

**Body Image Dissatisfaction in association with
Disease Activity, Treatment, DASS and
General Happiness in IBD.**

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Abstract

This study aimed to examine the association between body image dissatisfaction (BID) in patients of IBD with factors relating to their disease and their emotional states. This was a mixed study of cross-sectional and correlational design. Participants (n = 111) completed a self-reporting questionnaire on demographics, disease type, disease activity, drug treatment types and surgical procedures. Depression, anxiety, stress and general happiness scales were also included. Qualitative questions (n = 4) addressed the interference IBD had on the patient's daily life. The results found a significant difference in BID in patients with Crohn's disease, moderate to severe disease activity and cortisol steroid use. BID was found to predict DASS and general happiness in patients. Depression and anxiety was found to predict BID in patients revealing a bi-directional relationship. The presence of BID, negative emotions and the interference these have on patients functioning should be considered in the treatment of IBD.

1. Introduction

Inflammatory Bowel Disease (IBD) is a chronic auto-immune disease that causes ulceration and inflammation of the digestive tract. The most commonly found types of IBD are Ulcerative Colitis and Crohn's disease. Approximately 20,000 people in Ireland are living with IBD. While onset can occur at any age, the peak age range for diagnosis is 15 years to 35 years (Treatment for IBD, n.d.). Patients living with IBD experience a number of debilitating and embarrassing symptoms (Inflammatory bowel disease (IBD) Definition, n.d.) such as abdominal pain, fatigue/lethargy, diarrhoea, weight loss (Maddux, Bass, Geraghty-Sirridge, Carpenter & Christenson, 2013), bleeding, nausea, vomiting, cramps, anaemia, and fever (Treatment for IBD, n.d.). IBD is caused by an abnormal response in the immune system; there is no cure for IBD (Greenley et al., 2010). The aim of treatment is to induce a state of remission in order to achieve relief (Treatment for IBD, n.d.). Periods of remission can last for several weeks to several years. Disease type and activity levels will determine drug treatment type and in severe cases surgery may be required (Treatment for IBD, n.d.). This study sought to gather experiences directly from people who are currently dealing with the effects of IBD in the form of Ulcerative Colitis or Crohn's Disease. For the purposes of this study focus was applied to the consequence of living with IBD on an individual's body image and mental health.

1.1. Body Image

Much research carried out in relation to IBD has examined the Quality of Life (QOL) in patients. Nedelciuc, Pintilie, Dranga, Mihai and Prelipcean (2012) used the QOL measurement with the purpose of gaining a better understanding of the impact of IBD on patient's lives. Drossman, Patrick, Mitchell, Zagami and Appelbaum (1989) looked to understand the experience of a chronic illness through QOL. In 1998 however, Dunker et al.

conceptualised that while much research addressed QOL in patients with IBD following both medical and surgical treatments, little was known about the “suggestive feelings of the patients” (p. 1) or the implication and consequence of scarring after surgery. According to Dunker et al. (1998), body image is defined as “a person’s perception of, satisfaction with, and attitudes towards his or her body in general and to particular areas of the body” (p.1). Dunker et al. (1998) acknowledged the use of body image measures in relation to cancer patients who had under gone mutilating operations and adapted this measurement to surgically treated IBD patients with Crohn’s disease. Comparing the results of different surgical techniques in the treatment of Crohn’s disease, Dunker et al. (1998) found a significant difference in levels of body image in patients.

More recently McDermott et al. (2014) suggest that while the study of QOL in patients of IBD was a good general measure it lacked the ability to identify specific disabilities. McDermott et al. (2014) define body image as “a person’s overall sense of their physical appearance and body function” (p. 1) which can be negatively influenced by factors such as disease and treatment types. While in 2001, Hopwood, Fletcher, Lee and Al Ghazal validated the use of a body image scale in breast cancer patients, no validated questionnaire or previous studies had formally addressed body image as a measurement in IBD. In 2014, McDermott et al. modified the Hopwood body image dissatisfaction (BID) scale (Hopwood, et al., 2001) and validated its use in patients with IBD. BID was a measure more easily understood and relevant to all (McDermott et al., 2014) and in using this scale McDermott et al. (2015) found an association between BID in patents of IBD with steroid use, active diseases and surgical treatments; both non-stoma and stoma forming.

It has been postulated that functional disturbances and physical disfigurement from medical diseases, drug and surgical treatments can adversely affect the perception of one's body (McDermott et al. (2015). The side effects of steroids for example can cause weight gain, including facial swelling otherwise known as "moon face" (Inflammatory bowel disease (IBD) Definition, n.d.), hair loss, acne, weakness, loss of concentration. While the findings reported by McDermott et al., (2015) on BID are of important relevance to this study, it is necessary to note that this study was of a cross-sectional design and did allow for some causality. It was unknown if body image dissatisfaction was a result or a consequence of other psychological complaints in IBD (McDermott et al., 2015). However similar research has verified and added support to the findings that BID was associated with greater disease activity, higher symptom burden, longer use of steroid treatment and lower QOL (Saha et al., 2015). IBD has also shown to have had an impact on relationships, body image and sexual function in patients with up to 66.8% of participants displaying impaired body image (Muller, Prosser, Bampton, Mountifield & Andrews, 2010).

While measuring body image in children and adolescents with and without chronic diseases it was highlighted that young people with chronic illness had a less positive body image than healthy individuals but also that the BID levels varied depending on the age of disease onset (Pinquart & Shen, 2011). IBD in adolescence can cause significant growth and puberty delay (Michaud, Suris & Viner, 2007). As body image begins to form in childhood and continues to develop through adolescents and young adult hood (McDermott et al., 2015) the age of diagnosis may be a factor of consideration. IBD onset can occur at any age; if diagnosis occurred during early developmental period it could have negative repercussions and result in higher levels of BID in later years.

This current study was designed considering the aforementioned research in relation to body image dissatisfaction and the wish to add further empirical support to the association of body image with greater disease activity and the use of cortisol steroids. This study was designed to capture the experiences from patients with both forms of the disease, Ulcerative Colitis and Crohn's disease. The aim was to identify if and to what extent disease types, the age and length of disease diagnosis, the 4 various drug treatment types including cortisol steroids and surgery as treatment for IBD were associated with BID in patients.

It has been theorised that patients with Ulcerative Colitis live with the prospect of a potential disability which impacts on the patient's life and career (Nedelciuc et al., 2012). In evaluating the QOL of patients with Ulcerative Colitis, flare severity in patients was also found to significantly impact on QOL (Nedelciuc et al., 2012). Previous to 2004 no validated measure of body image disturbance existed. Cash, Phillips, Santos and Hrabosky (2004) developed a body image disturbance questionnaire which established new measures of body image and psychosocial functioning. In using this questionnaire a positive correlation between body image disturbance with depression, social anxiety and eating disturbance was identified and the questionnaire was validated for use (Cash et al., 2004). To further understand the extent of the impact of IBD on patients' lives, McDermott et al. (2015) incorporated the use of the Cash body image disturbance questionnaire (Cash et al., 2004). The results of this questionnaire identified that patients were not only concerned about the physical effects of IBD but also the psychological and social consequences of living with BID (McDermott et al., 2015). As little qualitative research has examined the impact and inference of IBD on patients' lives this current study was designed to include a qualitative aspect. Four open-ended questions extracted from the Cash body disturbance scale (Cash et

al., 2004) were included to gain a deeper understanding of the individual struggles and psychological repercussions of living with IBD.

1.2. Mental Health Effects

IBD has been found to have a negative impact on all aspects of health-related QOL (HRQOL) in Ulcerative Colitis (Nedelciuc et al., 2012). It has also been postulated that the psychosocial adjustment of young patients with IBD has suggested the presence of high levels of depressive, internalising disorders and lower reporting of psychosocial functioning (Greenley et al., 2010). Guthrie et al. (2002) suggested that both psychological symptoms and disease severity or activity contribute independently to impaired HRQOL. Assessed psychosocial functioning among patients diagnosed with IBD found that 40% of patients will display abnormal anxiety levels (Bannaga & Selinger, 2015). Living with IBD is unpredictable. Between 25% to 50% of patients will relapse into periods of flare annually, 80% of patients with Crohn's disease and 25% of patients with Ulcerative Colitis will at some point require surgery (Bannaga & Selinger, 2015). Anxiety is related to periods of flare in patients but it has also been suggested to be present during periods of remission (Bannaga & Selinger, 2015).

According to McDermott et al. (2015) body image dissatisfaction and a negative self-evaluation can also lead to low self-esteem, impaired quality of life, depression, anxiety and stress in healthy patients. However it may also be true that that depression and low self-esteem can lead to body image dissatisfaction, making this a bi-directional relationship (McDermott et al., 2015). Within this study it was deemed important to evaluate the negative emotional states of patients with IBD. The foregoing research provides some evidence of an association between the effects of IBD on negative emotions under various conditions.

Greenley et al. (2010) analysed the effects of IBD on depression whereas Bannaga and Selinger (2015) examined the relationship between the Ulcerative Colitis and anxiety. This current study aspired to provide insight into the relationship between the effects of both types of IBD (Ulcerative Colitis and Crohn's disease) on BID with all 3 negative emotions; depression, anxiety and stress. In order to ascertain this relationship a measure including all 3 negative emotions was utilised in the form of the depression, anxiety and stress scale (DASS) (Lovibond & Lovibond, 1995). The purpose of using this scale was to establish the relationship between BID and DASS and to establish if this relationship was bi-directional.

The preceding research has suggested much research in relation to the emotional states of patients with IBD has addressed negative emotions, with little research focused on positive emotions. Lyubomirsky and Tucker (1998) hypothesise that happy people perceive, interpret, and think about the same events in more positive ways than unhappy people simply by seeing humour in the face of adversity. Self-rated happy individuals tended to think about events more favourably and adaptively than unhappy individuals (Lyubomirsky & Tucker, 1998). This is an important considered factor when faced with adversity in the form of a chronic illness. Increasing interest in positive psychology examines alternative interventions to suffering, with some interventions seen to increase happiness and decrease depressive symptoms (Seligman, Steen, Park & Peterson, 2005). It was also conceptualised that high subjective wellbeing in the form of life satisfaction, positive emotions and optimism result in better health and longevity (Diener & Chan, 2011). While this theory is considered controversial in relation to individuals with certain diseases, examining the positive emotions in participants in contrast to negative emotions was considered relevant to this study. The subjective happiness scale (Lyubomirsky & Tucker, 1998) was included with this study to examine the relationship between BID in patients with general happiness levels.

1.3. *Aim of Research*

The aim of this study was to examine the association between BID in patients of IBD with factors relating to their disease and their emotional states. Considering both forms of IBD (Ulcerative Colitis and Crohn's disease), the research sought to explore the extent to which disease type, the age of diagnosis, the length of diagnosis, disease activity and drug and surgical treatment type's impacted on BID in patients of IBD in Ireland. This study also aimed at establishing an association between BID with depression, anxiety, stress and subjective or general happiness in patients with IBD. This study of mixed correlational and cross-sectional design included both a quantitative and qualitative aspect. A self-reporting questionnaire encompassed a list of quantitative questions on demographics, disease history, disease activity, drug treatment types and surgical procedures. Four qualitative questions addressed the interference in the daily lives of patients from body image disturbance. The purpose of the research was to gain a deeper understanding into the nature of the disease, the psychological outcomes and the individual challenges patients face while living with IBD. These findings can be considered when implementing future treatment programmes to improve the patient's life and well-being.

The Hypotheses for this study are listed as follows;

H₁. Disease type and disease activity will be associated with body image dissatisfaction levels in patients with IBD.

H₂. The age of diagnosis and length of diagnosis will predict body image dissatisfaction levels in patients with IBD.

H₃. Drug treatment type will be associated with of body image dissatisfaction in patients with IBD.

H₄. Surgical treatment type will be associated with levels of body image dissatisfaction in patients of IBD.

H₅. Levels of body image dissatisfaction will predict levels of depression, anxiety and stress in patients with IBD.

H₆. Levels of body image dissatisfaction will predict levels of subjective happiness in patients with IBD.

2. Methods

2.1. Participants

Participants for this study were diagnosed patients of IBD, either Ulcerative Colitis or Crohn's disease. A priori power calculation using Cohen's table (Cohen, 1992) based on a significant level of 0.5 and a medium effect size recommended a sample size of 64 participants for measures of difference and 85 participants for a correlation measure. As several different measures were used in this study, the aim was to recruit 100 participants. The total number of participant responses for this study was 111. All participants were aged 18 years or older.

Participants for this study were sourced through purposive and snowball sampling. Participants were drawn from a population of approximately 20,000 people living in Ireland with IBD. Participants were members of on-line Ulcerative Colitis and Crohn's disease support groups. Members of these groups were invited to participate in this study through the group's Facebook page and/or website. The on-line support groups that engaged in this study included 'Crohn's and Ulcerative Colitis Ireland', 'Crohn's and Colitis UK – Northern Ireland' and 'Let's Talk Crohn's and Colitis Northern Ireland'. Other participants were contacted through associations with IBD and invited to participate through email. The participants in this study received no reward or incentive for their participation.

The age of the participants ranged from 18 years to 67 years of age. The mean age was 37.61 years and SD to age was 11.14 years. The mean age of diagnosis of IBD was 25.79 years and mean number of years diagnosed with IBD was 11.88 years ranging from less than 1 year to 46 years diagnosed. Female participants accounted for 75.7% (n = 84) of the overall

responses with 24.3% (n = 27) male participants. Sixty-two percent of participants were diagnosed with Crohn's Disease (n = 69) while thirty-six percent were diagnosed with Ulcerative Colitis (n = 40).

2.2. Design

This study was of mixed design, incorporating both a cross-sectional and correlational design. The cross-sectional design measured the different levels of the dependant variable BID in relation to the independent variables; disease type, drug therapies and surgical treatment. The correlational design analysed the relationship between the predictor variables disease activity, age of diagnosis, length of diagnosis and their effect on the criterion variables BID, depression, anxiety, stress and general happiness. This study included both a quantitative and qualitative aspect. The quantitative aspect included a list of closed-ended questions within a questionnaire while the qualitative aspect comprised of four open-ended questions.

2.3. Materials

Each participant was invited to complete an on-line self-reporting questionnaire and requested to complete every section. The questionnaire was created using Google Forms. The questionnaire was divided into various sub-sections. After requesting consent to participate and confirming age at 18 years or older 4 demographic questions were asked, for example "What age are you?" and "What sex are you?" Three questions on disease history required selection on the type of IBD diagnosed and specification of the length and age of diagnosis. The questionnaire also included 3 questions in relation to the disease. Participants were asked to best describe their current disease activity by index selection, to indicate their current drug treatment(s) and to note if they had undergone any surgical procedures as a treatment for

IBD. These closed-end demographic questions were aimed at providing a background into the patient's disease history (see appendices A- E for questions).

Two separate body image assessment tools were included in this questionnaire. The modified Hopwood body image scale (Hopwood, et al., 2001) assessed the effects of the disease and treatments on body image dissatisfaction (see appendix F). Participants were asked how they felt about their appearance, for example "Have you been feeling self-conscious about your appearance?" Participants were instructed to read each item carefully and select the reply that was most relevant to how they felt during the past week. The original form of this scale created by Hopwood et al. (2001) was used in research conducted on cancer patient and displayed a high reliability Cronbach's alpha score of 0.93. In 2014, McDermott et al. modified this scale and validated its use for patients of IBD displaying a similar high reliability Cronbach's alpha score of 0.93. The modified Hopwood body image scale (McDermott et al., 2014) omitted the last question in relation to surgery and therefore contains 9 questions. Participants selected a score ranging from 0 "Not at all" to 3 "Very much". The scores for each response were summed to produce an overall score for each participant. The lowest possible score was 0 and highest possible score was 27. A score of zero represents no body image dissatisfaction or distress whereas the higher scores indicate increasing levels of body image dissatisfaction or distress.

Four qualitative questions were extracted from the Cash Body Image Disturbance Scale (Cash et al., 2004) and included in the questionnaire (see appendix G). These open-ended questions asked how participants felt about their body and focused on the repercussions of body image disturbance. Participants were asked what concerns they had about the

appearance of their body, what effect these preoccupations had on their life and how they have interfered with their functioning.

A Depression, Anxiety and Stress Scale (DASS) (Lovibond & Lovibond, 1995) included in this survey questions the negative psychological symptoms in patients (see appendix H for list of questions). This scale sought to measure the emotional states of depression, anxiety and stress in patients. In 1995, Lovibond and Lovibond reported high reliability scores on each variable within the 21-item version; depression scored a Cronbach's alpha of .96, anxiety .92 and stress .95. Each of the three scales depression, anxiety and stress contained 7 items. The depression scale measured dysphoria, hopelessness, devaluation of life and self-deprecation. The anxiety scale assessed variables such as autonomic arousal, skeletal muscle effects and situational anxiety. The stress scale assessed difficulty relaxing, nervous arousal and ease of agitation. Participants were requested to indicate how much the statement applied to them over the past week. Participants were advised that there were no correct or incorrect answers and not spend too much time on any one statement. The 21 questions were scored from 0 to 3 where 0 represents "Did not apply to me at all" and 3 "Applied to me very much or most of the time". A template provided with the questionnaire indicates which questions belonged to which scale. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items. As this was the short-form DASS, total scores for each scale were multiplied by 2. The recommend cut-off scores were provided, for example mild levels of depression score a total of 10-13 and sever levels of anxiety score a totals of 15-19 (see appendix H for scoring template and cut-off scores).

The final section of this questionnaire included the subjective happiness or the general happiness scale (Lyubomirsky & Tucker, 1998). This scale, designed to measure the

subjective happiness in individuals and test the hypothesis that happy people perceive, interpret and think about the same events in more positive ways, displayed good internal consistency with a Cronbach's alpha score of .89 (Lyubomirsky & Tucker, 1998). Participants were presented with 4 statements and requested to score these as most appropriate in describing themselves, for example "In general, I consider myself: ". Scores ranged from 1 "Not a very happy person "to 7 "A very happy person" (Lyubomirsky & Tucker, 1998). The options vary for each of the four questions (see appendix I for list of questions). The scores for the last question were reversed. The scores for each statement were summed to give a total for each participant. The least possible score being 4 indicated low happiness levels and the highest score of 28 indicated high levels of happiness.

2.4. Procedure

A research proposal and research ethics application form was first submitted to the Department of Psychology and the Department of Psychology Ethics Committee in Dublin Business School in October 2015. The research proposal was passed and ethical approval for this study was granted in November 2015. The questionnaire was compiled and created on Google Forms in December 2015. The mediators of the on-line IBD support groups were contacted by email or through the group's website or Facebook page from the 19th December 2015. Consent was sought from each support group 'Crohn's and Ulcerative Colitis Ireland', 'Crohn's and Colitis UK – Northern Ireland' and 'Let's Talk Crohn's and Colitis Northern Ireland' prior to posting surveys on the group webpages or Facebook pages (see appendix J for group contact details). Once consent was granted a link to the questionnaire was uploaded to the group's Facebook page with a brief description of the study outlining the purpose and aim of this study. On contacting 'Crohn's and Colitis UK – Northern Ireland' in January 2016 a general email was sent by the committee to those members of the group who had provided

an email. This email gave a brief explanation of the study and contained the link to the questionnaire with the invitation to participate. Between 19th December 2015 and 30th January 2016 individuals known through association with IBD were emailed and invited to participate in the study.

The purpose and the aim of the study were outlined on the cover page of this questionnaire. This study sought to gather experiences directly from people dealing with the effects of IBD in the form of Ulcerative Colitis or Crohn's Disease. The aim of the study was outlined as to examine the association between body image levels in patients with IBD with factors relation to their disease and treatment. Individuals were invited to take part in this study as diagnosed patients of IBD over the age of 18 years with no learning disabilities. Individuals were advised that participation in the study was voluntary and that they could choose not to participate. Individuals were also advised that they could withdraw at any time during the study. It was noted that the questionnaire would take approximately 20 minutes to complete, that responses would be confidential and identifying information would not be collected. The cover page highlighted that survey questions would be related to experiences with IBD. Participants were informed that all data would be stored in a password protected electronic format. After data had been collected there would be no option to withdraw data as it would be anonymous. It was highlighted that some individuals may be sensitive to some of the questions within the survey and contact details to the support group 'Irish Society for Colitis and Crohn's' (ISCC) were provided. Contact details to the researcher and supervisor were also provided. Once consent was given by the participant and age was confirmed at over 18 years participants were lead through the various sections of the questionnaire (see appendix K for cover letter including consent section). On completion of the questionnaire

participates were thanked for their time and contact details for the ISCC and the researcher were again provided. On February 4th 2016 the questionnaire was closed to participants.

Data retrieval and data analysis commenced in February 2016. All data analysis was performed on the IBM Statistical Package for the Social Sciences (SPSS), version 22. The responses to the 4 open ended questions were analysed, coded and interpreted. Responses were considered for each of the 4 questions and the main themes identified.

3. Results

3.1. Descriptive Statistics

Disease type, activity & treatment.

From a total of 111 participants, 62% (n = 69) of participants were diagnosed with Crohn's Disease and 36% (n = 40) were diagnosed with Ulcerative Colitis. One participant stated 'Other' in response to disease type and 1 participant did not specify their disease type. In relation to disease activity, 21.6% (n = 24) of participants reported the disease to be inactive. Those with mildly active disease accounted for 45% (n = 50) of participants while 32.4% (n = 36) reported to have moderate to severe disease activity. Ninety-two participants reported to be on one or multiple forms of medication as a treatment for their disease while 19 participants reported not to be following any medication treatments at the time. Participants were undergoing 4 different drug types; aminosalicylates (n = 53), cortisol steroids (n = 22), immunomodulators (n = 42) and biologic therapies (n = 42). Less participants, 46.8% (n = 52) had undergone some type of surgery for IBD compared to 53.2% (n = 59) participants had not undergone surgery for treatment of IBD.

Body image dissatisfaction.

The mean score of BID across all 111 participant was 14.55 (SD = 8.50). Higher scores indicated higher levels of BID from a minimum score of 0 and maximum possible score of 27. Table 1 below shows the mean, standard deviation and reliability scores for all 111 participants on the dependant variables. Each variable met the preferred reliability score of .8.

Table 1 *Descriptive Statistics of Psychological Measures*

Variable	Mean	SD	Reliability
Body Image Dissatisfaction	14.55	8.50	.93
Depression	18.90	13.28	.94
Anxiety	15.40	12.39	.88
Stress	20.33	12.41	.92
Subjective Happiness	18.24	5.37	.87

DASS.

Each element of DASS, depression, anxiety and stress was examined individually and compared. The highest possible score on each scale was 42. Severe levels of anxiety (M = 15.40), moderate levels of depression (M = 18.90) and moderate levels of stress (M = 20.33) were found in patients. The standard deviation scores show a similar level of variability from the mean score in each measure.

Subjective happiness.

The mean score on general happiness was 18.24 (SD = 5.38) out of a possible maximum score of 28. Higher scores indicate higher levels of subjective happiness.

3.2. Inferential Statistics

When checking the assumptions of parametric testing, the retrieved data suggested a non-normal distribution of scores. However, due to the sufficient sample size parametric testing was deemed sufficiently robust to handle the non-normal data.

Disease type and activity.

An Independent t-test was carried out to establish the difference in BID in patient's disease type and a statistically significant difference was established. Patients of Crohn's disease reported a higher level of BID (M = 15.93, SD = 8.36) than patients of Ulcerative Colitis (M = 12.38, SD = 8.21). The mean difference between disease type was -3.55, (t(107) = -2.15, p = .034, CI (95%) -6.82 - -.28). Therefore the null hypothesis was rejected in this case.

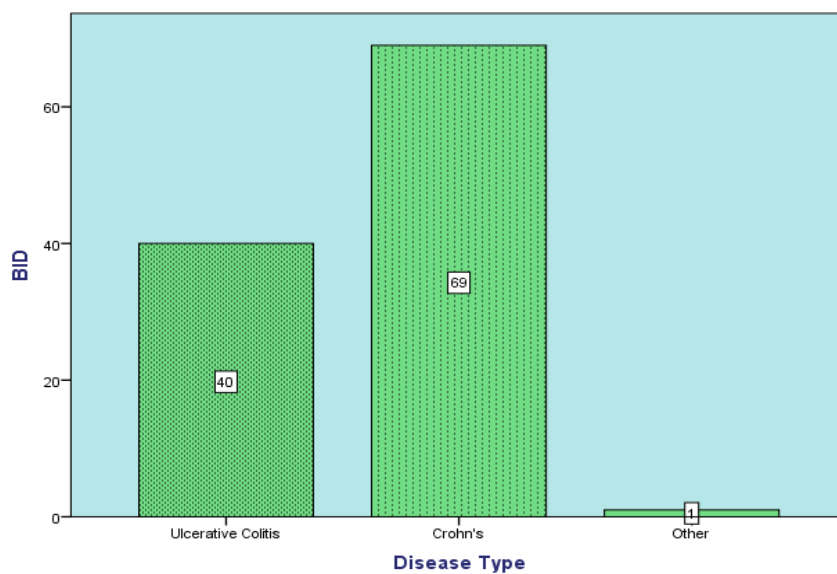


Figure 1 Bar Chart of BID levels in Disease Type

A one-way between groups Anova was carried out to establish if levels of disease activity predict higher BID levels in patients. The results showed that the levels of BID did differ significantly between disease activity (F (2, 33) = 5.90, P = .004). More specifically Tukey HSD post hoc analysis highlighted that patients with moderate to severe disease activity (M = 18.11, SD = 7.75) scored significantly higher on BID than patients with inactive disease (M = 11.13, SD = 8.18) and patients with mildly active disease (M = 13.54, SD = 8.47). The mean difference in scores between the moderate to severe disease activity

and inactive disease activity was 6.99 and the mildly active disease 4.57. This variance highlighted that activity and severity of the disease predicted higher levels of BID in patients.

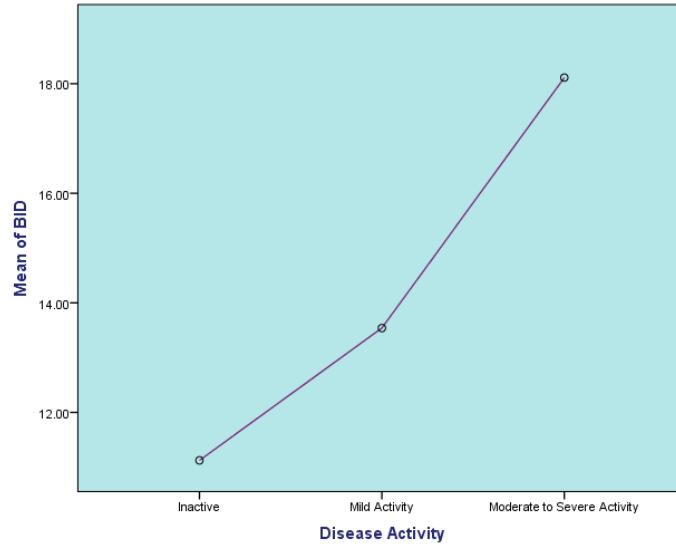


Figure 2 Means Plot of BID in Disease Activity Levels

To examine the association with age of disease diagnosis and levels of BID a linear regression was carried out. This linear regression found that the age at which patients are diagnosed did not significantly predict BID levels in patients ($F(1,109) = 2.80, p = .097$) (Age, $\beta = -.158, p = .097, CI (95\%) -.307 - .026$). Thus the null hypothesis was accepted.

A further linear regression was used to determine if the length of disease diagnosis predicted BID level in patients. This linear regression found that the length in years of a patients diagnoses did not significantly predict BID levels in patients ($F(1,109) = .74, p = .391$) (Year's, $\beta = -.082, p = .391, CI (95\%) -.26 - .101$). Thus the null hypothesis was accepted.

Disease treatments types.

The BID levels of patients undergoing the 4 various drug treatments aminosalicylates (n = 53), cortisol steroids (n = 22), immunomodulators (n = 42) and biologic therapies (n = 42) were analysed and compared. An independent t-test was carried out for each of the 4 drug treatment types. The results found that patients undergoing steroid treatment displayed a significant difference in BID (M = 18.59, SD = 8.08), the mean difference was 5.04. This finding ($t(109) = 2.55, p=.012, CI (95\%) 1.12 - 8.95$) indicated that the use of steroid treatment in IBD predicted higher levels of BID in patients. The null hypothesis was rejected in the use of cortisol steroids.

In contrast, subsequent independent t-tests revealed the use of aminosalicylates (M = 13.36, SD = 8.76) did not predict BID and a non-significant difference was established ($t(109) = -1.42, p = .159, CI (95\%) -5.47 - .91$). The use of an independent t-test on scores for patients undergoing immunomodulators drug treatment (M = 14.52, SD = 8.43) also found a non-significant difference in BID ($t(109) = -.03, p=.980, CI (95\%) -3.35 - 3.27$). Similarly, the results on the use of biologic therapies (M = 16.04, SD = 7.72) revealed a non-significant difference in levels of BID ($t(109) = 1.46, p = .148, CI (95\%) -.87 - 5.69$). Thus, in the case of Aminosalicylates, Immunomodulators and Biologic Therapies the null hypothesis was accepted.

From the total participants (n = 111), 52 patients had undergone some form of surgery. To identify a relationship between surgery and BID an independent t-test was carried out. The result revealed a non-significant difference in patients who had undergone surgery (M = 15.27, SD = 7.98) and BID, ($t (109) = .84, p = .405, CI (95\%) -1.86 - 4.56$). These findings show that there was little difference (mean difference = 1.35) in levels of BID in patients that

had undergone surgery and the null hypothesis is accepted. Table 2 below displays the t-test scores for BID in relation to the independent variables.

Table 2 *Independent t-test cores show the difference of BID in Disease Type, Drug Treatment Type and Surgical Treatment*

Variable	Group		Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Disease Type	Ulcerative Colitis		12.38	8.21	-2.15	107	.034
	Crohn's		15.93	8.36			
Drug Treatment Type	Aminosalicylates	Yes	13.35	8.76	-1.42	109	.159
		No	15.64	8.19			
	Cortisol Steroids	Yes	18.59	8.08	2.55	109	0.12
		No	13.55	8.35			
	Immunomodulators	Yes	14.52	8.84	-.03	109	.980
		No	14.56	8.35			
Biologic Therapies	Yes	16.05	7.72	1.46	109	.148	
	No	13.64	8.87				
Surgical Treatment	Surgery	Yes	15.27	7.98	.84	109	.101
		No	13.91	8.95			

Body image dissatisfaction and DASS.

In order to determine the effect of a change in BID levels on DASS a series of linear regressions were carried out with each element of DASS; depression, anxiety and stress. A significant association was found between the predictor variable BID and the criterion variable depression, this correlation was found to be moderately strong (Multiple $R = .61$). It was found that for every 1 score rise in BID, depression levels increased by .97. Confidence levels were narrow, showing 95% confidence that the population slope is between .733 and 1.22 ($F(1,107) = 64.09, p < .001, R^2 = .37$) (BID, $\beta = .61, p < .001, CI(95\%).73 - 1.21$). See table 3 below for all linear regression scores found in DASS.

The results of a linear regression carried out on the effect of BID on levels of anxiety also showed a moderately strong significant correlation (Multiple $R = .60$). It was found that for every 1 score rise in BID, anxiety levels increased by .87. Confidence levels were also narrow, showing 95% confidence that the population slope is between .65 and 1.09 ($F(1,108) = 59.91, p < .001, R^2 = .35$) (BID, $\beta = .58, p < .001, CI(95\%) .65 - 1.09$).

Similarly, a linear regression carried out on the effect of BID on levels of stress revealed a significant correlation which was moderately strong (Multiple $R = .58$). It was found that for every 1 score rise in BID, stress levels increased by .85. Confidence levels were also narrow, showing 95% confidence that the population slope is between .62 and 1.08 ($F(1,108) = 53.24, p < .001, R^2 = .32$) (BID, $\beta = .58, p < .001, CI(95\%).62 - 1.07$). The findings indicated that BID can predict levels of DASS in patients and the null hypothesis was therefore rejected.

Table 3 *Linear regression of the effect of BID on DASS*

Variable	Mean	SD	Adjusted R ²	β	p
Depression	18.90	13.28	.37	.61	.000
Anxiety	15.40	12.40	.35	.90	.000
Stress	20.33	12.41	.32	.58	.000

A multiple regression was carried out to establish the reverse effect, whether DASS could be a predictor of BID. A significant association was found and was of moderate strength (Multiple R = .58). The results showed that the 3 variables accounted for 39% of the variance ($R^2 = .39$, $F(3,104) = 24.00$, $p < .001$). The findings revealed that depression significantly predicted BID ($\beta = .39$, $p = .011$, 95% CI = .06 - .43) as did anxiety ($\beta = .30$, $p = .026$, 95% CI = .03 - .38). As both confidence intervals do not contain a negative values the population regressions coefficients for both depressions and anxiety are positive. In contrast the findings show that stress did not significantly predict BID ($\beta = -0.2$, $p = .910$, 95% CI = -.23 - .204). Figure 3 below displays a somewhat normal distribution of BID scores on a histogram and figure 4 displays a positive relationship on a scatter plot.

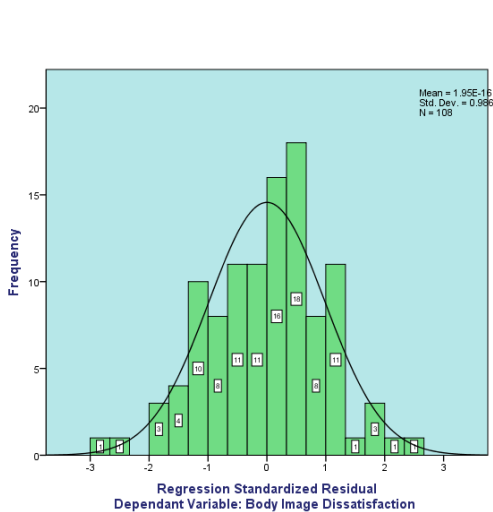


Figure 3 *Histogram of DASS effect of BID*

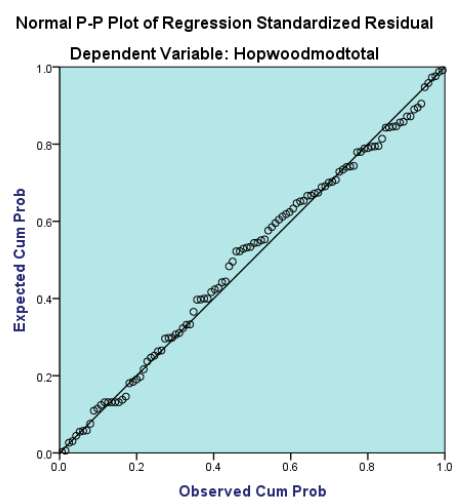


Figure 4 *Plot of DASS effect of BID*

In order to determine the effect of a change in BID levels on subjective happiness levels, a linear regression was carried out. While the correlation between the predictor variable BID and the criterion variable subjective happiness was weak (Multiple $R = .39$), a significant association was found. The results revealed that for every 1 score rise in BID, happiness levels decreased by $-.25$. Confidence levels were narrow showing 95% confidence that the population slope is between $-.36$ and $-.14$, ($F(1,109) = 19.84$, $p < .001$, $R^2 = 1.5$) (BID, $\beta = .39$, $p < .001$, CI (95%) $-.36 - -.138$). Thus the null hypothesis was rejected.

3.3. *Qualitative Results*

Question a.

The responses to all 4 open-ended questions were gathered and analysed. A total of 97 participants responded to question a; “Are you concerned about the appearance of some part(s) of your body, which you consider especially unattractive? What are these concerns?” Responses were first categorised into groups that did or did not have concerns. It was found that 71.1% of patients ($n = 69$) did have concerns about the appearance of their body, the further 28.9% of patients ($n = 28$) were found to have no concerns. On analysis of the responses, two main themes suggested concern with the appearance of the patient’s stomach or abdominal area and concerns over bodyweight. Thirty percent of patients ($n = 37$) reported concern over the appearance of their stomach in relation to either bloating ($n = 16$) or scarring after surgery ($n = 23$). Patients reported that they experienced “terrible bloating, weight gain from medication. Stomach has doubled in size just makes me feel like a lump” and “the scar is very long and unsightly, used to have a flat stomach now there's always a bulge. The stomach bag is very unattractive and I worry about it showing. Respondents also displayed concerns relating to their weight ($n = 25$), this included been both overweight ($n = 13$) and underweight ($n = 12$). Patients reported to be “concerned that it’s hard to lose weight due to the meds” and

that "weight loss during my last flare has made me feel less of a woman. ", "my whole body appears emaciated".

Question b.

A total of 94 participants responded to question b; "What effect has your preoccupation with your appearance had on your life?" All responses were analysed and coded into groups were the preoccupation with appearance did or did not have an effect on the patient's life. The responses displayed revealed that 19.2% of patients reported that the preoccupation with their appearance had little or no effect on their life (n = 18) however, a large number of respondents, 80.8% (n = 76) reported that the disease did have an effect on their life. The main themes emerging from the patient responses displayed a tendency to avoid social interactions, concerns over general appearance, less confidence and low levels of self-esteem. Twenty-six percent of respondents (n = 25) tended to avoid social situations and social interaction with others reporting that "I have isolated myself. I suffer from depression. I have lost confidence and have no social interaction". Others concerned over their appearance (n = 25) "worry that other people are judging me solely on my appearance and also that people treat my illness as a joke because I don't look sick". In relation to confidence, patients reported that the disease "diminishes your confidence" with some (n = 12) reporting that the disease "has affected my relationships".

Question c.

All responses (n = 105) to question c; "Has the physical effect of your disease significantly interfered with your college work, your job, or your ability to function in your role? If so, how?" were initially categorised into two groups based on whether the patients ability to function in a role was interfered or not. The disease was found to interfere in 74.3%

(n = 78) of respondents role function. This interference was seen in varying levels, some patients reporting that “I now work part time as I get tired after just a few hours work” with others reporting “I am unable to work. Have lost many jobs due to lack of understanding.” From the 78 respondents that reported an interference in the role function, 19.0% (n = 20) referred to fatigue as being a contributory factor reporting been “tired, lack of energy and concentration” and that “the fatigue sometimes made it impossible to get out of bed, missing work, it also made it very difficult to concentrate and undertake even simple tasks when I was there“.

Question d.

The 98 responses to question d; “Do you ever avoid things because of the physical effect of your disease? If so, what do you avoid?” were analysed and coded into groups based on the patient’s tendency to avoid situations or not. The results displayed that a large proportion, 82.7% (n = 81) of respondents avoided situations or things due to the physical effect of the disease. The main themes from the responses displayed that 43.9% (n= 43) of patients avoided social situations such as travel and events with patients reporting “I avoid allot“ and “I would find myself avoiding everything from shopping trips, eating out, exercise classes to walks”. The avoidance of physical exercise such as water and contact sports was also prevalent in 29.8% (n = 29) of respondents reporting that they avoid “swimming, most exercise” or “sports, water sports and contact sports”.

4. Discussion

Patients of IBD experience and live with the debilitating and embarrassing symptoms of this chronic disease. This study sought to gain a deeper understanding as to how the physical effects of IBD and the treatment used in the management of IBD affect patients. The aim of this study was to examine the association between BID in patients of IBD in Ireland with factors relating to the disease and patients emotional states. This study aspired to establish a relationship between disease type and activity, drug and surgical treatment types, the age and length of diagnosis in patients of IBD with levels of body image dissatisfaction. This study also aimed at establishing an association with body image dissatisfaction with levels of depression, anxiety, stress and general happiness in patients with IBD. The results of this study found a difference in BID in patients in relation to disease type and disease activity. The age and length of disease diagnoses however were not found to be a predictor for BID in patients. The use of cortisol steroids in the treatment for IBD was found to predict levels of BID, contrastingly surgery was not. Levels of BID were found to predict levels of depression, anxiety and stress in patients and conversely depression and anxiety levels in patients were found to predict BID. BID was also found to predict levels of subjective happiness.

It was hypothesised that disease type and disease activity would be associated with levels of BID in patients with IBD. In contrast to the findings of previous research by McDermott et al. (2015) it was found that patients with Crohn's disease had a significantly higher level of BID than those with Ulcerative Colitis. In 2015, within a larger sample size, McDermott et al. found similar levels of BID in patients of Crohn's and Ulcerative Colitis. A larger sample size and a more balanced mix of patients with Crohn's and Ulcerative Colitis

may account for the varied result and further research would be beneficial to support and understanding this relationship. In relation to disease activity McDermott et al. (2015) found BID levels in patients of both mild and moderate to severe disease activity to be twice the level found in patients in remission. Similarly, the results of this current study revealed that moderate to severe disease activity in patients displayed significantly higher levels of BID, this difference however was found when compared to both inactive and mild disease activity. As disease activity increases, symptom severity increases, understandably resulting in increased levels of BID. These findings also supported previous research by Saha et al. (2015) where greater disease activity was associated with BID.

It was also postulated that the age and length of diagnosis in patients with IBD would predict levels of BID. In contrast to previous research there was no association found with age and length of disease diagnoses and levels of BID in patients. Pinquart and Shen (2011) found that BID levels varied depending on the age of disease onset. While the results of this current study showed a non-significant result with regards to the age of diagnoses, the result were not far off and additional research with a larger sample size may be of benefit to confirm the findings.

In considering the 4 various drug treatments patients were undertaking for IBD, it was hypothesised that drug treatment type would predict levels of BID in patients. As expected it was revealed that the drug treatments aminosalicylates, immunomodulators and biologic therapies did not predict levels of BID in patients. Given the physical side of effects in the use of cortisol steroids in treatment of IBD such as weight gain, it was reasonable to find that its use predicted higher levels of BID in patients, therefore supporting previous research by McDermott et al. (2015). It was also hypothesised that surgical treatment would be associated

with levels of BID however there was no association found in patients who had undergone some form of surgical treatment. These findings are not consistent with prior research (Dunker et al., 1998; McDermott et al., 2015) whereby significant differences in body image were displayed in surgical treatments. The study carried out by Dunker et al. (1998) focused only on patients of Crohn's disease that had undergone laparoscopic-assisted or open ileocolic resections whereas the research conducted by McDermott et al. (2015) compared BID in patients who had undergone no surgery, stoma forming and non-stoma forming surgery in all forms of IBD. Further research based on similar group comparisons would provide better support to this theory.

It was predicted that levels of BID in patients of IBD would predict levels of depression, anxiety and stress. Former research revealed an association in BID with high levels of anxiety (Bannaga & Selinger, 2015; McDermott et al., 2015) and high levels of depression in patients (Greenley et al., 2010; McDermott et al., 2015). The results of this current study provided support for these aforementioned studies with levels in all 3 negative emotions, depression, anxiety and stress increasing as BID levels increased. Interestingly, in testing the reverse association of whether levels of depression, anxiety and stress predict levels of BID, a positive association was found. A closer examination of this correlation revealed that both depression and anxiety predicted levels of BID whereas stress did not, thus creating a bi-directional relationship.

It was also theorised that BID would predict levels of general happiness in patients of IBD. While a negative association was found between BID and general happiness (as BID increased levels of general happiness decreased) this correlation was weak. When BID

increased general happiness levels were found to decrease at a slower pace when compared to the rate of increase found in depression, anxiety and stress.

It was postulated that patients would have concerns over body parts and general appearance and that these concerns interfered with some aspects of the patients day to day life. Patients of IBD experience embarrassing and uncomfortable symptoms such as abdominal pain, diarrhoea, weight loss (Maddux et al., 2013), nausea, vomiting and cramps (Treatment for IBD, n.d.). It was of no surprise to find that when questioned patients displayed concerns over the appearance of the abdominal area and body weight. These findings provide support and an understanding to the association found between disease activity and BID levels. As disease activity increases, symptom severity increases with patients reporting bloating and swelling. While there was no significant difference found in BID in patients who had undergone surgery, some patients reported concerns of scarring as a result of surgery. Patients also reported concerns of weight gain from the use of medication, in particular cortisol steroids. The qualitative data allows for a deeper understanding as to why the use of cortisol steroids predicts higher levels of BID and adds further support to the suggestion that longer use of steroid treatment increases BID (Saha et al., 2015).

The majority of patients proposed that the effects of IBD had an effect and interfered with the patient's life and general functioning. Patients displayed a tendency to avoid social interactions, social situations and reported low levels of confidence and self-esteem. Greenley et al. (2010) suggested higher levels of depressive and internalising disorders with lower reporting of psychosocial functioning in patients with IBD. This was also evident in the interference patients displayed in the ability to function in a role. Patients revealed that the symptoms of IBD affected the ability to work and attend college. Fatigue, embarrassing

symptoms and lack of understanding were reported as the main contributing factors. Additionally, patients indicated that the physical effect of the disease has led to the avoidance of situations and participation in activities, examples given included travel, eating out, swimming, exercise and contact sports. These findings correspond with previous research where patients were found to have reported psychological and social consequences and reported an interference with social and personal activities including sports (McDermott et al., 2015).

4.1. Strengths and Weaknesses

The outcomes of this study are a result of a carefully planned and executed research design. Personal experience with IBD provided direct access to patients through on-line support groups and allowed for an understanding, sensitivity and empathy towards patients. The large number of responses to the questionnaire would not have been achievable without the positive support and encouragement from the various on-line support groups. The close network of support between patients with IBD was evident and the willingness to share experiences and the effects, both good and bad, of living with IBD for the purposes of research was greatly received. As a result of familiarity with medical teams involved in the treatment programmes of patients with IBD access was provided to previous research studies that may have otherwise been difficult.

It was made possible to reach participants from all areas of Ireland and Northern Ireland by sourcing participants through online resources. The participants were from diverse social and economic backgrounds. Responses were also received from a wide age range; 18 years to 67 years. It has been shown that accessing samples through online sources such as Facebook provides a fast response speed and a wide reach in terms of a particular population

(Tan, 2010). Participants in previous research (McDermott et al., 2015) were sourced from an outpatient clinic of St. Vincent's hospital. While this provided direct access to patients diagnosed with IBD, adherence to medical therapies for chronic illness remains an issue, Sabaté (2003) states that worldwide adherence levels in developed countries average at 50%. Non-compliance rates are believed to be higher in younger adults and adolescents who are more prone to act on "health-risk behaviours" (Michaud et al., 2007). Given that the age of onset for IBD peak between the ages of 15 years and 35 years (Treatment for IBD, n.d.) accessing a sample from an outpatients clinic only may limit the demographics of the sample.

In terms of weaknesses in this current study, there are a number of points worthy of discussion. While the sample size for this study was sufficient there were more female participants than males. The findings may suggest that males are not as actively engaged in on-line support groups or may not be as open to sharing individual experiences with IBD as females. Further investigating into the responses from females and males would identify any difference in effects of IBD and establish if a more balanced sample is required in further research.

While accessing a sample from on-line support groups is seen as a strength it may also be grounds for some limitations. Unless a participant was scoured through snowball sampling a computer or smart device and an internet connection was required to access the questionnaire, without these individuals could not participate. It could also be suggested that a sample scoured from on-line support groups only provides access to those patients that are actively seeking support and practice adaptive coping strategies.

Body image relates to an individual's sense of their own personal appearance and this according the McDermott et al. (2015) begins to form in childhood and continues to develop through adolescence and young adulthood. It cannot be ruled out that sources of BID can be a consequence of other factors in patients with IBD. Our perception of our bodies and levels of body image satisfaction or dissatisfaction can be altered by both psychological and physical factors, body mass index, health concerns outside of IBD, environmental influences are all extraneous variables to be considered when measuring BID.

4.2. Implications

There are a number of implications to be considered as a consequence of this study ranging from management of patient treatments plans and setting a platform for further research. The findings in the study have suggested a correlation between factors of IBD with higher levels of BID in patients. These findings having supported former research give rise for the need of further investigation. The ability to identify predictor variables and how they affect the patients of IBD will allow for better planning and interventions when managing individual patient treatment programmes. The qualitative aspect of this study also gives a deeper insight as to how or why some of these variables may produce higher levels of BID. These patient reports build an awareness of the individual struggles encountered living with IBD and the effect this disease has on the patients functioning. The findings and further investigations into how and what causes BID in patients can be used in considering and developing treatment or disease management plans for patients of IBD.

The finding that BID predicts DASS and conversely that levels of depression and anxiety predict levels of BID suggest the existence of a bi-directional relationship. There is an increasing need for multidisciplinary treatment approach to IBD involving psychologists

and medical physicians (Bannaga & Selinger, 2015). Psychosocial support in patients with IBD near the time of diagnosis alongside traditional medical support (Bannaga & Selinger, 2015; Maddux et al., 2013) will take into account the patients overall functioning, adjustment and quality of life. Providing education to medical providers on the impact of psychological factors and health outcomes of IBD on patients can guide health promotion, early intervention and demonstrate how psychology can positively affect patient care (Maddux et al., 2013). Given the negative emotions experienced by patients and how these have shown to interfere with patient functioning on a daily basis, there is a need to address these psychological issues to improve the patients well-being and disease management.

4.3. Future Research

While the number of participants recruited for this study reached the required number, further research with a larger sample size would provide support and provide scope for a more comprehensive result. Further in-depth qualitative studies would also provide a deeper understanding of the individual patient experiences and perceptions. This current study established that BID predicted subjective happiness however a further study to establish if a bi-directional association between subjective happiness and BID would be of interest.

The results of this study and patient reports suggest that multidisciplinary treatment programmes are required in the management of the IBD. Longitudinal studies with the introduction of a psychologist as part of a treatment plan could be carried out providing education to the patient in respect of the negative emotions experienced while living with IBD. The psychologist would provide counselling, coping and disease management strategies. The implementation of a control group would allow for comparisons of BID, DASS and subjective happiness found before and after treatment. This would establish if

education about the effects of IBD, informed coping and disease management skills could improve the patients overall quality of life and well-being while living with this chronic disease.

4.4. Conclusion

The results of this study revealed a difference in BID in patients with Crohns' disease, moderate to severe disease activity and the use of cortisol steroids in the treatment of IBD. Surgery, the age and the length of disease diagnosis were not found to predict BID. It was also revealed that BID predicted DASS and in a bi-directional relationship depression and anxiety predicted BID. Stress was not found to predict BID. BID was also found to predict subjective happiness in patients of IBD. Qualitative findings demonstrated how the effects of living with IBD can interfere with the patients general functioning and day-to-day life. These findings have implications for future studies and should be considered in managing patient treatment programmes.

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6. Appendix

A. Demographic Questions; Methods section - Materials

What age are you? ____ yrs What sex are you? Male ____ Female ____

What do you weigh? ____ lbs What height are you? ____cm

B. Disease History; Methods section - Materials

What type of Inflammatory Bowel Disease have you been diagnosed with?

Ulcerative Colitis _____ Crohn's _____

What age were you when you were diagnosed? _____ yrs

How long have you been diagnosed with IBD? _____ yrs

C. Disease Activity Index; Methods section - Materials

How would best describe your current disease activity? Please tick one option.

Inactive _____ Mild Activity _____
Moderate Activity _____ Severe Activity _____

D. Drug Treatment Type; Methods section - Materials

Please tick the drug treatments you are currently following for your disease;

Aminosalicylates (5-ASA) e.g. Salazopyrin, Asacoln, Pentasa, Salofalk

Cortisol Steroids e.g. Prednisolone, Budesonide, Methylprednisolone

Immunomodulators e.g. Purinethol, Azathioprine, Methotrexate, Ciclosporin

Biologic therapies e.g. Remicade (Infliximab), Adalimumab (Humira)

E. Surgical Procedures; Methods section - Materials

Have you undergone surgery as a treatment for you IBD? Yes ____ No ____

If Yes, please indicate by ticking what type of surgery you have undergone.

Bowel resection/Non-Stoma forming Surgery _____

Stoma Forming Surgery/Total colectomy _____

Pouch Construction Surgery _____

F. Modified Hopwood Body Image Scale; Methods section - Materials

BODY IMAGE SCALE

In this questionnaire you will be asked how you feel about your appearance, and about any changes that may have resulted from your disease or treatment. Please read each item carefully, and place a tick on the line alongside the reply which comes closest to the way you have been feeling about yourself, during the past week.

Not at all A little Quite a bit Very much

Have you been feeling self-conscious about your appearance?

Have you felt less physically attractive as a result of your disease or treatment?

Have you been dissatisfied with your appearance when dressed?

Have you been feeling less feminine/masculine as a result of your disease or treatment?

Did you find it difficult to look at yourself naked?

Have you been feeling less sexually attractive as a result of your disease or treatment?

Did you avoid people because of the way you felt about your appearance?

Have you been feeling the treatment has left your body less whole?

Have you felt dissatisfied with your body?

Have you been dissatisfied with the appearance of your scar?

Responses were scored as follow; Not at all = 0, A little = 1, Quite a bit = 2 and Very much = 3. The scores for each response were summed to produce an overall score for each participant. The lowest possible score was 0 and highest possible score was 27. A

score of zero represents no body image dissatisfaction or distress whereas the higher scores indicate increasing levels of body image dissatisfaction or distress.

G. Cash Body Image Disturbance open-ended question; Methods section - Materials

A. Are you concerned about the appearance of some part(s) of your body, which you consider especially unattractive? What are these concerns?

B. What effect has your preoccupation with your appearance had on your life?

C. Has the physical effect of your disease significantly interfered with your college work, your job, or your ability to function in your role? If so, how?

D. Do you ever avoid things because of the physical effect of your disease? If so, what do you avoid?

H. Depression, Anxiety and Stress Scale (DASS); Methods section - Materials

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

1 I found it hard to wind down	0	1	2	3
2 I was aware of dryness of my mouth	0	1	2	3

3 I couldn't seem to experience any positive feeling at all	0	1	2	3
4 I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5 I found it difficult to work up the initiative to do things	0	1	2	3
6 I tended to over-react to situations	0	1	2	3
7 I experienced trembling (eg, in the hands)	0	1	2	3
8 I felt that I was using a lot of nervous energy	0	1	2	3
9 I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10 I felt that I had nothing to look forward to	0	1	2	3
11 I found myself getting agitated	0	1	2	3
12 I found it difficult to relax	0	1	2	3
13 I felt down-hearted and blue	0	1	2	3
14 I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15 I felt I was close to panic	0	1	2	3
16 I was unable to become enthusiastic about anything	0	1	2	3
17 I felt I wasn't worth much as a person	0	1	2	3
18 I felt that I was rather touchy	0	1	2	3
19 I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20 I felt scared without any good reason	0	1	2	3
21 I felt that life was meaningless	0	1	2	3

DASS Scoring Template;

	S
	A
	D
	A
	D
	S
	A
	S
	A
	D
	S
	S
	D
	S
	A
	D
	D
	S
	A
	A
	D

The scoring template was designed to be copied onto an overhead transparency (i.e., plastic film) so that it can be placed on top of the completed questionnaire.

The template indicates which items belong to which scale. Just add up the scores for all of the items in each scale.

The short DASS (21 items) there will only be 7 items per scale so you will only apply the scoring template to the single sheet; however you will then need to multiple the score you obtain for each scale by 2 in order to make it comparable to the corresponding full DASS score (and the DASS norms and published studies).

DASS Score Guideline

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

I. Subjective Happiness Scale (also known as General Happiness Scale) ; Methods section - Materials

Instructions: For each of the following statements and/or questions, please circle the point on the scale that you feel is most appropriate in describing you.

1. In general, I consider myself:

not a very happy person 1 2 3 4 5 6 7 a very happy person

2. Compared to most of my peers, I consider myself:

less happy 1 2 3 4 5 6 7 more happy

3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?

not at all 1 2 3 4 5 6 7 a great deal

4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?

not at all 1 2 3 4 5 6 7 a great deal

Scoring: Reverse the scores on question 4. Sum the scores for each item together.

J. Group Contact Details; Materials Section – Procedure.

1. Crohn's and Ulcerative Colitis Ireland Facebook Page

Moderators; Andrea Owens and Allan Mathews

Facebook page address; [crohnsandulcerativecolitisireland@groups.facebook.com](https://www.facebook.com/groups/crohnsandulcerativecolitisireland/)

2. Crohn's and Colitis UK – Northern Ireland Group

Vice-Chair; Audrey Derby

Email; NI@groups.crohnsandcolitis.org.uk

3. Let's Talk Crohn's and Colitis Northern Ireland (LTCCNI)

Moderator; Orla

Email; ltccni@hotmail.com

K. On-line Cover Letter including Consent; Methods section - Procedure

Body Image Dissatisfaction in Patients with IBD

The purpose of this research project is to gather experiences directly from people who are currently dealing with the effects of Inflammatory Bowel Disease (IBD) in the form of Ulcerative Colitis or Crohn's Disease.

The aim of this study is to examine the association between Body Image levels in patient with IBD with factors relation to their disease and treatment.

You are invited to take part in this study as a diagnosed patient of IBD. All participants must be 18 years of age or older with no learning disabilities. Your participation in this study is voluntary. You may choose not to participate. If you decide to participate in this study, you may withdraw at any time.

The questionnaire will take approximately 20 minutes to complete. Your responses will be confidential and identifying information will not be collected. The survey questions will be about your experiences with IBD. All data will be stored in a password protected electronic format. After data has been collected you will be unable to withdraw your data as it will be anonymous.

Some participants may be sensitive to some of the questions within this questionnaire. If you find some questions difficult or distressing to answer and would like to speak to someone regarding your concerns the Irish Society for Colitis and Crohn's Disease can be contacted at (01) 872 1416, alternatively they can be emailed through their website www.iscc.ie.

This research project is being conducted by Caroline Walsh at Dublin Business School (DBS) in accordance to the DBS Ethical Guidelines. If you have any questions about this research study or concerns, please contact Caroline Walsh at carwalsh@gmail.com.

Many thanks for your time and participation.

I consent to participate in this research study on Inflammatory Bowel Disease.

I am 18 years of age or older