP to GP record transfer when moving practice, as well as reliable recording of death. GPs act as the gatekeeper to secondary care, meaning referrals are almost universally made from primary care to secondary care so even patients engaged primarily with secondary care will be captured. Furthermore, records have been computerised since the 1990s, and pay-for-performance targets (introduced in 2004 through The Quality and Outcomes Framework) have resulted in consistent high-quality clinical data entry about chronic disease. Studies using the RCGP RSC data have been published across a range of chronic diseases, including IBD.[15–18]

Study population and outcome measures

All adults (aged ≥18 years) registered with a GP practice for at least 1 year and contributing to the RCGP RSC during the study period were eligible for inclusion. To minimise the impact of 'ghost' patients, we also required each individual to have at least one consultation over the study period.

Definition of the IBD cohort

All individuals with an existing or incident diagnosis of UC or CD over the study period were eligible for inclusion in the IBD cohort. The use of diagnostic codes to identify IBD from UK primary care records has been validated and shown to be accurate and to correctly differentiate between UC and CD.[19]

Read code lists used to identify UC and CD are reported in online supplemental table 1, and were based on validated UK code lists[11 19] and mapped to both Read code versions used within the RCGP RSC network. The use of diagnostic codes to identify IBD has also been shown to have good validity in US claims databases.[20] Start of follow-up for an individual with IBD was defined as the latest of 1 January 2016 (if the individual had an existing diagnosis prior to the study period), or the date of diagnosis of IBD (if the individual had an incident diagnosis during the study period).

Definition of the matched cohort

People with a diagnosis of IBD were matched at their index date (the start of follow-up date) with four unexposed individuals at general practice level by current age, sex and time since practice registration (individual nearest neighbour matching, with replacement). The eligible pool of unexposed individuals at each index date comprised of individuals actively registered at that date with no history of IBD and at least 1 year of follow-up in RCGP RSC (to minimise the risk they had a non-recorded existing diagnosis of IBD). Follow-up for each matched control started on the index date of their matched case with IBD. People with a diagnosis of IBD after the study start date were included in the pool of eligible unexposed individuals, but if matched, were excluded from the study from the date they were diagnosed with IBD.

Mental health outcomes

The presence of mental health conditions at baseline (study start date) was determined for people with and without IBD. The three mental health conditions (depressive episodes, recurrent depressive disorder and non-phobia-related anxiety disorder) were chosen as they represent the most common mental health conditions presenting to primary care.[21] These conditions were identified using algorithms validated in UK primary care[22] and selected to optimise the positive and negative predictive value. In brief, for depressive episodes we used a diagnostic code for depression and concurrent treatment for depression (selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants, monoamine oxidase inhibitors, counselling, cognitive–behavioural therapy (CBT), psychotherapy), for anxiety episodes we used a diagnostic code for anxiety and concurrent treatment for anxiety (SSRIs, anxiolytics, counselling, CBT and psychotherapy), and for depressive disorder either a historical code for any depression and current treatment for depression (as above) or a recurrent depressive disorder-specific diagnosis code.[11] The diagnostic algorithm and full code lists are reported in online supplemental tables 2–6.

Healthcare utilisation measures

The primary measures of healthcare utilisation comprised of: the number of primary care attendances, emergency secondary care attendances recorded in the primary care record and issue of statements of fitness for work (indicating absenteeism from work due to ill health, also termed fit notes or sick notes). Emergency secondary care attendances were defined as emergency admissions to hospital for any reason or attendances at the emergency department (accident and emergency), as recorded in the primary care record (no linkage to secondary care records themselves was available for this study). Statements of fitness for work are issued to patients to provide to their employers as evidence of being medically unable to perform usual work activities, and thus indicate absenteeism. UK primary care records have previously been used to identify statements of fitness for work.[23]

We also evaluated the number of primary care prescriptions for antidepressant and anxiolytic medications, and, in the IBD cohort only, the number of primary care prescriptions for IBD-related medications. Antidepressant medications examined comprised of SSRIs and related medications (serotonin and norepinephrine reuptake inhibitors). Anxiolytic medications

examined comprised of all benzodiazepines and other related medications indicated for use in anxiety states (online supplemental table 7). Examined medications used for the treatment of IBD comprised of: rectal 5-aminosalicylic acid (5-ASA) medications, rectal glucocorticoids, oral 5-ASA medications, oral glucocorticoids, non-biological immunomodulators (cyclosporine, azathioprine, mercaptopurine, methotrexate or tacrolimus) and biological therapies (online supplemental table 7).

Other baseline measures

Socioeconomic status was defined using the official national measure, the Index of Multiple Deprivation (IMD). This was calculated at the point of data extraction, using patient postcode, with the resultant scores stratified by deprivation quintile. BMI was defined as the most recently recorded measurement prior to the study start date. Smoking status was defined using the most recently recorded data prior to the study start date. Diagnostic codes were used to define

Table 1 Demographic and clinical characteristics at baseline in people with inflammatory bowel disease (IBD) and population controls; values are n (%) unless otherwise stated

	All IBD n=**19 011**	Ulcerative colitis n=**11 454**	Crohn's disease n=**7557**	Controls N=**76 044**
Age group				
18–29	2276 (12.0)	1198 (15.9)	1078 (9.4)	9407 (12.4)
30–39	3036 (16.0)	1338 (17.7)	1698 (14.8)	11 931 (15.7)
40–49	3379 (17.8)	1450 (19.2)	1929 (16.8)	13 593 (17.9)
50–59	3560 (18.7)	1405 (18.6)	2155 (18.8)	14 305 (18.8)
60–69	3235 (17.0)	1152 (15.2)	2083 (18.2)	12 890 (17.0)
70–79	2278 (12.0)	682 (9.0)	1596 (13.9)	8942 (11.8)
80+	1247 (6.6)	332 (4.4)	915 (8.0)	4967 (6.5)
Sex				
Male	9043 (48)	3379 (45)	5664 (49)	36 298 (48)
Female	9968 (52)	4178 (55)	5790 (51)	39 746 (52)
Mean time since registration, years (SD)	15.0 (13.6)	14.7 (13.2)	15.3 (13.8)	14.8 (13.4)
Smoking status				
Non-smoker	6827 (35.9)	2612 (34.6)	4215 (36.8)	30 277 (39.8)
Current smoker	2848 (15.0)	1580 (20.9)	1268 (11.1)	14 088 (18.5)
Ex-smoker	9139 (48.1)	3271 (43.3)	5868 (51.2)	30 425 (40.0)
Not recorded	197 (1.0)	94 (1.2)	103 (0.9)	1254 (1.6)
BMI (kg/m^2)				
Underweight (≤18.5)	7229 (38.0)	2992 (39.6)	4237 (37.0)	24 690 (32.5)
Normal weight (18.5–25)	639 (3.4)	363 (4.8)	276 (2.4)	1814 (2.4)
Overweight (25–30)	5824 (30.6)	2133 (28.2)	3691 (32.2)	23 707 (31.2)
Obese (≥30)	3775 (19.9)	1439 (19.0)	2336 (20.4)	17 379 (22.9)
Not recorded	1544 (8.1)	630 (8.3)	914 (8.0)	8454 (11.1)
IMD quintile				
1 (most deprived)	2396 (12.6)	1066 (14.1)	1330 (11.6)	9933 (13.1)
2	2846 (15.9)	1190 (15.7)	1656 (14.5)	11 514 (15.1)
3	3617 (19.0)	1488 (19.7)	2129 (18.6)	14 720 (19.4)
4	4684 (24.6)	1763 (23.3)	2921 (25.5)	18 137 (23.9)
5 (least deprived)	5117 (26.9)	1898 (25.1)	3219 (28.1)	20 388 (26.8)
Not recorded	351 (1.8)	152 (2.0)	199 (1.7)	1352 (1.8)
Comorbidities				
Type 2 diabetes	1665 (8.8)	506 (6.7)	1159 (10.1)	6336 (8.3)
Hypertension	4249 (22.4)	1415 (18.7)	2834 (24.7)	17 591 (23.1)
Atrial fibrillation	658 (3.5)	194 (2.6)	464 (4.1)	2336 (3.1)
Angina	606 (3.2)	176 (2.3)	430 (3.8)	2075 (2.7)
Myocardial infarction	481 (2.5)	143 (1.9)	338 (3.0)	1650 (2.2)
Stroke	387 (2.0)	139 (1.8)	248 (2.2)	1382 (1.8)
Heart failure	296 (1.6)	103 (1.4)	193 (1.7)	1062 (1.4)
Chronic liver disease	386 (2.0)	127 (1.7)	259 (2.3)	487 (0.6)
Dementia	694 (3.7)	216 (2.9)	478 (4.2)	2786 (3.7)
Rheumatoid arthritis	281 (1.5)	106 (1.4)	175 (1.5)	706 (0.9)
Asthma	3796 (20.0)	1615 (21.4)	2181 (19.0)	12 924 (17.0)
COPD	982 (5.2)	399 (5.3)	583 (5.1)	2990 (3.9)
Mean duration of IBD, years (SD)	12.4 (12.0)	12.2 (11.6)	12.5 (12.3)	NA
Use of systemic therapy*	4183 (22.0)	1741 (15.2)	2442 (32.3)	700 (0.9)

*Defined as use of mercaptopurine, azathioprine, cyclosporine, methotrexate, tacrolimus or biological therapies.
BMI, body mass index; COPD, chronic obstructive pulmonary disease; IMD, Index of Multiple Deprivation; ; NA, not applicable.

Table 2 The prevalence of common mental health conditions in people with Crohn's disease (CD) and ulcerative colitis (UC) compared with population controls

	Anxiety episodes n (%)		Depressive episodes n (%)		Depressive disorder n (%)	
CD	Controls n=**30 228**	CD n=**7557**	Controls n=**30 228**	CD n=**7557**	Controls n=**30 228**	CD n=**7557**
Overall	892 (3.0)	262 (3.5), p=0.02*	1233 (4.1)	431 (5.7), p<0.001*	3911 (12.9)	1322 (17.5), p<0.001*
Sex						
Female	585 (3.5)	175 (4.2)	828 (5.0)	288 (6.9)	2749 (16.6)	933 (22.3)
Male	307 (2.3)	87 (2.6)	405 (3.0)	143 (4.2)	1162 (8.5)	389 (11.5)
Age (years)						
18–29	112 (2.3)	38 (3.2)	121 (2.5)	37 (3.1)	232 (4.8)	81 (6.8)
30–39	166 (3.2)	49 (3.7)	203 (3.9)	59 (4.4)	607 (11.5)	189 (14.1)
40–49	202 (3.5)	57 (3.9)	298 (5.2)	103 (7.1)	940 (16.3)	303 (20.9)
50–59	190 (3.4)	52 (3.7)	305 (5.4)	110 (7.8)	931 (16.6)	304 (21.6)
60–69	136 (2.9)	41 (3.6)	184 (3.9)	73 (6.3)	684 (14.6)	254 (22.0)
70–79	56 (2.0)	16 (2.3)	85 (3.1)	37 (5.4)	357 (12.9)	136 (19.9)
80+	30 (2.2)	9 (2.7)	36 (2.7)	12 (3.6)	159 (11.8)	55 (16.6)
	Anxiety episodes n (%)		Depressive episodes n (%)		Depressive disorder n (%)	
UC	Controls n=**45 816**	UC n=**11 454**	Controls n=**45 816**	UC n=**11 454**	Controls n=**45 816**	UC n=**11 454**
Overall	1221 (2.7)	341 (3.0), p=0.07*	1666 (3.6)	507 (4.4), p<0.001*	5676 (12.4)	1627 (14.2), p<0.001*
Sex						
Female	800 (3.5)	221 (3.8)	1051 (4.5)	324 (5.6)	3752 (16.2)	1044 (18.0)
Male	421 (1.9)	120 (2.1)	615 (2.7)	183 (3.2)	1924 (8.5)	583 (10.3)
Age (years)						
18–29	113 (2.5)	27 (2.5)	117 (2.5)	31 (2.9)	230 (5.0)	53 (4.9)
30–39	202 (3.0)	42 (2.5)	221 (3.3)	50 (2.9)	666 (10.0)	152 (9.0)
40–49	262 (3.3)	56 (2.9)	375 (4.8)	109 (5.2)	1134 (14.5)	312 (16.2)
50–59	227 (2.6)	79 (3.7)	413 (4.8)	131 (6.1)	1405 (16.2)	414 (19.2)
60–69	198 (2.4)	67 (3.2)	296 (3.6)	104 (5.0)	1140 (13.9)	349 (16.8)
70–79	131 (2.1)	42 (2.6)	155 (2.5)	58 (3.6)	720 (11.7)	224 (14.0)
80+	88 (2.4)	28 (3.1)	89 (2.5)	32 (3.5)	381 (10.5)	123 (13.4)

*P values compare people with UC and CD against controls, for overall groups only.

the following baseline comorbidities: type 2 diabetes, hypertension, atrial fibrillation, angina, myocardial infarction, stroke, heart failure, chronic liver disease, dementia, rheumatoid arthritis, asthma and chronic obstructive pulmonary disease.

Statistical analyses

Comparison of the prevalence of mental health conditions

We estimated the prevalence of the three common mental health conditions in people with IBD and the matched unexposed cohort at the date of study entry, stratified by condition (UC or CD). We then compared prevalence across subgroups by age and sex. For people with IBD, we also stratified by duration of disease, and the utilisation of systemic therapy as a surrogate marker of disease severity (defined as the use of immunemodulating medications; non-biological or biological therapies).

Measures of healthcare utilisation

Measures of healthcare utilisation were assessed in people with and without IBD over the 3-year study period. All utilisation outcomes were reported as annual rates, calculated as the number of events (including multiple events per individual) divided by the total person-years of follow-up. Each individual contributed person-time from their study start date to the earliest of the study end date (1 January 2019), the date of patient transfer from an included practice or date of death.

In people with IBD, we then explored associations between the three common mental health conditions (anxiety episodes, depressive episodes and depressive disorder) and three primary healthcare utilisation outcome measures (primary care visits, emergency hospital attendances and issue of statements of fitness for work). We evaluated associations using multivariable negative binomial regression models for primary care visit rates (to account for overdispersion), and zero-inflated Poisson regression for emergency hospital attendances and statements of fitness for work (to account for the fact many individuals did not have a record of either outcome over the study period). CIs were estimated using robust SEs. In addition to the presence or absence of each mental health condition, the multivariable feature set comprised of age category (18–29, 30–39, 40–49, 50–59, 60–69, 70+ years), sex, BMI category, duration of disease, socioeconomic status (IMD quintile), smoking status and comorbidities (as defined above). For BMI and socioeconomic status, we used the missing indicator variable method to ensure all individuals were included in the models, as these data are likely to be missing not at random, meaning multiple imputation approaches are likely to lack validity.

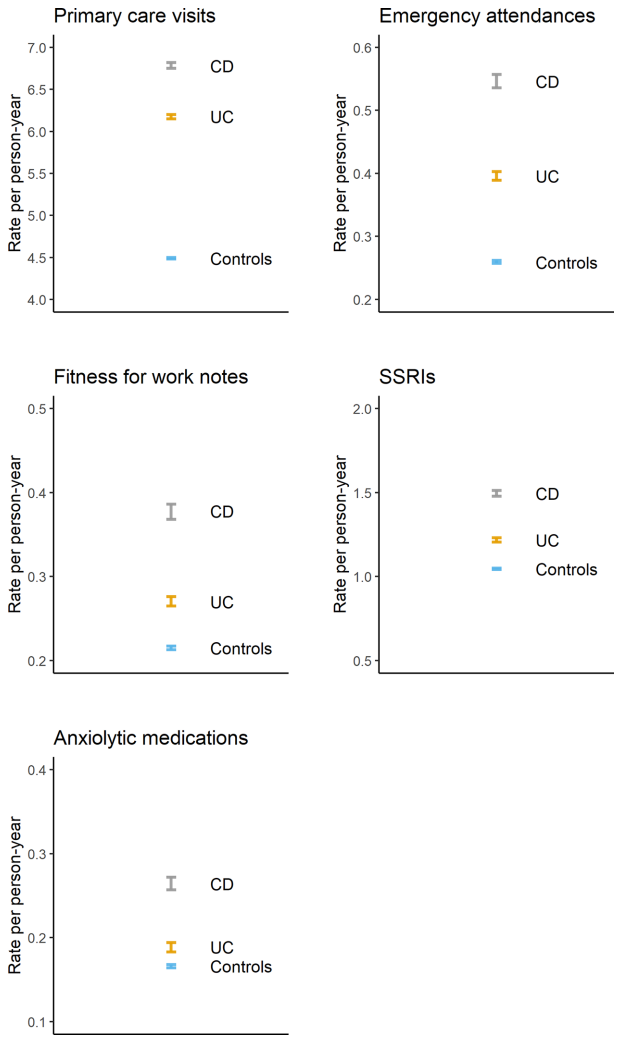

Figure 1 Healthcare resource use in people with IBD and matched controls during 3 years of follow-up. Data are rates per person-year, with 95% CIs. The absolute rates are provided in online supplemental table 9. CD, Crohn's disease; IBD, inflammatory bowel disease; UC, ulcerative colitis; SSRIs, selective serotonin reuptake inhibitors.

All statistical analyses were performed in R statistical package V.3.4.1.

FINDINGS

The cohort comprised of 19 011 people with IBD and 76 044 matched controls. The IBD and control groups were well matched for age and sex (table 1). Smoking was more common in people with CD than controls and less common in people with UC, and the proportion of people underweight was higher in people with IBD than controls. Several comorbidities (angina, rheumatoid arthritis, asthma, atrial fibrillation, myocardial infarction, chronic obstructive pulmonary disorder and chronic liver disease) had a higher prevalence in those with IBD than controls. People with UC were on average older than those with CD.

Prevalence of mental health conditions

Depressive episodes and depressive disorder were more prevalent in people with IBD (respective prevalence 5.7% and 17.5% for CD and 4.4% and 14.2% for UC) compared with matched controls (respective prevalence 4.1% and 12.9% for CD, and 3.6% and 12.4% for UC) (table 2). Anxiety episodes were more prevalent in people with CD compared with matched controls (3.5% vs 3.0%); in people with UC a similar pattern was observed but the difference was not statistically significant (3.0% vs 2.7%). These patterns were consistent in female and male subgroups, and broadly consistent by age category, although for people with UC there was no increase in depressive disorder for people under 40 years compared with matched controls of the same age (table 2). Anxiety, depressives episodes and depressive disorder were all more common in people with CD than UC.

The prevalence of recurrent depressive disorder increased with longer duration of CD and UC, but there were no clear trends in the prevalence of depressive or anxiety episodes with duration of disease (online supplemental table 8). The prevalence of mental health conditions was similar in people using systemic therapy compared with those not using systemic therapy (online supplemental table 8).

Healthcare utilisation

Rates of primary care visits were 47% higher in people with IBD than controls (incidence rate ratio (IRR) 1.47 (95% 1.43 to 1.51)). Rates were also higher in people with IBD than controls for secondary care emergency attendances (IRR 1.87 (95% CI 1.79 to 1.95)) and issues of statements of fitness for work (IRR 1.53 (95% CI 1.44 to 1.62)). Prescriptions for mental health conditions were also higher in people with IBD: SSRIs (IRR 1.22 (95% CI 1.13 to 1.32)) and anxiolytic medications (IRR 1.20 (95% CI 1.01 to 1.41)), likely reflecting the increased burden of mental health conditions in this group. For all of these outcomes, rates were higher for people with CD compared with people with UC (figure 1, for underlying data see online supplemental table 9). For both people with UC and CD, oral 5-ASA therapy was the most frequently prescribed medication (online supplemental table 10). Oral and rectal 5-ASA prescription rates were higher in people with UC than CD. Other IBD medication types (oral and rectal glucocorticoids, and non-biological immunemodulating medications) were more frequency prescribed in people with CD than UC (online supplemental table 10).

When studying only people with IBD, anxiety episodes and depressive disorder, but not depressive episodes, were independently associated with an increased rate of primary care visits (figure 2A). Depressive disorder was associated with an increased rate of secondary care emergency visits, but there was no evidence of association for anxiety episodes or depressive episodes (figure 2B). Depressive disorder, and, for people with UC only, anxiety episodes were associated with an increased rate of issue of statements of fitness for work (figure 2C). The full multivariable models for each outcome are reported in online supplemental table 11.

DISCUSSION

Our contemporary analysis of over 19 000 people with IBD shows that depressive episodes and depressive disorder are more common in people with IBD than age and sex-matched population controls, and the prevalence of anxiety episodes is higher in people with UC than in controls. People with IBD have substantially higher primary care and emergency secondary care visit rates and are issued more statements of fitness for work than controls. Despite higher prescribing rates of antidepressant medications in people with IBD, the presence of depressive disorder in people with IBD is associated with even higher primary care and emergency secondary care visit rates, and more statements of fitness for work being issued. Similarly, despite

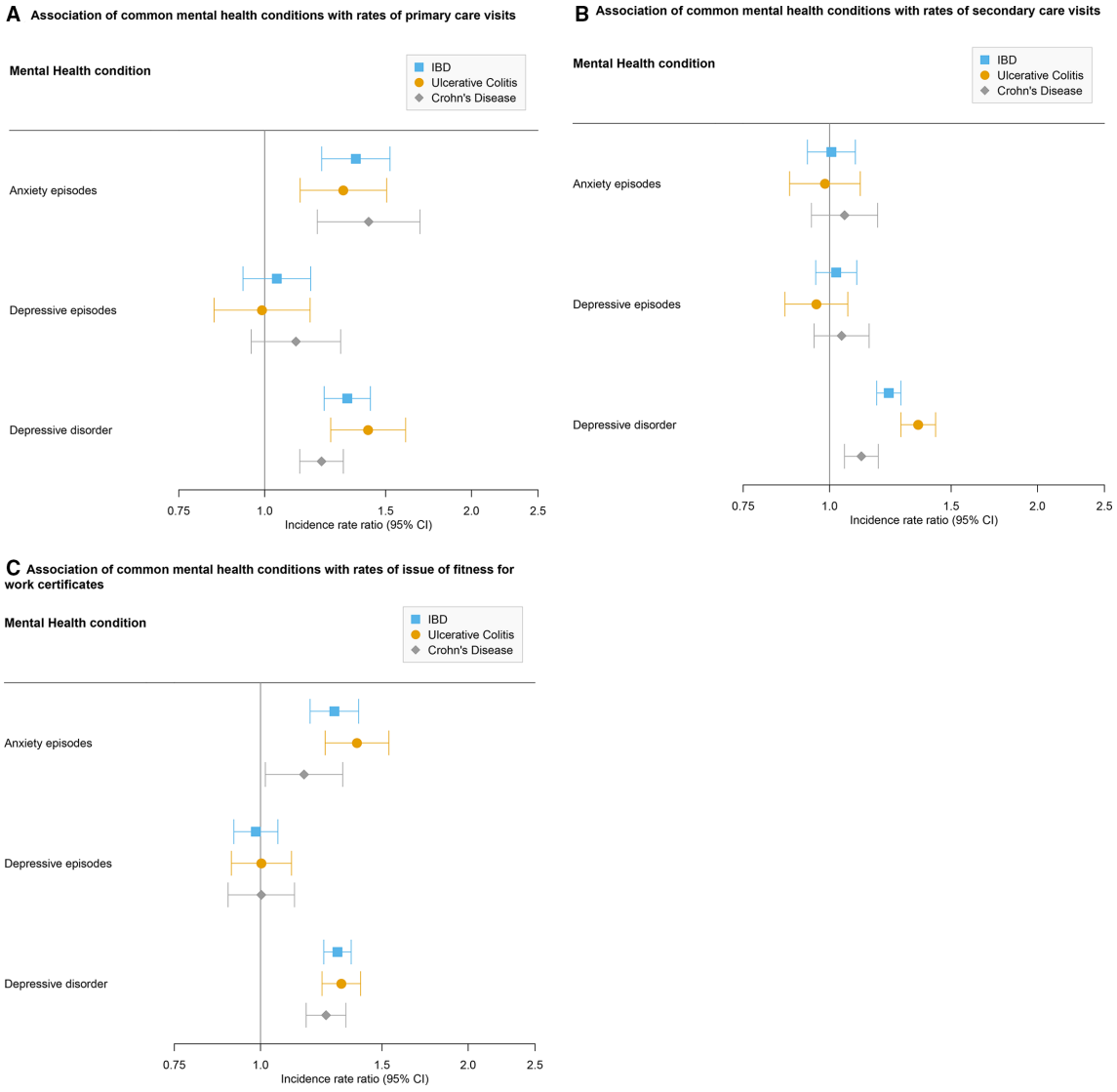

Figure 2 Association of common mental health conditions with rates of (A) primary care visits, (B) emergency secondary care visits and (C) fitness for work notes, in people with IBD. Estimates are adjusted incidence rate ratios (IRRs) with 95% CIs. For each mental health condition, IRRs represent the relative change in rate of the healthcare utilisation measure if the condition is present compared with if the condition is absent. An IRR greater than 1 indicates that the presence of a mental health condition is associated with an increased rate of healthcare utilisation. All estimates are adjusted for age at study entry, sex, duration of IBD, current use of systemic therapy, BMI and Index of Multiple Deprivation quintile (for full models see online supplemental table 11). Fitness for work notes are included as indicators of absenteeism from work due to ill health. BMI, body mass index; IBD, inflammatory bowel disease.

higher prescribing rates of anxiolytic medications in people with IBD, anxiety episodes are associated with more primary care attendances and statements of fitness for work being issued.

Comparison with the existing literature

The prevalence of depressive disorder observed in people with IBD in our study (17.5% for CD and 14.2% for UC) was consistent with previous population-based studies, including a US claims-based study of 330 000 people with IBD that reported depression in 16%,[7] and a systematic review which reported a pooled prevalence of depression disorders at 15.2% with higher rates observed in people with CD than UC.[8] Our higher rate of anxiety episodes observed in people with IBD versus controls is also consistent with previous reports.[6] In the aforementioned systematic review, the pooled prevalence of anxiety symptoms was 35.1%, and depression symptoms at 21.6%.[8] Our observed prevalence for active depressive episodes (3.5%) and anxiety episodes (5.7%) is much lower than these estimates. The likely reason for our lower prevalence values is our validated approach to case finding for these episodes, requiring both a clinical diagnosis and concurrent treatment, compared with estimates based on patient-reported symptoms used in many papers informing the review. The review did however identify three small studies which used a review of medical records to identify psychiatric conditions. The pooled prevalence of anxiety disorders within these studies was 5.4%, similar to our result.

Prior observational analysis in the UK has demonstrated that depression is associated with higher risk of development of IBD and this risk is, in part, mitigated by the use of antidepressant medication.[24] Our data demonstrate greater use of antidepressant medication in people with IBD and therefore do not suggest undertreatment of depression is a major component of IBD risk, although our study was not designed to test this hypothesis.

To our knowledge, our study is the first to report the impact of concomitant mental health conditions on primary care and emergency attendance in people with IBD. Concordant with our findings that the combined impact of IBD and common mental health conditions on healthcare utilisation is significant, separate US health economic analyses have reported a higher rate of outpatient visits and hospital admission in people with IBD than in those unaffected,[25] and that concurrent psychiatric illness in IBD contributes substantially to healthcare costs in those with IBD.[26]

A unique contribution of our study is the demonstration of higher rates indicators of absenteeism due to ill health (as assessed by issue of statements of fitness for work) in people with IBD compared with matched controls, as well as an evaluation of the impact of concurrent mental health conditions on absenteeism. A systematic review of the indirect costs associated with IBD identified several small studies and one large cohort study assessing the burden of sick leave.[4] This large cohort study used US claims data to explore the direct and indirect cost associated with IBD, however data on absenteeism were only available for a small proportion of the cohort and did not demonstrate a significant difference in absenteeism between people with IBD and controls.[27]

Strengths and limitations

Key strengths of our study include the large population-based sample, the validated approaches to case finding for IBD and mental health conditions, and the high level of data completeness and data quality within RCGP RSC. Our approach to matching people with IBD by age, sex and time since practice registration with controls within their own primary care practice is a further strength of the study design. As a representative population sample,[8] our cohort is broadly representative of the estimated 620 000 people living with IBD in the UK. As with all observational studies of this type, a limitation of our analysis is that we were unable to determine any causal associations. Despite the use of validated diagnostic algorithms to define both IBD and common mental health conditions,[19 22] we cannot guarantee the accuracy of these diagnoses, and underdiagnosis or overdiagnosis offers a potential explanation for our findings. Furthermore, data on people with IBD solely using secondary care services were not available for our study, although these will represent a small minority of patients. People with IBD have specific care pathways, meaning they have increased contact with healthcare providers, potentially resulting in recording and data capture biases which may have led us to overestimate the associations between IBD and mental health conditions. In addition, in the UK, prescriptions for biological therapies are mostly provided in secondary care, meaning that we are likely to have systematically undercaptured the prescribing of biological therapies. Similarly, we lacked data on hospital outpatient appointments and inpatient admissions, and evaluation of these aspects of healthcare utilisation in people with IBD would be an important area for future work where hospital-linked records are available. We were unable to assess the duration or reason for time off work, as these are not well captured in UK primary care records. Finally, while the aim of our study was to estimate the burden of mental health comorbidity in the whole population with IBD, further work is needed to establish the interplay between IBD disease activity and mental health.

Clinical implications

Our results demonstrate depression and anxiety are more common in people with IBD than those of the same age and sex who are unaffected. In people with IBD, common mental health conditions are independently associated with increased healthcare use and absence from work over and above the excess associated with IBD alone. While we are unable to confirm a causal relationship, these data indicate that evidence-based interventions to address psychological well-being, such as the English Improving Access to Psychological Therapies service,[28] could help reduce both patient and healthcare burdens in IBD. Antidepressant and anxiolytic medications are effective for mood disorders in IBD, however they are only one component of comprehensive treatment.[29] While there is a high rate of pharmacological treatment for mood disorders in IBD, only a small proportion of people with coexisting IBD and mental health conditions have adequate access to psychological therapies.[29] In a recent Australian study, an integrated model of psychological screening and interventions was delivered as a hospital-based service for people with IBD and substantially improved anxiety, depression and overall quality of life.[30] Programmes to improve access to mental health services for people with IBD are likely to improve quality of life for those affected and may also prove cost-effective by reducing the excess healthcare utilisation in this patient group.

CONCLUSIONS

Depressive episodes, depressive disorder and anxiety are more common in people with IBD than controls. People with IBD have substantially higher primary care and emergency secondary care visit rates and more time off work for illness. Despite higher prescribing rates of antidepressant and anxiolytic medications in people with IBD, coexisting mental health conditions are associated with a further increase in primary care and emergency secondary care visit rates, and time off work. This suggests evidence-based mental health interventions may be of particular value to support people with IBD.

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Collaborators None.

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Patient consent for publication Not required.

Ethics approval Study approval was granted by the RCGP RSC Study Approvals Committee. The study does not meet the requirements for formal ethics board review as defined using the National Health Service (NHS) Health Research Authority research decision tool (http://www.hra-decisiontools.org.uk/research/). The study is an observational study using the anonymised, routinely collected, data of primary care patients in the UK. This means there was no randomisation and there was no change to treatment or patient care as part of this study. As such, explicit written or verbal consent was not required. All primary care practices providing data display messages to their patients informing them that their anonymised data may be used for observational research studies. All patients registered with participating centres are provided with the option to opt out of data sharing for this purpose. Data from patients choosing to opt out of data sharing are not analysed. All patient data are pseudonymised at the point of data extraction for the participating practices. Prior to inclusion in the study, data were fully anonymised by the data custodian so no patient identifiable data were available to researchers.

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Data availability statement Data may be obtained from a third party and are not publicly available. The RCGP RSC dataset is held securely at Oxford University and the University of Surrey and can be accessed by bona fide researchers. Approval is on a project-by-project basis (www.rcgp.org.uk/rsc). Ethical approval by an NHS Research Ethics Committee may be needed before any data release/other appropriate approval. Researchers wishing to directly analyse the patient-level pseudonymised data will be required to complete information governance training and work on the data from university secure servers. Patient-level data cannot be taken out of the secure network.

ORCID iDs
Peter Irving http://orcid.org/0000-0003-0972-8148
Simon de Lusignan http://orcid.org/0000-0002-8553-2641

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