

**Correlation between Stress, Self-efficacy, Coping  
and Stages of Crohn's disease in male and female  
patients.**

**Olesja Darnopiha**

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*Supervisor: Dr. Pauline Hyland*

*Head of Department: Dr. Sinead Eccles*

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*Department of Psychology*

*DBS School of Arts*

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## **Abstract**

The purpose of this study was to explore the relationship between Crohn's disease activity and three psychological variables: perceived stress, coping strategies and self-efficacy. The sample consisted of 102 volunteers (N=102) recruited through the Irish Society of Ulcerative Colitis and social media forums. The participants were asked to complete an online self-report survey consisting of Perceives Stress Scale, Brief COPE scale and Generalized Self-Efficacy scale. Statistical analyses demonstrated significant results between the use of maladaptive coping strategies and the disease activity. There was negative significant correlation between stress and self-efficacy and positive significant correlation between stress, behavioural disengagement and self-blame. However, no other significant correlations were observed. Therefore, it was concluded that large sample controlled studies are needed to further investigate the role of perceived stress, coping and self-efficacy in patients with Crohn's disease.

## 1. Introduction

*“Allow me to feel your pain, allow me to walk talk, I am only human but I know one day I will be near you. I will feel your love, I will feel your touch; this day will come sooner than you know, sooner than this bridge of light”* (Pelinku 2010, p. 123)

Inflammatory Bowel Diseases (IBD) - Ulcerative Colitis and Crohn’s Disease- are chronic diseases of the gastrointestinal tract. Onset may occur at any time of life, with higher incidence of onset reported between 15 and 35 years of age. Symptoms of IBD vary depending on severity, and may include abdominal pain, diarrhoea, weight loss and fatigue (Walker, Gelfand, Gelfand, Creed and Katon, 1996). IBD inevitably affects patients’ quality of life including education and career prospects, as well as romantic and other relationships (Martin, Leone, Fries, Naccarato, 1995) and psychological well-being (Hall, Rubin, Dougall, Hungin, Neely, 2005). Crohn’s disease is considered to be unpredictable in the long-term (Baldassano, Han, Jeshion, Berlin, Piccoli, Lautenbach, Mick, Lichtenstein, 2001).

Traditionally the research focus has been primarily on treating and finding a cure for physical symptoms. However, very little attention has been brought to patients’ subjective experiences of health (Kjeldsen, Schaffalitzky, de Muckadell, 1993) and psychological issues (Voth & Sirois, 2009). Even though most patients suffering from IBD lead a normal social, professional and family life, their quality of life inadversely affected as the disease and its symptoms are central stressors (Joachim & Milne, 1985; Garrett & Drossman, 1990).

A more comprehensive holistic approach to research in IBD should be promoted by including the measures of patient's perception and experience of the disease. This would result in deepening the understanding of patient's global situation and contribute to improved patient care.

The aim of this study to assess stress levels in patients with Crohn's disease in a cross-cultural sample and explore its relationship with other two variables: coping strategies and self-efficacy. The study will also investigate the contribution of the demographic variable of gender.

This chapter reviews the hitherto published research in the field of IBD with a particular emphasis on Crohn's disease and the psychological aspects the IBD patients' experience. The limitations and constraints of the research are discussed, from which the rationale for this research is derived. The introductory chapter concludes with presenting the hypotheses tested in this study.

### **1.1 Crohn's Disease – Symptoms, Course and Treatment**

Crohn's disease is a chronic, recurrent inflammatory condition of the gastrointestinal tract, one of the Inflammatory Bowel Disease group (Rocchi, Benchimol, Bernstein, Bitton, Feagan, Panaccione, Glasgow, Fernandes, Ghosh, 2012). The inflammation can extend on to any part or the whole of the digestive system from the mouth to the rectum. Crohn's disease can be characterized by a sequence of flare-up episodes and remissions. Even though some patients may experience symptom-free periods for months or years, the disease tends to become active again at some point (Crohn's & Colitis Foundation of America, 2009).

Despite progress made in understanding the disease, its aetiology remains unknown. Prevalence of the disease has increased over the past decades (Cosnes, Gowerrousseau, Seksik, Cortot, 2011). The incidence is 1 per 100,000 (but probably increasing) in Asia and South America; 1–3 per 100,000 in southern Europe and South Africa; 16 per 100,000 in New Zealand and Australia; 14 per 100,000 in Canada; and 7 per 100,000 in the USA (WGO, 2009).

The symptoms vary from diarrhoea, abdominal pains, nausea, and fever, loss of appetite, weight loss, fatigue and rectal bleeding. The symptoms fluctuate in the intensity from mild to severe and the course of the disease varies from patient to patient (Lichtenstein, Hanauer, Sandborn, 2009). Malnutrition is common among patients with Crohn's and may occur predominately from the avoidance of eating to evade abdominal cramps and diarrhoea. People diagnosed with Crohn's may experience urgent bowel movements coincided with abdominal pain (CCFA, 2009; Levine, 1994).

There is no cure for Crohn's disease (NIDDK, 2006). The symptoms can be reduced and subsequently controlled with various medications or a combination of those. The medication varies from anti-inflammatory therapy (corticosteroids) to immune-modulatory treatment (anti-TNF $\alpha$ ) (Srinivasan, Chinyu, Lichtenstein, 2003). In case where medication is ineffective, and the disease results in severe complications, such as forming of fistulas, surgery may become necessary (Lichtenstein et al., 2009).

## **1.2 Recent Research on IBD**

Crohn's disease and ulcerative colitis are illnesses in the Inflammatory Bowel Disease category. For reasons of sample availability therefore, many research studies tend to examine the two conditions together, which is somewhat limiting. Some findings indicate Crohn's disease being more severe (Farmer, Easley, Farmer, 1992;

Drossman & Ringel, 2004; Mikočka-Walus, Turnbull, Andrews, Moulding, Wilson, Harley, Hetzel, Holtmann, 2008) and resulting in increased anxiety, depression and panic disorder (Tarter, Switala, Carra, Edwards, Van Thiel, 1987).

Current research on psychological aspects of Inflammatory Bowel Disease suggests compromised psychological functioning in those affected (Sewitch, Abrahamowicz, Bitton, Daly, Wild, Cohen, Katz, Szego, Dobkin, 2001). The nature of the disease requires adequate coping strategies and adaptation for the patients to be able to adjust to the life style change. It has been revealed that psychological distress caused by the symptoms of the disease leads to elevated stress levels (Sewitch et al., 2001). Further research in the area suggests Inflammatory Bowel Disease as an indicator of significantly lower quality of life (Farmer et al., 1992) and greater preference to passive coping mechanisms (Jones, Wessinger, Crowell, 2006).

Sainsbury and Heatley (2004) in their review of psychological factors affecting the quality of life in patients with IBD, found that females have lower scores in both control and IBD patients group. According to the study, this might be related to the perception and rating of the disease symptoms as well as greater disease related anxieties. However, further investigation is needed into the choice of coping strategies as an indicator of the overall adjustment to the illness.

The research literature also suggests the level of disease activity (flare or remission) being one of the factors affecting quality of life (Haapamaki, 2001; Albersnagel & Dijkstra, 2007; Vidal, Gomez-Gil, Sans, 2008); however, none of the studies investigated the relationship between the stages of the disease and potentially compromised self-efficacy in patients affected.

### **1.3 Crohn's and Psychosocial Factors**

Some research examined the relationship between the stages of the disease and psychological well-being of the patients and found increased levels of anxiety in IBD patients in comparison to controls (Addolorato, Capristo, Stefanini, Gasbarrini, 1997; Casellas, Lopez-Vivancos, Casado, Malagelada, 2005; Kurina, Goldacre, Yeates, Gill, 2001; Porcelli, Taylor, Bagby, De Carne, 1996). Other studies arrived to conclusion that the daily hassles have an impact on exacerbation of the symptoms and increased disease activity (Sainsbury et al., 2005; Mikocka-Walus et al., 2007). It is, however, important to note the limitations of the cross-sectional research outlined above due to the lack of control groups.

To compensate for these shortcomings, a number of longitudinal studies have been conducted. Their findings suggest that depressive moods and anxiety can be major factors in relapse and triggering the activity of the disease (Mardini, Kip, Wilson, 2004; Mittermaier, Dejaco, Waldhoer, Oefflerbauer-Ernst, Miehsler, Beier, Tillinger, Gangl, Moser, 2004). Mardini et al. (2004) followed 18 patients with Crohn's for 2 years. Their findings demonstrate significant relationship between depression and disease activity. Similar research was conducted by Mittermaier and colleagues (2004) who recruited larger sample of Crohn's patients (n=47) and followed them for 18 months. They suggested psychological distress as a potential factor to identify patients with higher risk of relapse. The above studies illustrate the importance of psychological factors in the activity of the disease. Further investigation is needed to establish the role of psychological variables and the disease's influence on them.

Other researchers have reported that patients with Crohn's demonstrate more concerns and worries linked the unpredictable nature of the disease as well as low energy levels (Drossman, Leserman, Mitchell, Zagami, , 1991; Moser, Tillinger, Sachs, Genser, Maier-Dobersberger, Spiess, Wyatt, Voegsang, Lochs, Gangl, 1995).

#### **1.4 Perceived Stress in Patients with Crohn's**

According to Lazarus (1966) stress is a condition or feeling experienced when a person perceives that demands exceed the personal and social resources the individual is able to mobilize. The cognitive-transactional theory of stress is the most widely used by health psychologists (Keefer et al., 2008). It allows wide range of variation of coping resources (Lazarus & Folkman, 1984). Therefore, examination of stress variable should be in conjunction with coping variable.

Another perspective on stress is described in stress and illness theory of Hans Selye (1956; 1993). His theory is based on the reaction of sympathetic nervous system known as 'fight-or-flight response'. This definition is commonly used in medical stress research (Keefer et al., 2008). The measures include questions about symptoms, emotions, physiological fluctuations and behaviours linked with a stressor.

Early research on gastrointestinal diseases suggested strong relationship between stress and the onset and maintenance of the disease (Levenstein, Prantera, Varvo, Scibano, Berto, Andreoli, Luzzi, 1994; Garrett, Brantley, Jones, McKnight, 1991; Levenstein et al., 2000; Traue & Kosarz, 1999). The evidence, however, was insufficient, as highlighted by Keefer, Keshavarzian and Mutlu (2008). Moreover, it is important to note the limitations of the early studies conducted, due to them being uncontrolled and based on the subjective assumption that stress is directly linked to the intestinal inflammation.

Undoubtedly, the onset and development of Crohn's can cause a wide range of psychological concerns in patients. Among them is the loss of control of bowel movement, malnutrition, anaemia and fatigue, significant loss of weight, which can result in low self-esteem associated with sexual inadequacy and dependency on others

(Drossman & Ringel, 2004). Moreover, symptoms like faecal incontinence and lack of bowel control can lead to patient's isolation and reluctance to participate in social activities (Sajadinejad et al., 2012).

Several studies have emphasized the role stress plays in the development and the course of the disease (Mardini et al., 2004; Mittermaier et al., 2004; Greene, Blanchard, Wan, 1994). However, research findings (Levenstein et al., 1994, 2000; Greene et al., 1994) are somewhat controversial and conflicting due to different definitions of stress. While it is not clear whether stress is a causal factor in the onset of Crohn's, several studies confirmed its effect on exacerbation of symptoms and onset of flare-up (Camara et al., 2009; Maunder et al., 2008; Hisamatsu et al., 2007; Drossman et al., 2004). It is important to note that most of the studies investigated the effect of the stressful events on the course of the disease as opposed to the disease being the stressor.

Drossman (2000) in his review of psychosocial issues confirms the relationship between stress, coping, and disease activity. He concluded that increased stress levels are associated with more acute disease episodes. He also reported problem-solving coping strategies associated with lower stress and overall improved health than with avoidant coping techniques.

Despite identical physical symptoms, the perception and response to the disease by patients will vary depending on social context, sociocultural beliefs and values related to the illness and hence differences in choice of coping mechanisms (Levenstein, , Zhiming, Almer, Barbosa, Marquis, Moser, Sperber, Toner, Drossman, 2001).

While there is some empirical data to support the effects of stress on the activity of IBD, the overall study findings and reports remain inconclusive. Researchers continue to face the challenge of solid conclusions as to whether or not stress plays a

central role in the inflammation in IBD (Keefer et al., 2008). To date there is no research found on the role stress has in relation to coping techniques the patients tend to use; whilst most of the reviewed literature focused on the stress being the cause of the onset and flares of the disease, this study focuses on the symptoms of the disease being the main stressor.

### **1.5 Coping Strategies in Patients with Crohn's**

Coping, according to Lazarus (1966), is constantly changing cognitive and behavioural efforts in order to manage stress. He further distinguished between problem-focused strategies when the individual takes actions against the problem and emotion-focused when the individual attempts to change the meaning of the situation. Folkman (1997) added meaning-based coping style that entails finding a positive meaning. Coping strategies can be further defined as helpful or maladaptive (Skinner, 2003). Maladaptive in this case are those that are effective short-term and hence will interfere with the ability of the patients to function at optimum level after being diagnosed (Victorson, Farmer, Burnett, Ouellette, Barocas, 2005). For example, avoidant coping strategies like behavioural disengagement, substance abuse and denial have been found to be preferred choice to cope with IBD (Van der Zaag-Loonen, Grootenhuis, Last, Derkx, 2004). Paradoxically, physicians tend to encourage their patients to limit their social activities and thus support avoidant coping (Crane & Martin, 2004). Research has also indicated that avoidant coping negatively affects adjustment to the illness (Penley, Tomaka, Wiebe, 2002). Because IBD can significantly affect physical, emotional, social, functional and economic states, it is important to understand which coping strategies are associated with illness-related stress and which supportive interventions can be implemented for those affected.

Further research evidence suggests that IBD patients rely predominantly on passive coping strategies (Jones et al., 2006; Graff, Walker, Clara, Lix, Miller, Rogala, Rawsthorne, Bernstein, 2009; Casati et al., 2000; Sainsbury et al., 2005) which lead to psychological distress and poorer adjustment to the disease. Petrak and colleagues (2001) argued that active coping techniques like confronting the illness and problem solving during the flare stage of the disease demand significant amount of energy and hence increase stress levels. The study suggests acceptance as a more beneficial coping strategy to allow physical symptoms of the illness to decrease.

Further studies have investigated coping style preference among IBD patients. Kinash, Fischer, Lukie and Carr (1993) found problem focused coping was used more frequently than emotion-focused to manage the course of IBD. Smolen and Topp (1998) reported optimistic coping strategies as the most used ones and using supportive resources was rated as the most effective approach.

According to Larsson (2007), the most frequently used coping strategies to handle the course of the disease are optimistic, self-reliant and confrontive. The same study has examined the differences between male and female patients. The results indicate that women with Crohn's disease express larger amount of stress in social situations. The stress is predominantly connected to the need to have access to the toilet, fear of losing bowel control and abdominal pain. In this qualitative study, women also communicated fears and worries of other people's perceptions which were reported as stressful.

Voth and Sirois (2009) using a sample of 165 Crohn's patients and 73 Ulcerative Colitis investigated the association between the disease activity and choice of coping strategies. The results found increased disease activity directly linked to the

increased use of avoidant coping strategies, particularly the use of behavioural disengagement. Overall the results highlight the importance of disease severity as the central factor in choice of coping strategy.

A study by Jones et al. (2006) suggests that IBD patients have higher scores on measures of psychiatric distress than controls and relied significantly less on planful problem solving and more on maladaptive strategies like escape avoidance. Graff et al. (2009) conducted a cohort study on patients with IBD and found evidence that suggests the participants with IBD have significantly poorer psychological health than those without. However, the adaptive stress-coping strategies were similar with controls. They put forward the idea that active disease phase should be a signal to consider psychological needs in the care of IBD patient.

Robertson et al. (1989) examined the existing relationship between IBD and psychological stress. His study revealed that patients themselves acknowledged this fact. He recommended that more attention to the psychological problems of the disease can improve the long term course of it. In addition, Smith et al. (2002) found maladaptive coping strategies predominantly in patients with Crohn's. Crohn's disease patients were also found to be more anxious than the controls.

Coping has received a substantial interest in relation to the adjustment to the chronic illness (Crane & Martin, 2004; Van der Zaag-Loonen et al., 2004). The strategies that individuals use to cope with the stressful experience of chronic illness have been recognized as important factor of psychological well-being (McCabe & Battista, 2004; Penley et al., 2002). This study will consider this factor and its role in the adjustment and well-being of those affected.

### **1.6 Self-Efficacy in Patients with Crohn's**

Bandura (1997) defined self-efficacy as individual's beliefs about their competence to perform certain behaviours in order to achieve a desired outcome and an important factor in coping. According to him, self-efficacy beliefs can potentially determine a number of biological processes and, as a result, influence health and the course of disease. Furthermore, self-efficacy beliefs can influence on physiological responses to stress (O'Leary & Brown, 1995).

Self-efficacy influences people's feelings, thinking and actions (Bandura, 1997). Therefore, low sense of self-efficacy can be associated with depression, anxiety and helplessness. It can, consequently, lead to low self-esteem, pessimistic thoughts about personal goals and development. Self-efficacy can either enhance or compromise the motivation to act (Conner & Norman, 1995).

Results from research into self-efficacy and chronic illnesses provide understanding of how high levels of self-efficacy play one of the central roles in stress regulation, adaptation and recovery from the disease (Bisschop, Knegsman, Beekman, Deeg, 2004; Kuijer & De Ridder, 2003). Conversely, lower levels of self-efficacy were related to anxiety and depression (Kashdan & Roberts, 2004; Faure & Loxton, 2003).

Further research in the area of self-efficacy examined the relationship between self-efficacy and various recurrent diseases like cancer, multiple sclerosis, heart disease and diabetes (Hoffman, Von Eye, Gift, Given, Given, Rothert, 2009; Airlie, Baker, Smith, Young, 2001; Sarkar, Ali, Whooley, 2009; Bernal, Woolley, Schenaul, Dickinson, 2000). The study findings linked self-efficacy with vulnerability to psychological distress when facing adversity of the disease and physical, psychological and social functioning of those affected.

Little work has been published exploring the self-efficacy in patients with IBD. Reilly, Gerlier and Brabant (2007) found more significant work impairments in patients with Crohn's as well as significant differences between patients in remission and those in a flare-up stage. The results provide an understanding of the differences of impairment Crohn's disease has particularly in a flare stage. Their study, however, focused exclusively on work performance and absenteeism. Yet it should be noted that individual coping methods and general self-efficacy may account for the results and contribute to general understanding of psychological well-being of individuals with Crohn's disease.

Despite the importance of dramatic life change accompanied with emotional distress as a consequence of Crohn's onset, relationships with self-efficacy and perceived stress measures are rarely investigated. Thus, the specific area of psychological functioning is not addressed thoroughly, particularly in patients with Crohn's disease, the progression of which is very unpredictable.

### **1.5 Summary**

A review of the research literature reveals that despite the close focus of the scientists to IBD and various studies published over the decades, the research is scarce. Because of the different definitions and scales used in research, there is no clarity in structure of the research methods. The existing studies often demonstrate conflicting results. Crohn's disease is often looked at and/or compared to Ulcerative Colitis, despite the indications of it being more severe and entailing radical life changes for those affected.

Current evidence indicates that the incidence rates of IBD have dramatically increased and with no cure currently available, the rates will continue to

grow, particularly in the Western Society (CCFC, 2012; Rocchi et al., 2012; Lichtenstein et al., 2009). While medicine is offering various treatments to manage the symptoms, the psychological health of the patients receives far less attention. Evidently, a shift needed in order to support and enable those diagnosed with IBD to lead fulfilling lives regardless the stage of the disease.

Results from previous studies on self-efficacy and chronically ill patients suggest strong correlation between high scores on self-efficacy and better psychological functioning. Previous research has suggested close relationship between high levels of self-efficacy and lower levels of stress and the relationship between self-efficacy and coping (Lazarus & Folkman, 1984). Therefore, it is important to review the role of self-efficacy in patients with Crohn's.

Potential gender differences in the course and experience of the disease were previously reviewed, but never reported empirically (Dür, Sadloňová, Haider, Binder, Stoffer, Coenen, Smolen, Dejaco, Kautzky-Willer, Fialka-Moser, Moser, Stamma, 2014). Interestingly, there are strong indications on the differences in nervous, endocrine and immune functions and management of the disease between males and females (Love, Salvante, Dale, Williams, 2008; Cutolo, Brizzolaro, Atzeni, Capellino, Straub, Puttini, 2010). A recent qualitative study by Dur et al. (2014) states there is a need for more research into the differences between male and female patients and the effects of the disease on their psychological well-being. Despite being limited by a small sample, the study demonstrated that it is self-efficacy and gender differences that need more attention in research from patient's perspective. Furthermore, the literature reviewed for this research study is not conclusive on the relationship between self-efficacy and coping strategies as well as self-efficacy and stress. Researchers recommend further research on

self-efficacy as one of the most important health determinants reported by the patients in the interviews.

## **1.6 Rationale**

One of the main trends of research to date is to compare and differentiate between Crohn's and Ulcerative Colitis (Sajadinejad et al., 2012). There is, however, evidence of Crohn's being more severe than Ulcerative Colitis. Moreover, despite both diseases belonging to the same group, the course of each one differs significantly. It should, therefore, be researched separately.

The rationale for undertaking this study is based on the idea of promoting psychological support for patients with Crohn's, particularly those severely affected or post-surgery patients. While most of the research is focused on discovering the cause and the cure for Crohn's, the fact that the patients' life is dramatically changed is overlooked.

By undertaking this study and reviewing relevant literature, the hope is to encourage further research directed at patient's psychological needs. This aim of this research is to emphasize and promote the importance of quality of life of those affected and mental support that is crucial to improve their functioning after being diagnosed and overall wellbeing.

The results of previous research (Duffy, Zielesny, Marshall, Byers, Weiser, Phillips, Calkins, Ogra, Graham, 1991; Greene et al., 1994; Garrett, Brantley, Jones, McKnight, 1991) provide some evidence on stress being potential cause for the relapse of the disease, however, very few of the studies looked at the disease and its symptoms being a serious source of stress. Hence, this study will attempt to explore whether it is the disease activity that is a causal factor of patients' stress levels. It will also examine the

choice of coping strategies while controlling for demographic factors in male and female patients.

Perceived stress, coping and self-efficacy have been previously studied both independently and in relation to other variables, but not specifically together in one study. There is a limited number of studies on psychological aspects of Crohn's disease published to date, and none in the Republic of Ireland. Therefore the purpose of this study is to look at psychological aspect of the course of the disease and suggest further research in this area.

### **1.7 Hypothesis**

This quantitative study examines the role Crohn's disease and its stages have on male and female patients. This study will seek to determine whether there is a significant relationship between perceived stress, self-efficacy, coping mechanisms and stages of Crohn's disease in male and female patients.

**H.1.** There is a significant positive relationship between perceived stress level and the disease activity.

**H.2.** There is a significant negative relationship between self-efficacy score and the disease activity.

**H.3.** There is a significant relationship between maladaptive coping strategies and the disease activity.

**H.4.** There is a significant relationship between males and females and choice of coping strategies.

**H.5.** There are significant negative relationships between stress scores to both self-efficacy and coping techniques.

## 2. Methods

### 2.1 Participants

A total of one hundred and two (n=102) respondents participated in the online survey. The participants were selected by way of an opportunistic sample. The sample consisted of 64 (N=64, 62%) females and 38 (N=38, 38%) males. The respondents included 75 Irish, 11 American, 4 British, 4 Canadian and 8 non-specified nationalities. A group of individuals in remission stage of Crohn's disease consisted of 61 (N=61, 60%) person and 41(N=41, 40%) reported to be in the flare-up stage, one person (N=1) did not specify the stage of the illness. The participants were recruited through the online support groups and message boards for people with Crohn's. Participants were included if they were over 18 years of age and self-reported having Crohn's disease. The following Internet forums were used to recruit participants: [www.crohnsforum.com](http://www.crohnsforum.com) , [www.crohnszone.org](http://www.crohnszone.org), [www.patient.co.uk/forums/discuss/](http://www.patient.co.uk/forums/discuss/), [www.ibdsupport.org/forums/](http://www.ibdsupport.org/forums/) , [www.crohns-sanity.org/forum/](http://www.crohns-sanity.org/forum/) and the following Facebook pages: Crohnies In Need (<https://www.facebook.com/CrohniesInNeed>), Wanted: Crohn's End (<https://www.facebook.com/WANTED.CrohnsEnd>) , Take Steps for Crohn's & Colitis – CCFA (<https://www.facebook.com/ccfatakesteps>), Crohn's Disease & Ulcerative Colitis Support Group (<https://www.facebook.com/crohnsdisease>), Living with Crohn's Disease: Healthline (<https://www.facebook.com/CrohnsDiseaseHealthline>), Crohn's And Me - Make The Connection (<https://www.facebook.com/CrohnsAndMe>) , Life After Crohn's (<https://www.facebook.com/lifeaftercrohns>). Irish Society of for Colitis and Crohn's Disease (ISCC) assisted in recruiting the sample by allowing access to member database. Only individuals with Crohn's disease and in the age range over 18 were asked to

participate. Each respondent was requested to complete an online survey. Participation was voluntary.

## **2.2 Design**

The current study is a cross-sectional, correlational design which is descriptive in nature. There are two independent categorical variables within this study. The first categorical variable is Crohn's disease stage: remission and flare-up. The second categorical variable is the gender of participants: male and female. Three dependent continuous variables were perceived stress, coping mechanisms and self-efficacy. The study aims to explore the relationship between stages of Crohn' disease and individuals' levels of stress, preferred coping strategies and degree of self-efficacy. It will also seek to identify the differences between male and female respondents.

## **2.3 Materials**

The methods used in this study consisted of a set of three anonymous self-administered psychometric online questionnaires. Information sheet and participant consent form was included in the beginning of the survey (see Appendix A & B). A questionnaire created by the researcher was used to report demographic variables including gender, age and nationality while participants were also asked what stage of Crohn's disease they were in (see Appendix C). The survey was built using Survey Monkey online questionnaire software ([www.surveymonkey.com](http://www.surveymonkey.com)). The data collected were then exported into Microsoft Excel and analysed. The questionnaires were used to measure participant's stress level, preferred coping strategies and self-efficacy (see Appendix A, B, C, D, E).

The *Brief COPE* (see Appendix D) is a multidimensional inventory (Carver, 1997). It is used to assess the behaviours and thoughts an individual may have in

a response to stress. This is a twenty eight item self-report instrument divided into fourteen subscales. The participants are required to rate situational questions based on their own experience. Each item scored from 1 (I haven't been doing this at all) to 4 (I've been doing this a lot) - the higher the score the greater the frequency of use of a coping strategy. The subscales consist of two items each and measure practically distinct aspects of problem focused coping and emotional coping. The subscales are: self-distraction (item 1 and 19), active coping (item 2 and 17), denial (item 3 and 8), substance use (item 4 and 11), use of emotional support (item 5 and 15), use of instrumental support (item 10 and 23), behavioural disengagement (item 6 and 16), venting of emotions (item 9 and 21), positive reframing (item 12 and 17), planning (14 and 25), humour (item 18 and 28), acceptance (item 20 and 24), religion (item 22 and 27), and self-blame (item 13 and 26). To calculate the total, the score of the items of each subscale are summed. The Brief Cope has strong internal consistency of 0.93, as assessed by Cronbach's alpha (Carver, 1997).

*Perceived Stress Scale*, designed by Cohen (1983) (see Appendix E), is used to measure perceived stress in response to a situation or an event in a person's life. The perceived stress scale (PSS) is of the most widely used psychological instruments for measuring the perception of stress (Cohen, Kamarck & Mermelstein, 1983). This 10-item scale measures the degree to which respondents perceive their lives as unpredictable, uncontrollable which constitutes stressful experience. Items were scored from 0 (Never) to 4 (Very Often). Four of the items (4, 5, 7 and 8) were reversely scored and added to the original scores of the remaining items (1, 2, 3, 6, 9 and 10). Higher scores are associated with higher levels of perceived stress and resulting in impact on everyday life. For this study, the measures possessed acceptable internal consistency with Cronbach Alpha levels exceeding a level of 0.7.

The General Self-Efficacy Scale (GSE) (see Appendix F) was developed by Schwarzer (1995). This is a 10-item scale that evaluates individual's general belief to perform well in various situations and aims to predict the ability to cope with daily hassles and adaptability to certain circumstances. Items were scored from 1 (Not at all true) to 4 (Exactly true). Final scores are summed with no recoding required. Higher scores indicated higher levels of self-efficacy. Despite being criticized for its reliability and validity, the measure is psychometrically sound instrument as demonstrated by Scherbaum, Cohen-Charash and Kern (2006). GSE has internal validity of 0.8 on average (Schwarzer & Jerusalem, 1995) and is therefore a reliable and valid instrument.

#### **2.4 Procedure**

An online survey was designed using Survey Monkey software (www.Surveymonkey.com). It included information sheet that outlined the purpose of the study and consent form. A letter of induction, outlining the research project was sent to the Committee of Irish Society of for Colitis and Crohn's Disease seeking permission to gather data through the website or Facebook page. A search using the word 'Crohn's' was performed using Facebook and Google search. A number of forums and Facebook pages related to Crohn's disease were identified. The procedure was repeated in case of online forums where the letter was sent to the forum moderators. A written note was sent to the moderators of Facebook pages outlined above. Once the permission was received from each of the parties, a message was posted on the forums and Facebook pages. ISCC sent out a newsletter containing the outline of the research project and requesting the members to participate. Once completed, the questionnaires were automatically returned and stored to the author's Survey Monkey account. The respondents were assured about the confidentiality of participation and the option to withdraw at any time should they chose so. Crohn's and Colitis Support line was provided at the end of the survey.

## **3. Results**

### **3.1 Descriptive Statistics**

Before running tests to check for significant relationships, a number of descriptive statistics were calculated to discover any trends in the scoring of different variables. A report of means (M) and standard deviations (SD) of all variables are shown in Tables 1 and 2. As can be seen in Table 1, the scoring patterns were very similar among females and males. However for some variables, difference between remission and flare stages can be observed in Table 2.

*Table 1: Means and Standard Deviations for the Predictor and Criterion Variables-**Gender*

	Gender	n	M	SD
Stress	Female	64	22.9	6.3
	Male	38	21.3	4.6
Self-Efficacy	Female	64	30.0	6.2
	Male	38	30.5	3.6
Self-Distracton	Female	64	4.7	1.9
	Male	38	4.6	1.7
Active Coping	Female	64	6.0	1.8
	Male	38	5.6	2.0
Denial	Female	64	2.9	1.6
	Male	38	2.7	1.4
Substance Use	Female	64	2.5	1.1
	Male	38	3.1	1.7
Use of Emotional Support	Female	64	4.7	1.9
	Male	38	4.7	1.6
Use of Instrumental Support	Female	64	4.7	1.7
	Male	38	4.9	1.7
Behavioural Disengagement	Female	64	3.3	1.7
	Male	38	2.7	1.4
Venting	Female	64	3.7	1.6
	Male	38	3.7	1.5
Positive Reframing	Female	64	4.6	1.9
	Male	38	4.6	2.1
Planning	Female	64	5.4	1.9
	Male	38	5.2	2.0
Humour	Female	64	4.2	2.0
	Male	38	4.5	2.0
Acceptance	Female	64	6.5	1.6
	Male	38	6.4	1.6
Religion	Female	64	3.4	1.9
	Male	38	3.7	1.9
Self-blame	Female	64	3.8	1.8
	Male	38	3.7	1.7

*Table 2: Means and Standard Deviations for the Predictor and Criterion Variables-  
Crohn's Stages*

	Crohn's Stage	n	M	SD
Stress	Remission	61	22.0	5.5
	Flare	40	22.8	6.1
Self-Efficacy	Remission	61	30.2	4.8
	Flare	40	30.2	6.3
Self-Distraction	Remission	61	4.6	1.9
	Flare	40	4.9	1.7
Active Coping	Remission	61	5.6	2.1
	Flare	40	6.3	1.6
Denial	Remission	61	2.6	1.3
	Flare	40	3.1	1.9
Substance Use	Remission	61	2.7	1.3
	Flare	40	2.9	1.5
Use of Emotional Support	Remission	61	4.3	1.7
	Flare	40	5.3	1.7
Use of Instrumental Support	Remission	61	4.5	1.7
	Flare	40	5.1	1.8
Behavioural Disengagement	Remission	61	2.7	1.3
	Flare	40	3.7	1.8
Venting	Remission	61	3.3	1.3
	Flare	40	4.4	1.7
Positive Reframing	Remission	61	4.7	2.1
	Flare	40	4.6	1.7
Planning	Remission	61	5.1	2.0
	Flare	40	5.7	1.7
Humour	Remission	61	4.0	1.9
	Flare	40	4.6	2.1
Acceptance	Remission	61	6.5	1.6
	Flare	40	6.4	1.7
Religion	Remission	61	3.6	1.9
	Flare	40	3.4	1.9
Self-blame	Remission	61	3.4	1.5
	Flare	40	4.2	2.0

### 3.2 Inferential Statistics

The main hypothesis of the research project was to examine the relationships between perceived stress, self-efficacy, coping mechanisms and stages of Crohn's disease in male and female patients. It was hypothesized that patients in a flare stage will score higher on perceived stress scale than patients in remission. It was hypothesized that patients in a flare stage will score lower on self-efficacy. It was hypothesized that patients in a flare stage will have preference to maladaptive coping techniques and male and female patients will have different preferences to coping techniques.

This was investigated using independent sample T-test (see Table 3).

*Table 3: Independent Samples T-test on differences between male and female and stages of Crohn's*

	Male/Female Comparison			Flare/Remission Comparison		
	t (df), p			t (df), p		
Stress	1.480	(94),	0.142	-0.699	(94),	0.486
Self-Efficacy	-0.449	(87),	0.654	0.003	(87),	0.997
Self-Distracton	0.363	(98),	0.717	-1.066	(97),	0.289
Active Coping	1.075	(99),	0.285	-2.004	(96),	0.048
Denial	0.689	(98),	0.493	-1.353	(64),	0.181
Substance Use	-1.916	(58),	0.060	-0.741	(98),	0.460
Use of Emotional Support	0.157	(98),	0.876	-2.683	(83),	0.009
Use of Instrumental Support	-0.598	(98),	0.551	-1.538	(97),	0.127
Behavioural Disengagement	2.062	(99),	0.042	-3.643	(97),	0.000
Venting	-0.137	(98),	0.891	-3.471	(86),	0.001
Positive Reframing	-0.006	(98),	0.995	0.149	(97),	0.882
Planning	0.582	(97),	0.562	-1.639	(90),	0.105
Humour	-0.864	(97),	0.390	-1.520	(96),	0.132
Acceptance	0.153	(97),	0.879	0.320	(96),	0.750
Religion	-0.701	(98),	0.485	0.632	(97),	0.529
Self-blame	0.161	(98),	0.872	-2.107	(70),	0.039

*Hypothesis 1: It is hypothesized that there is a significant difference in mean of perceived stress level scale between patients in flare stage and the ones in remission stage.*

Independent sample T-test was used to check the hypothesis 1. As shown in Tables 1 and 3, the difference mean between stress score for patients in flare (M= 22.8, SD=6.) and remission (M= 22.0, SD=5.5) stages is not significant ( $t(94) = -0.699$ ,  $p=0.486$ ). Therefore the null hypothesis is accepted.

*Hypothesis 2: It is hypothesized that there is a significant difference in mean of self-efficacy scale between patients in flare stage and the ones in remission stage.*

Independent sample T-test was used to check the hypothesis 2. As shown in Tables 1 and 3, the difference mean between self-efficacy for patients in flare (M= 30.2, SD=6.3) and remission (M=30.2, SD=4.8) stages is not significant ( $t(87) = 0.003$ ,  $p=0.997$ ). Therefore the null hypothesis is accepted.

*Hypothesis 3: It is hypothesized that there is a significant difference in mean of maladaptive coping techniques scale between patients in flare stage and the ones in remission stage.*

Independent sample T-test was used to check the hypothesis 3. As shown in Tables1 and 3, the difference between active coping for patients in flare (M= 6.3, SD=1.6) and remission (M= 5.6, SD=2.1) stages is significant ( $t(99) = -2.00$ ,  $p=0.045$ ). Furthermore, the difference between mean values for use of emotional support shows significant ( $t(83) = -2.68$ ,  $p= 0.009$ ) for patients in flare (M= 5.3, SD=1.7) and remission (M= 4.3, SD=1.7). The difference between mean values for behavioural disengagement shows significant ( $t(97) = -3.64$ ,  $p> 0.001$ ) for patients in flare (M= 3.7, SD=1.8) and remission (M= 2.7, SD=1.3). ). The difference between mean values for Venting shows significant ( $t(69) = -3.47$ ,  $p= 0.01$ ) for patients in flare (M= 4.4, SD=1.7) and remission (M= 3.3, SD=1.2). Finally, Self-blame shows significant difference ( $t(70) = -2.11$ ,  $p= 0.04$ ) between patients in flare (M= 4.2, SD=2.0) and remission (M= 3.4, SD=1.5).

*Hypothesis 4: It is hypothesized that there is be a significant difference in mean of maladaptive coping techniques scale between male and female patients.*

Independent sample T-test was used to check the hypothesis 4. As shown in Tables1 and 3, the difference between behavioural disengagement for males (M= 2.7, SD=1.4) and females (M= 3.3, SD=1.7) stages is significant ( $t(99) = 2.06$ ,  $p=0.042$ ). Therefore, the null hypothesis is rejected.

*Hypothesis 5: It is hypothesized that there is a significant relationship between perceived stress scores, self-efficacy and coping techniques.*

The relationship between perceived stress, self-efficacy and coping techniques was investigated using Pearson Correlation Coefficient (See Table 4). The results revealed negative and significant correlation between stress and self-efficacy ( $r = -0.288$ ,  $p < .01$ , 2-tailed) and use of instrumental support ( $r = -0.227$ ,  $p < .05$ , 2-tailed). These results indicate an inverse relationship between the two variables. Furthermore, the results revealed positive and significant correlation between stress and behavioural disengagement ( $r = 0.293$ ,  $p < .01$ , 2-tailed) and Self-blame ( $r = 0.362$ ,  $p < .01$ , 2-tailed), indicating a direct relationship between two variables. Overall results suggest that individuals experiencing high perceived stress levels also reported low self-efficacy. Based on these results the hypothesis is accepted.

*Table 4: Correlation*

	<b>Pearson Correlation to Stress</b>
Self-efficacy	-.288**
Self-Distraction	.024
Active Coping	-.105
Denial	.179
Substance Use	.035
Use of Emotional Support	-.188
Use of Instrumental Support	-.227*
Behavioural Disengagement	.293**
Venting	.138
Positive Reframing	-.109
Planning	-.029
Humour	-.091
Acceptance	-.088
Religion	.007
Self-blame	.362**

\*  $p$  significant at 0.05 level.

\*\*  $p$  significant at 0.01 level.

## **4. Discussion**

The aim of this study was to build on previous research in the areas of perceived stress, coping strategies and self-efficacy and Crohn's disease. The main focus of the current study was to examine the relationship between the disease activity, stress, coping and self-efficacy among male and female individuals. Therefore, the first aim of this study was to explore the relationship between the disease activity and perceived stress levels among people with Crohn's. The second aim was to explore the relationship between self-efficacy, various coping strategies and the disease activity. The third aim of this study was to examine the relationship between perceived stress, selection of coping strategies and self-efficacy. Finally, the fourth aim of this study was to examine how gender differences correlate with the selection of coping strategies. Five hypotheses were formulated, the results of which are discussed below. The results of the current research can be linked back to previous studies and also present some unexpected findings.

### **4.1 Relationship between Crohn's Activity and Perceived Stress Levels**

Results obtained from Independent Sample T-test did not find significance between perceived stress and the disease activity. No significance was found between perceived stress and gender of the participants. These findings are not consistent with the findings of the majority of previous research studies (Mardini et al., 2004; Mittermaier et al., 2004; Levenstein et al., 2000). This can be attributed to the fact that most of the studies are conducted collectively on IBD including both Crohn's and Ulcerative Colitis and lack of research on exclusively Crohn's disease. One of the reasons for non-significant results is that those who reported to be in flare stage could have been diagnosed for several years, have better adjusted to the course of the disease and its symptoms and have developed resilience (Voth & Sirois, 2009). In addition, the sample was recruited through the support web sites

and ISCC group- organisation dedicated to the support of those with IBD. The participants potentially had a better awareness of the illness and the consequences which might be the case in present study. The results indicate that revisiting of interaction between stress and IBD, particularly Crohn's is needed.

#### **4.2 Relationship between Crohn's Activity, Coping, and Self- Efficacy**

The results from the current study found non-significant relationship between flare and remission stages of Crohn's and mean of self-efficacy. As outlined above, it might be related to the participants' adjustment to the illness. To date, self-efficacy in patients with Crohn's disease has only been measured once by Opheim and colleagues (2014). In their study self-efficacy was measured as one of the factors influencing sense of coherence in patients with IBD. Similar to the current study, no significant results were found. Hence more research studies should be conducted specifically on Crohn's sample to further examine the self-efficacy variable as it is essential factor in quality of life and psychological well-being.

This study found significant relationship between active coping strategies and flare stage of Crohn's, with participants who reported to be in a flare stage were more likely to use active coping to deal with the course of the disease. This result contradicts previous findings (Jones et al., 2006; Graff, Walker, Clara, Lix, Miller, Rogala, Rawsthorne, Bernstein, 2009; Casati et al., 2000; Sainsbury et al., 2005) that supported the use of predominantly avoidant coping strategies. There was a significant relationship between the use of emotional support, behavioural disengagement, venting and self-blame in patients with Crohn's in flare which is partially in line with previous findings that suggest maladaptive coping prevalence in patients with IBD. Further results found that females are more likely to use behavioural disengagement to cope with the disease than males.

#### **4.3 Relationship between Perceived Stress, Coping and Self- Efficacy**

The results of Pearson Correlation Coefficient found negative significant correlation between levels of stress, self-efficacy and use of instrumental support confirming the inverse relationship between the variables. Overall results show support to final hypothesis suggesting that those who experience higher perceived stress report lower self-efficacy.

Further investigation showed positive significant correlation between stress, behavioural disengagement and self-blame. This means the participants who scored higher on perceived stress scale are more likely to use maladaptive coping strategies as shown in previous studies by Robertson et al. (1989) and Smith et al. (2002).

#### **4.5 Limitations**

The results of this study should be considered in the light of several limitations. One part of the participants was recruited from the Internet and therefore may not represent Crohn's patients sample in general. The other part was recruited through Irish Society of Crohn's and Ulcerative Colitis and represents only Irish nationals. The fact that individuals recruited online might have potentially be looking for support should be taken into consideration. This can lead to the assumption that the sample consists mainly of people who use adaptive coping strategies as opposed to maladaptive. Moreover, in order to participate in the study, it was necessary to have access to the computer and Internet which might have excluded some sections of the population.

Online data collection can be, however, considered as strength of the study. According to Krantz and Dalal (2000), the online studies are more favourable due to their potential to produce larger and more heterogeneous samples. Hence sample obtain from the Internet allowed this study a larger and somewhat international sample of people diagnosed with Crohn's.

Due to a relatively small sample size (N=102) it is difficult to arrive at a comprehensive result. A larger and more diverse sample could have contributed to a stronger result. The underrepresentation of males (N=38) in the sample might have contributed to the lack of significant results when exploring the differences between males and females and different variables.

Even though self-report is an effective approach for examination of internal processes such as perceived stress and coping, it is limiting in its nature. Hence, the measures used were previously tested and validated.

Inclusion of the control group should be considered for future research together with the mixed study design. Qualitative data derived from interviews can potentially supply researchers with deeper understanding of patients' perspective on the illness and suggest the interventions to be designed.

#### **4.6 Further Research**

Despite the limitations discussed, this study introduced a relatively new variable of self-efficacy in the area of research on Crohn's disease and the psychological well-being of those affected. Another strength of the study is its broad scope; the study examined the relationship between stages of Crohn's disease and three variables not including gender differences. By using the online survey, the study did not put pressure on the participants' free time.

As a consideration for future research, an additional question should be included in the demographic questionnaire specifying the number of years a participant has been diagnosed with Crohn's. Inclusion of control group would be beneficial to control for

stressors not linked directly to the disease. Furthermore, in its current form the study could be extended and replicated with a larger and more diverse sample.

As emphasized by de Ridder and Schreurs (2001), coping variable should be used for further research to assess and address various issues linked with overall adjustment to the disease and development of specific psychosocial interventions to help the patients with Crohn's to use helpful coping strategies. It is recommended that future research looks at the specific relationship between perceived stress and coping strategies and compare them between males and females. The findings of this study illustrate that

#### **4.7 Conclusion**

Despite growing amount of evidence on IBD, the research is still somewhat scarce and inconclusive and lacks understanding of numerous aspects of the disease and its mechanisms. The increasing incidence rates and complexity of the course of Crohn's disease has encouraged the researchers to constantly seek new ways of supporting those affected and develop psychosocial interventions. Stress and its role in IBD remains one of the most researched variables in relation to the onset and course of the disease, even though at times its definitions get confused in the existing literature. Contrary to the previous research, this study did not find significant results between stress levels and disease activity in Crohn's disease patients. In line with Garrett et al's (1991) results, this might be an indication that stress-disease relationship might not be present in all the patients and this relationship needs to be tested in a more controlled environment. Moreover, the need for larger studies is evident. Findings on the role of coping and, in particular, the use of maladaptive coping strategies by individuals with Crohn's disease, mainly women, have provided additional support to the existing literature reporting that the disease activity affects individuals adjustment to the disease and their overall psychological well-being. Further research needed to explore the

gender differences in the Crohn's patients. This study has shown similar results on coping strategies as previous research cited in the introduction of the paper. No significant results found between Crohn's activity and self-efficacy. This can be attributed to a relatively small sample size. Self-efficacy is a fairly new variable in IBD research and needs focus in the future research.

In the view of the results presented in current study, the significance of the psychological factors in the well-being of those affected by the disease is apparent. Therefore the need for the integration of psychosocial interventions alongside with pharmacological treatments is essential.

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*Appendix A***Information Sheet****Study on Crohn's Disease**

Dear Participant,

There is a great focus in research on potential treatment and cure of Crohn's, however, the timeframe for finding a potential cure is ambiguous. The unpredictable and uncertain nature of Crohn's may cause psychological distress, personal concerns, including fatigue, social dependency and mood changes to those affected.

I am conducting this study as part of my thesis for the Higher Diploma in Psychology at Dublin Business School. The purpose of the study is to investigate the relationship between stages of Crohn's disease and its effect on individual's life. Further research will be proposed in support of people with Crohn's disease to address psychological impact of the disease and improve the overall quality of life of those affected.

The research is being conducted by me personally and you do not have to participate if you do not wish to do so. Please be assured that all information provided will be completely confidential and your questionnaire will remain anonymous as your name should not appear anywhere in the questionnaire. I am only interested in analysing and commenting on the aggregate results of the study. I would greatly value your contribution to my research effort.

If you are interested in taking part please answer the questionnaire which will take approximately 7 minutes to finish and if you wish to withdraw you can do that at any

moment. I would like to thank you for taking the time to read this letter. If you would like to know more about my study before deciding whether to participate, please contact me by email

Thanking you for participation.

Sincerely yours

Olesja Darnopiha

*Appendix B***Participant Consent Form**

\*1. Participant Consent - By clicking on the "Yes" box below and proceeding to the rest of the survey, you are indicating that you have read and agree with the following: \*

(1) I have read the study information sheet and have had time to consider whether to take part in this study. I also confirm that I have been given information with the researcher's name and contact details if I require further information.

(2) I agree to take part in this study.

(3) This agreement is of my own free-will.

(4) I have had the opportunity to ask any questions about the study.

(5) All information provided by me will be anonymous and no information that identifies me will be collected.

Yes
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*Appendix C***Demographic Questionnaire****1. What is your gender?**

- Female
- Male

**2. What is your age?**

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 to 74
- 75 or older

**3. What is your nationality?****4. Are you currently in remission?**

- yes
- no

## *Appendix D*

### **The Brief COPE**

*Carver (1997)*

- 1 = I haven't been doing this at all  
 2 = I've been doing this a little bit  
 3 = I've been doing this a medium amount  
 4 = I've been doing this a lot

1. I've been turning to work or other activities to take my mind off things. \_\_\_\_
2. I've been concentrating my efforts on doing something about the situation I'm in. \_\_\_\_
3. I've been saying to myself "this isn't real.". \_\_\_\_
4. I've been using alcohol or other drugs to make myself feel better. \_\_\_\_
5. I've been getting emotional support from others. \_\_\_\_
6. I've been giving up trying to deal with it. \_\_\_\_
7. I've been taking action to try to make the situation better. \_\_\_\_
8. I've been refusing to believe that it has happened. \_\_\_\_
9. I've been saying things to let my unpleasant feelings escape. \_\_\_\_
10. I've been getting help and advice from other people. \_\_\_\_
11. I've been using alcohol or other drugs to help me get through it. \_\_\_\_
12. I've been trying to see it in a different light, to make it seem more positive. \_\_\_\_
13. I've been criticizing myself. \_\_\_\_
14. I've been trying to come up with a strategy about what to do. \_\_\_\_
15. I've been getting comfort and understanding from someone. \_\_\_\_
16. I've been giving up the attempt to cope. \_\_\_\_
17. I've been looking for something good in what is happening. \_\_\_\_
18. I've been making jokes about it. \_\_\_\_
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping. \_\_\_\_
20. I've been accepting the reality of the fact that it has happened. \_\_\_\_
21. I've been expressing my negative feelings. \_\_\_\_
22. I've been trying to find comfort in my religion or spiritual beliefs. \_\_\_\_
23. I've been trying to get advice or help from other people about what to do. \_\_\_\_
24. I've been learning to live with it. \_\_\_\_
25. I've been thinking hard about what steps to take. \_\_\_\_
26. I've been blaming myself for things that happened. \_\_\_\_
27. I've been praying or meditating. \_\_\_\_
28. I've been making fun of the situation. \_\_\_\_

## *Appendix E*

### **Perceived Stress Scale**

*Cohen, Kamarck and Mermelstein (1983)*

**0 = never 1 = almost never 2 = sometimes 3 = fairly often 4 = very often**

<b>1</b>	1. In the last month, how often have you been upset because of something that happened unexpectedly?	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>2</b>	In the last month, how often have you felt that you were unable to control the important things in your life?	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>3</b>	In the last month, how often have you felt nervous and stressed?	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>4</b>	In the last month, how often have you felt confident about your ability to handle your personal problems?	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>5</b>	In the last month, how often have you felt that things were going your way?	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>6</b>	In the last month, how often have you found that you could not cope with all the things you had to do?	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>7</b>	In the last month, how often have you been able to control irritations in your life?	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>8</b>	In the last month, how often have you felt that you were on top of things?	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>9</b>	In the last month, how often have you been angered because of things that happened that were outside of your control?	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>

<b>10</b>	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
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*Appendix F*

**Generalized Self-Efficacy Scale**

Schwarzer & Jerusalem (1995)

**1 = Not at all true   2 = Hardly true   3 = Moderately true   4 = Exactly true**

<b>1</b>	I can always manage to solve difficult problems if I try hard enough.	
<b>2</b>	If someone opposes me, I can find the means and ways to get what I want.	
<b>3</b>	It is easy for me to stick to my aims and accomplish my goals.	
<b>4</b>	I am confident that I could deal efficiently with unexpected events.	
<b>5</b>	Thanks to my resourcefulness, I know how to handle unforeseen situations.	
<b>6</b>	I can solve most problems if I invest the necessary effort.	
<b>7</b>	I can remain calm when facing difficulties because I can rely on my coping abilities.	
<b>8</b>	When I am confronted with a problem, I can usually find several solutions.	
<b>9</b>	If I am in trouble, I can usually think of a solution.	
<b>10</b>	I can usually handle whatever comes my way.	

*Appendix G*  
**Support Services**

Should you need emotional support please contact Crohn's and Colitis Support on 0845

130 3344 or 0121 737 9931