Psychological Predictors of Wellbeing:

A comparison of IBD and non-IBD respondents

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Declaration

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university or other institution.

To the best of my knowledge this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Bianca C. Holzer

Ethics Approval

The research for this thesis received the approval of the Monash University Standing Committee on Ethics in Research involving Humans.

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Acknowledgements and personal comments

To my father, Peter, mother, Julie, husband, Tim and to our son, Maxwell – who has stoically experienced chronic illness throughout his life – I dedicate this thesis and express my heartfelt thanks and gratitude for their unfailing support and encouragement.

To my supervisor, A/Professor Geof Molloy – who has also experienced his fair share of illness – I thank you for your long-term encouragement and sustained commitment to this thesis write-up and for your continued words of advice and guidance. A thanks also goes to Dr Kate Jacobs who has assisted me with the final leg of this PhD marathon. Your contribution and suggestions have been highly valued.

At the age of 19 I was diagnosed with Crohn's Disease (CD). That event marks the beginning of an abiding interest in how individuals cope with chronic illness in general, and Inflammatory Bowel Disease (IBD) in particular. From approval to conduct this dissertation by Monash Standing Committee for the Ethical Conduct of Post-graduate Research to its completion and submission for examination has taken the best part of 12 years. I'm proud, both for myself, my family and my supervisor, to have finally finished the job.

Most of this report is written in the traditional third person mode, but at times, where appropriate, I have used the less formal first person – particularly in relation to comments from interview information.

Bianca C. Holzer

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List of Abbreviations

BDI	=	Beck Depression Inventory
CD	=	Crohn's Disease
CECS	=	Courtauld Emotional Control Scale
CSA	=	Coping Scale for Adults
DSSI	=	Duke's Social Support Index
E	=	Extraversion
EPI	=	Eysenck Personality Inventory
GHQ	=	General Health Questionnaire
GSES	=	Generalised Self-Efficacy Scale
HRQOL	=	Health Related Quality of Life
IBD	=	Inflammatory Bowel Disease
MHLOC	=	Multidimensional Health Locus of Control
N	=	Neuroticism
NA	=	Negative Affect
PA	=	Positive Affect
PANAS	=	Positive Affect and Negative Affect Scale
PCOISS	=	Perceived Control of Internal States Scale
PSS	=	Perceived Stress Scale
RSES	=	Rosenberg Self Esteem Scale
SOFA	=	Scale of Family Atmoshphere
UC	=	Ulcerative Colitis

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Abstract

Coping with stress in relation to chronic illness remains a central issue in health psychology. Ulcerative colitis (UC) and Crohn's disease (CD) are two forms of chronic intestinal malfunction known collectively as inflammatory bowel disease (IBD). Recent estimates indicate that more than 80,000 individuals are affected by IBD in Australia and 1,500,000 in North America. Its prevalence is increasing, particularly in industrialized nations and the disease appears to affect females and males equally. Since Lazarus' pioneering work on coping strategies, psychologists have been interested in how people adapt to chronic health issues, and in turn, how their coping efforts affect psychological wellbeing. Many recent reports have suggested that personal characteristics including personality dispositions and coping strategies affect adjustment to illness in general and IBD in particular. The majority of studies reviewed by the researcher are nonetheless of questionable design, lack a theoretical framework, and fail to incorporate matched comparison groups. The present dissertation is unique in several ways. Specifically, predictions for the current study were based on a logically deduced theoretical framework and included a pool of common, psychometrically validated measures of *both* positively and negatively worded questionnaires. All major hypotheses generated from the model were systematically tested using groups balanced for IBD type, severity of illness, age, sex and, importantly, a comparison group. ***Objective:*** To construct a cohesive framework which investigates how individuals deal with stress, what personality and coping measures influence their wellbeing and whether these factors differ between individuals with or without chronic illness, specifically IBD. It was predicted that IBD volunteers, compared to non-IBD volunteers would exhibit lower scores on the measures of wellbeing. Personality and coping-control mechanisms were also expected to differ between the comparison groups. It was predicted that personal dispositions would provide a stronger influence on wellbeing, compared to the more transitory coping-control measures. Coping-control mechanisms were also assessed as to whether they would significantly contribute to wellbeing, over and above the personality domains. ***Method:*** This cross-sectional investigation systematically compared the responses of a

group of IBD outpatients (*n*=95) to a matched non-IBD group (*n*=87) on a battery of self-report questionnaires tapping measures of personality, coping and wellbeing. Participants were assigned to one of eight groups according to whether they were representative of the following comparison subgroups: illness (IBD vs. non-IBD), type of illness (UC vs. CD), severity of illness (severe vs. mild) and sex (female vs. male). ***Results:*** As predicted, IBD participants, compared to non-IBD participants, scored significantly lower on all wellbeing measures; that is, increased general health complaints, perceived stress and depression. The comparison groups were indistinguishable on the majority of measures pertaining to personality and coping-control mechanisms. Regression analyses identified that negative affect (NA) was the strongest personality predictor; and perceived control of internal states (PCOIS) was the best coping-control predictor of wellbeing. As expected, personal dispositions were stronger predictors of wellbeing than the group of coping-control mechanisms. Hierarchical multiple regression analyses illustrated that coping-control mechanisms only negligibly added to the prediction of wellbeing beyond that accounted for by the personal disposition measures. ***Conclusion:*** Results failed to provide evidence of an IBD-prone personality as the measures of personal dispositions and coping-control mechanisms were *essentially* the same for the IBD and non-IBD comparison groups. Although the IBD group, compared to the non-IBD group, scored significantly lower on the selected wellbeing measures, it is emphasized that neither group scored low enough to warrant classification within the clinical range. It was demonstrated that coping-control mechanisms play an important role in influencing wellbeing, but the innate and stable nature of personality dispositions override these more transient influences. The thesis concludes with the argument that between-group designs are not very helpful in identifying differences in predicting psychological wellbeing between the "well" and the "sick". This method evaluates group trends, but in doing so failed to identify individual differences. It is suggested that idiographic or *n*=1 studies, in combination with between-group designs, would prove a more fruitful method of understanding relations between chronic illness and wellbeing.

Chapter 1: Introduction and Overview

1.1 Chapter Overview

This chapter describes the rationale for conducting the study. It begins with a description of a conceptual framework constructed for the current dissertation and from which specific predictions were derived (see Chapter 2). The model represents a departure from earlier reports presenting either "armchair" frameworks devoid of empirical support or empirical studies devoid of theoretical underpinnings and comparison groups.

1.2 Introduction

Coping with chronic stress is a central issue in both general psychology and in particular, health psychology. Since Lazarus' (1984, 1994, 2006) pioneering work in the field of stress and coping, much psychological research and conjecture has focused on how individuals adapt to adverse circumstances and major life stressors; such as work, finance, relationships, bereavement and illness. In particular, health psychologists have been interested in how individuals cope with chronic illness, and in turn, how coping strategies affect wellbeing. Initially, Lazarus conceptualised stress as a consequence of an imbalance between demands and resources; when pressures exceed our *perceived* ability to cope – a position modified in 2006 and discussed later in this report. It is assumed that psychological adjustment is determined by our ability to modify responses to actual or perceived stressors. Thus, to develop an effective stress management

program, it is first necessary to identify thoughts and actions that are central to personal stress control and to identify effective coping strategies. This interaction between events and our interpretation of them has been referred to as the "transactional model" of wellbeing with implications for "psychological intervention". It has been argued from both philosophical and psychological perspectives that we are distressed or disturbed not by events *per se* but by our interpretation of them (Ellis, 1995) or in Elizabethan times, "…there is nothing either good or bad, but thinking makes it so" (Hamlet, Act 2, scene 2, p.239–251).

It is generally assumed that individuals with chronic illness, such as IBD, are at a greater risk of increased stress and poorer adjustment than individuals without chronic illness (Engstrom 1991a; Engstrom, 1991b; Kovacs & Kovacs, 2007; Mackner & Crandall, 2006; Sheffield & Carney, 1976). Some research has illustrated however, that the degree of stress and adjustment varies considerably within illness groups, indicating that factors other than the condition itself are responsible (Grey & Thurber, 1991; Grey et al., 1997; Pollock, 1986). Recent research implicates intrapersonal factors (personality dispositions and coping – control strategies) and interpersonal factors (social support) as contributors of illness adjustment.

Although abundant research exists in relation to intrapersonal dispositions (personality/coping strategies), interpersonal factors (social support), wellbeing and adjustment to other chronic illnesses, no study has simultaneously and systematically investigated such measures with regard to IBD and included a matched comparison group. IBD is a chronic disease involving inflammation of all or part of the digestive tract.

One of the key purposes of any psychological research is to inform readers how information from the data analyses can be applied to everyday situations. With health research involving chronic illness, its fundamental aim is to provide individuals with strategies and treatment options that may facilitate actual and perceived improvements of physical and psychological wellbeing. Logically, before attempting to design such management plans, it is necessary to determine the processes (coping mechanisms) that may contribute to the outcome variables; in the present context, measures of wellbeing.

However, much of extant literature addressing long-term stress and chronic illness, and their relationships with personality, coping and wellbeing/adjustment (see Chapter 2 for literature review) lacks a theoretical basis and is devoid of a cohesive conceptual framework. Research in this area has also been poorly designed, often devoid of a disease-free (matched) group and resulting in unfounded conjecture. Consequently, inappropriate inferences have been made to the health compromised population. As a result, there is a clear need for studies which are methodologically justifiable.

Folkman (2009) noted, that of the six theory-based articles she reviewed on stress and coping, although they may adequately translate their theory into research, they largely fail to translate their findings into meaningful practice (i.e., applying their data to everyday situations). She further highlighted the importance of theoretical models being able to provide useful and testable predictions.

1.2.1 Background rationale for conducting the current research.

My interest in relations between chronic illness and adjustment began in the mid 1990s when I was first diagnosed with Crohn's disease (CD). Of particular interest to me were observations that lead me to question why people adjust differently to long-term illness. Although there is a considerable body of knowledge on coping with prolonged illness in general, there have been relatively few well-designed studies pertaining specifically to inflammatory bowel diseases. These assertions will be discussed in more detail in Chapter 2: Literature Review.

The aim of this investigation is to identify intra- and interpersonal characteristics that may assist or contribute to wellbeing and illness adjustment. The current research explored personality, coping - control and wellbeing differences between matched comparison groups (IBD participants and non-IBD participants). It used an appropriate experimental design and a logically derived conceptual framework (to be outlined in detail in Chapter 3) to address these issues.

1.3 Conceptual Framework

To reiterate, most research in the area of personality, coping and adjustment does not provide a guiding conceptual framework. An important component of the current research is the development of a conceptual framework of "Adjustment to Chronic Illness" (see Figure 1.1). This framework demonstrates the basic structure and interrelations of the variables selected for use in this study. The Framework is explained

in greater detail in the methods chapter. For the present section each component of the framework is briefly discussed.

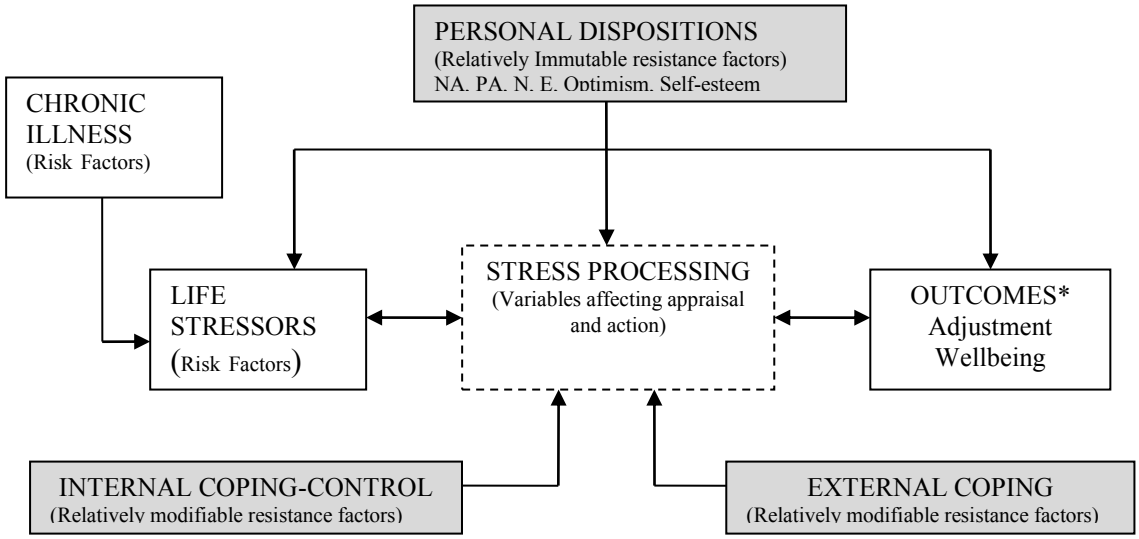


Figure.1.1 Conceptual Framework of Adjustment to Chronic Illness.

Adapted from: Lazarus and Folkman (1984), Molloy (1984, 2007), Lazarus (2006) and Folkman (2010).

*Outcomes refer to self-report rather than physiological measures.
Shaded boxes represent resistance factors

Life Stressors are activities, events, or other stimuli that cause stress. Examples include daily hassles, employment, relationship breakdowns, death or illness. The framework assumes that life stressors are similar for all people within a given culture. Furthermore, chronic illness represents a unique set of "stressors".

Stress processing represents the means by which an individual copes with stress. It incorporates thoughts and behaviours that moderate experiences and events that can be challenging or stressful. As described in Shakespeare's Hamlet: "…there is nothing

either good or bad, but thinking makes it so" (Hamlet, Act 2, scene 2, p. 239–251). Also, as Albert Ellis claimed "We are disturbed not by events per se, but by our interpretation of them". In other words, how we interpret external or internal (i.e., imagined) events determines whether or not we perceive them as "stressful"- either positively or negatively - despite the fact that we tend to associate negative events with "stress". For example, according to Lazarus (2006), "…stress is a natural and expectable feature of living, but it also makes the coping process necessary. If coping is ineffective, stress is apt to be substantial and may have damaging consequences for health, *morale*, and social functioning. If coping is effective, stress is likely to remain under control" (p. 20).

Outcomes represent an individual's level of wellbeing and adjustment and are represented by self-report rather than physiological measures.

The framework of "Adjustment to Chronic Illness" posits that both positive and negative life stressors have the *potential* to influence outcomes (reported wellbeing and in some cases physiological states). The extent to which an individual deals with these stressors (Lazarus, 2006) is related not only on the stressors experienced, but also on *how* these stressors are processed. In the framework (Fig. 1.1) there are three components which directly influence "stress processing": (1) **personality dispositions** (i.e., relatively stable human characteristics such as optimism, self –esteem, neuroticism, extraversion and trait affect); (2) **internal coping mechanisms – control orientations** (i.e., generalized beliefs and expectations regarding one's abilities and internal resources) and (3) **external coping facilitators** like social support and

employment status. Components 2 and 3 are theoretically more amenable to change. Each of these stress processing influences is considered in the following section.

1.4 Definition of key terms

1.4.1 Inflammatory Bowel Disease (IBD).

Inflammatory Bowel Disease (IBD) is a term used to describe two diseases, ulcerative colitis and Crohn's disease, which both cause inflammation of the bowel. Although the two diseases represent distinct conditions they are usually considered collectively as they share many symptoms, have a similar clinical course and are both of unknown aetiology (Searle & Bennett, 2001). Crohn's Disease (CD) causes inflammation of the full thickness of the bowel wall and may involve any part of the digestive tract from the mouth to the anus. Ulcerative Colitis (UC) causes inflammation of only the inner lining of the large bowel (i.e., colon and rectum).

1.4.2 Wellbeing - "Outcome" component of the framework.

Constructs such as "wellbeing", "psychological adjustment" and "quality of life" (QOL) are outcomes of great interest in the health psychology literature. In general, these terms relate to a contented state of being happy, healthy and financially secure. Literature demonstrates that key measures of an individual's wellbeing include positive experiences such as happiness, confidence, good physical health, and a positive attitude. Health related QOL (HRQOL) is frequently defined as the physical, psychological and

social domains of health that are influenced by a person's experiences, beliefs, expectations and perceptions (Testa & Simonson, 1996). A limitation of past research in this area is the use of inadequate and a limited number of wellbeing measures. There is a danger, for example, of assuming that chronic illness will negatively influence wellbeing, when wellbeing is only defined by a single measure (e.g., GHQ). It is for this reason the present research includes a battery of wellbeing measures including: symptoms of depression (BDI), general health (GHQ), perceived stress (PSS) and a specific measure of IBD Adjustment.

1.4.3 Personality Dispositions.

Personality is a collection of emotional, thought and behavioral patterns that is unique to an individual and consistent over time. According to Eysenck (1970, p. 2), personality is "a more or less stable and enduring organization of a person's character, temperament, intellect and physique which determines his unique adjustment to the environment". Carver and Scheier (2000) describe personality as a dynamic organization of psychophysical systems within an individual that determines their characteristic patterns of behaviour, thoughts, and feelings.

For the purpose of this research - in line with most previous studies - personality is tapped by measures including Extraversion and Neuroticism (EPI, Eysenck & Eysenck, 1964); negative and positive affective states (PANAS, Watson, Clark, & Telligen, 1988; Molloy, Pallant, & Kantas, 2001); optimism (LOT-R, Scheier, Carver, & Bridges, 1994) and self-esteem (RSE, Rosenberg, 1965).

1.4.4 Internal coping mechanisms.

Coping is viewed as "constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of a person" (Lazarus & Folkman, 1984, p. 141). Coping has also been referred to as "the active efforts of mastering, reducing or tolerating the demands created by stress" (Coon, 1992). When stressed, individuals are seen to employ coping responses as a way of making situations more manageable, or to reduce the negative effects of the situation. In general, coping efforts have been conceptualized as a dichotomy: "problem focused coping" which include strategies aimed at the perceived external source of stress and "emotion focused coping" which include strategies aimed at regulating emotional states as a way of adapting to a stressful event (Lazarus & Folkman, 1984).

Coping strategies cannot be judged as being universally good or bad, as individuals are seen to use different coping efforts depending on the situation. Frydenberg and Lewis (1997) have therefore characterized coping styles as being generally productive or nonproductive. They defined coping as

"….a set of cognitive and affective actions which arise in response to a particular concern. They represent an attempt to restore the equilibrium or to remove the turbulence for the individual. This may be done by solving the problem (i.e., removing the stimulus) or accommodating to the concern without bringing about a solution" (Frydenberg & Lewis, 1993, p.255)

For the purpose of this research, coping is defined by the use of two general coping styles from the Coping Scale for Adults (CSA) (Frydenberg & Lewis, 1997): *dealing with the problem* (a productive coping style) and *nonproductive* coping.

1.4.5 Control Orientations.

In general, individuals experience the greatest amount of stress when they feel they are dealing with situations in which they have little or no control (Cooper & Payne, 1991). Much research has acknowledged that a lack of control significantly and negatively impacts on an individual's psychological and physical health (Pallant, 2000). When an individual believes to have control over stressful events however, they are more likely to find exposure to it far less upsetting. Furthermore, the literature shows that *actual* control does not appear to be crucial; it is the *perception* that such control exists which is sufficient. A sense of perceived personal control over stressful events is what strongly influences an individual's reaction to such events (Scheier & Carver, 1985). When individuals perceive to be in control, they are more likely to overcome the helplessness that accompanies coping with a chronic illness, such as IBD (Klonowski & Masoodi, 1999; McCloud, 2000).

The current research includes both internal and external control measures to explore the domain of control and its effects on wellbeing and illness adjustment. These measures include: the Multidimensional Health Locus of Control Scale (MHLC – Wallston, Wallston, & DeVellis, 1978), the perceived control of internal states scale (PCOISS -

Pallant, 2000), the generalized self-efficacy scale (GSES - Schwarzer & Jerusalem, 1993) and the Courtauld Emotional Control Scale (CECS - Watson & Greer, 1983).

1.4.6 External coping facilitators.

Social support is referred to as an interpersonal interaction including affection, assurance and help (Engstrom, 1991b). Health literature has documented that support is extremely beneficial, particularly in highly stressful situations. Family relationships are posited to play an important role in relation to wellbeing and adjustment to chronic illness. Individuals who obtain support and have close, friendly ties with other people are thought to be better able to cope with and reduce the negative effects of stress and illness (Sarason, Sarason, & Pierce, 1990; Sewitch et al., 2001; and Thoits, 1995). The present study used two measures to investigate external coping facilitators – Duke's social support scale (Koenig, Westlund, George, & Hybels, 1993) and the Scale of Family Atmosphere (SOFA - Molloy & Pallant, 2002).

1.5 Overview of the thesis

In line with the format promulgated by the American Psychological Association (APA, 2001) this cross-sectional between group study comprises five Chapters. The present chapter (Chapter 1) introduces the topic, the rationale for conducting the study and discussion and clarification of key terms. Chapter 2 reviews recent literature on inflammatory bowel disease (IBD) from 1970 to 2012. It discusses the condition,

posited aetiologies, symptoms and treatment. This review also includes a discussion of the psychological aspects (i.e., stress, personality and coping-control) of adjustment. From the studies reviewed, selected reports that are most relevant to the present study are discussed in more detail. The chapter concludes with a synopsis of testable hypotheses and predictions based on this review. Chapter 3 outlines the method and procedures from ethical approval to participant recruitment. It explains the design of the study including a revised theoretical framework, and describes the measures in relation to the framework (i.e., personal dispositions, internal coping-control, external coping and outcome/adjustment). A description of the statistical analyses used to test the major hypotheses is presented at the conclusion of this chapter. Chapter 4 reports the results of the statistical analyses. It begins with describing participant characteristics followed by analyses of mean differences, correlation matrices and multiple regression tables. Finally, Chapter 5 reviews the results of the statistical analyses and discusses these findings along with their implications for the wider population. The chapter concludes with a discussion of some contributions and limitations of the study and proposals for future research directions.

Chapter 2: Literature Review

2.1 Chapter Overview

This chapter reviews recent literature pertaining to coping with chronic medical issues, in particular, inflammatory bowel disease (IBD). It discusses the condition, possible aetiology, symptoms, treatment and psychological correlates. A search of the on-line bibliographic databases MEDLINE and PsycINFO was conducted to identify potentially relevant English language articles published between 1970 and 2010. The subject headings, "Inflammatory Bowel Disease", "Crohn's Disease", "Ulcerative Colitis", "Personality" "Coping", "Psychological Adjustment" and "Wellbeing" were used to perform keyword searches of the databases. Further, manual searches of the reference lists from the potentially relevant papers were performed to identify additional studies that may have been missed using the computer-assisted search strategy. A total of 64 studies relating to the search words were identified (see Table 2.1). From these studies, selected reports that were most relevant to the present study are discussed in more detail. Note that some of the articles selected for more detailed review are not specifically related to IBD – see Section 2.1 Inflammatory Bowel Disease. Examples of articles included in the summary which relate to chronic disease more generally are those authored by Felton and Revenson (1984), Grey, Lipman, Cameron and Thurber (1997) and McLean, Harvey, Pallant, Bartlett and Mutimer (2004). These articles are included because of their overlap with the current study including common measures, developed at the *Monash Centre for Counselling and Human Development,* and design comparisons. Recent papers by McLean et al. (2004), Moreno-Jiminez, Blanco,

Rodriguez-Munoz and Hernandez (2007) are most closely related to the present survey. Although the cross-sectional studies by McLean et al. (2004) and Moreno-Jiminez et al. (2007) used several measures common to the present study they were largely atheoretical (since these studies did not make reference to a specific framework when designing their projects and selecting variables for investigation), limited in its use of predictor variables, incorporated only one measure of wellbeing and did not include a comparison group. The chapter concludes with a synopsis of testable predictions based on this review.

2.2 Inflammatory Bowel Disease (IBD)

Inflammatory Bowel Disease (IBD) is a term referring to two related diseases of the gastrointestinal tract, Crohn's disease (CD) and ulcerative colitis (UC). Although the two diseases represent distinct conditions they are usually considered together as they share many symptoms, have a similar clinical course and are of unknown aetiology despite years of study (Searle & Bennett, 2001). IBD is also often difficult to diagnose as it is often confused with conditions such as irritable bowel syndrome (IBS), due to the similarity of symptoms (Klonowski & Masoodi, 1999). People afflicted by this disease face long-term adjustment challenges with respect to the course of their condition, treatment regimens, changes in functional ability and psychosocial consequences including: quality of life and psychological wellbeing (Hommel, 2008).

While IBD afflicts individuals of all ages, it is primarily a disease of the young, as most cases are diagnosed between the ages of 15 to 30 (Klonowski & Masoodi, 1999; Lukash

& Johnson, 1975). IBD is equally represented in males and females (Hommel, 2008; Lindberg, Lindquist, Holmquist, & Hildebrand, 2000). Overall, caucasians constitute the vast majority of the IBD population; individuals of Jewish decent and individuals of higher SES are also more highly represented within the IBD population (Shabsin & Whitehead, 1991; Van Dongon, 1985). The incidence and prevalence of IBD is stabilizing in high-incidence areas such as northern Europe and North America, and it continues to climb in low-incidence areas such as southern Europe, Asia, and much of the developing world (Loftus, 2004). In 2007 it was estimated that approximately 61,000 Australians had IBD; 28,000 being diagnosed with CD and 33,000 with UC (ACCA, 2007). A more recent Australian estimate shows an increasing incidence of IBD, bringing the total to around 80,000 (Molodecky et al., 2012).

Conflicting results have been reported in the area of psychological differences between individuals with CD and UC. McKegney, Gordon and Levine (1970) noted from their IBD sample *(n*=123) that although UC participants came from less cohesive families compared to CD participants, neither groups differed significantly on the personality measures of the Cornell Medical Index (CMI). Helzer, Chammas, Norland, Stillings and Alpers (1984) also reported that their IBD groups did not differ on measures of neuroticism. However, Schwarz (1989) reported that CD participants scored significantly higher on measures of anxiety and distress, and exhibited greater symptom severity compared to UC participants. Furthermore, Casellas, Lopez-Vivancos, Badia, Vilaseca, and Malagelada (2000) noted that active CD impairs quality of life significantly more than active UC.

2.2.1 Symptoms, Causes and Treatment of IBD.

Symptoms. The course of IBD is most often marked by relapses and recoveries (Rubino et al., 1999). The symptoms of these conditions will also vary depending on the severity and the location of the inflammation. The most common symptoms are abdominal pain, diarrhoea, rectal bleeding, anemia, fever, malnutrition and weight loss (Gasche et al., 1997; Hommel, 2008). To date, there is no way to predict when a remission may occur or when the symptoms will return (Casellas et al., 2000). Despite a great deal of research, the cause of IBD is unknown. There are many theories about what causes IBD, but none of them have been firmly established (Thompson, Driscoll, Pounder, & Wakefield, 1996).

Causes. The following assertions were previously postulated theories regarding the causes of IBD. One early theory proposed by Alexander (1950) suggested that many illnesses including UC were not the result of disordered cellular functioning, but rather a symptom of emotional disorder. He claimed that UC arose from unresolved conflicts. As the Autonomic Nervous System (ANS) could not cope with the anxiety produced by these unconscious conflicts, a pathological toll arose. Engel (1958) suggested that an inherent biological predisposition to developing GI disease was activated by a psychological threat to an intense dependency between the patient and their mother. A disruption of this symbiotic tie lead to rage and grief that was imploded inward affecting the digestive system (Gerson, Grega, & Nathan–Virga, 1993).

The "hygiene hypothesis" has been suggested to contribute to the development of autoimmune conditions, such as IBD. This hypothesis states that the lack of childhood exposure to infectious agents, symbiotic microorganisms and parasites can increase the susceptibility of certain diseases by affecting immune system development (see Strachan, 1989, for more information on the hygiene hypothesis).

Others believe that hereditary factors and genetics play a role in the cause of IBD (Grandbastien et al., 1998; Lee, Bridger, McGregor, Macpherson, & Lennard, 1999; Polito et al., 1996; Thompson et al., 1996). These studies indicated that 15% - 30% of individuals with IBD have a relative with the disease. Recent research has found there to be a link between Crohn's disease and a region on Chromosome 12 (Hugot et al., 1996; Parkes, Satsangi, Lathrop, Bell, & Jewell, 1996). Although research continues to establish which genes govern its transmission, or predispose an individual to acquire the disease, it is known that affected offspring have a significantly earlier onset and greater extent of disease, than their affected parent (Lee et al., 1999). It has also been reported that females, compared to males, have a greater frequency and severity of IBD symptoms (Duffy et al., 1991a).

Morris, Montgomery, Galloway, Pounder and Wakefield (2001) observed that left handedness is significantly associated with IBD, bowel disorders in general and other auto immune diseases. With the use of a questionnaire, Morris and colleagues found that although more males than females were left-handed, gender was not linked to IBD. More interestingly, they established that the rates of both CD and UC were twice as high in left-handers compared to right-handers. The association between left handedness and IBD is important, as it suggests that they may share common aetiological

influences, or may indicate a marker of susceptibility. This link could reflect shared genetic traits, environmental factors acting in early life, or a combination of these. Geschwind and Behan (1984) suggest that the influences of testosterone, either an excess production or an increased sensitivity to it, may alter the growth of the left cerebral hemisphere and the thymus simultaneously. This may then result in an association between left handedness and certain T-cell dependent immune disorders.

Shields and Low-Beer (1996) provided 102 CD outpatients with a short questionnaire in relation to smoking status. The results identified that smoking increases the risk of clinical, surgical and endoscopic recurrence of IBD. Over a 10 year span the rate of recurrence was 70% for smokers and only 41% for non-smokers. Passive smoking has also been reported as a risk factor for recurrence and increased severity of IBD in children (Duffy et al., 1990).

A substantial amount of health literature posits that certain personality types contribute to the development of IBD. For example, Robertson, Ray, Diamond and Edwards (1989) surveyed a sample of IBD and non-IBD participants with the EPI *(n*=120). Both new referrals and established cases took part in the study. The results reported significantly higher neuroticism and introversion scores for both new referrals and established IBD participants, compared to non-IBD participants. Robertson et al. (1989) claimed that as EPI scores reflect longstanding stable personality traits – rather than phenomena associated with recent life events - and as these personality traits were observed before an official IBD diagnosis was given (in the case of data from the new referrals), they concluded that personality characteristics were a component of premorbid personality.

Although the exact cause of IBD remains a mystery, sources suggest that a single cause of IBD seems improbable; preferring instead a multifactorial cause (McClung, 1994). It is expected that many causative factors come together in a few susceptible individuals to produce the disease. Such factors include genetic susceptibility, psychogenic, dietary, infectious, and autoimmune (Casellas et al., 2000; Duffy et al., 1992; Loftus, 2004; McClung 1994; Petronis & Kennedy, 1995; Thompson, 1993). Some individuals may inherit a tendency to develop IBD, which becomes manifest when triggered by something in the environment: a microorganism, immune response to an intestinal antigen or a behavioural responses to stress (Peters, 1998). Although several factors may have an effect on the course of IBD, the attitude towards these factors are shaped by the availability and adequacy of information, the doctor-patient relationship, and illness acceptance (Hommel, 2008).

Treatment. Currently no medical cure exists for IBD. Effective medical treatment however, can suppress or control the abnormal inflammatory process, permit healing of the diseased intestine, rectify nutritional deficiencies, and relieve the symptoms of diarrhoea, abdominal pain and rectal bleeding (Hommel, 2008; Klonowski & Masoodi, 1999; Scala, 1990).

The treatment of choice for individuals with IBD depends on the location and severity of the disease, complications, and responses to previous treatment (Casellas et al., 2000; Hommel, 2008). Abdominal cramps, inflammation and diarrhoea may be helped by certain medications such as sulfasalazine or mesalazine, while more serious cases may require steroids (e.g., cortisone/prednisolone), antibiotics, or drugs that affect the

immune system (e.g., azathioprine) (Casellas et al., 2000). Infliximab may be prescribed in severe cases of IBD where other treatment options have been unresponsive (Hommel, 2008). Individuals suffering from severe symptoms are admitted to hospital in order to correct malnutrition and to cease diarrhoea and the consequent loss of blood (Scala, 1990).

Most individuals with IBD respond well to medications and nutritional planning. In a small proportion of patients, medical therapy proves unsuccessful and complications such as blockage, perforation, abscess or bleeding in the intestine may arise (Casellas et al., 2000). Under these circumstances surgery is considered, whereby removal of either the damaged piece of intestine or the entire colon and rectum is carried out. Up to 75% of individuals with CD and up to 40% of those with UC will require surgery at some stage during the course of their illness (Langholtz, Munkholm, Krasilnikoff, & Binder, 1997). Removal of the diseased colon can be a "cure" for UC. In CD however, this surgery is not a cure, as inflammation tends to reoccur next to the area of removed intestine. Surgery for individuals with CD only aims to temporarily relieve symptoms not responsive to medical therapy (Thirlby, Land, Fenster, & Lonborg, 1998).

Although people with CD are aware of the possible recurrence of inflammation, and that surgery does not "cure" them from the disease, research has shown marked improvement in the quality of life, psychological and social functioning of CD individuals after surgical treatment (Casellas et al., 2000; Meyers, Walfish, & Sacher, 1980; Olbrisch & Ziegler, 1982b; Thirlby et al., 1998). Thirlby et al. (1998) also identified that although surgery and the prospect of requiring an ostomy bag, is the greatest concern for IBD participants, the health-related quality of life (HRQOL) of IBD

participants improved significantly after surgery; nearly reaching that of the general population. In spite of this finding, Casellas et al. (2000) argued that it was not the surgery that improved HRQOL, rather the improvement of their disease symptoms. Casellas and colleagues also identified that although active CD impairs a patient's HRQOL, significantly more than active UC, HRQOL improves in both conditions during remission, whether achieved medically or surgically.

A number of writers claim that the consequence of chronic illness involves not only exacerbations of the illness, but also problems with psychosocial maladjustment (Baum, Herberman, & Cohen, 1995; Grey, Lipman, Cameron, & Thurber, 1997; Mackner, Crandall, & Szigethy, 2006; Todarello, Porcelli, Bellomo, & Nardini, 2004). Engstrom (1991a) noted that IBD participants, compared to matched healthy controls, displayed significantly higher rates of behaviour and psychological problems - the most common being depression and anxiety. The presence of chronic illness alone is not sufficient to produce this maladjustment; yet it can place the individual at risk of increased vulnerability to the stressors of daily life (Grey et al., 1997). As a result, psychological treatments have been suggested as an effective adjunct to medical treatment (Shabsin & Whitehead, 1991). Kessler and von Wietersheim (2005) believe that although psychotherapy does not influence IBD itself, it does nurture the psychological state of the participants. Multi-component cognitive and behavioural interventions have benefited IBD volunteers by reducing their symptoms (Baum, 1982; Bruning, 1991; Shaw & Ehrlich, 1987; Vega & Rodriguez, 2004) and improving their coping indices, symptoms of depression, IBD-specific stress and physical functioning (Milne, Joachim, & Niedhardt, 1986; Mussell, Bocker, Nagel, Olbrich, & Singer, 2003; Schwarz, 1989; Szigethy, 2005).

Table 2.1 A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
McKegney, Gordon and Levine (1970) *Psychosomatic Medicine*	123 IBD	N/R*	N/R*	Outpatients	Cornell Medical Index (CMI)	Uncontrolled 2-phase study	UC and CD moderately – severely emotionally disturbed (CMI). Both UC and CD similar on personality, demographic, life events and disease factors. Emotional disturbance +vely correlated with physical disease over illness course. High incidence of emotional disturbance/life crises prior to disease onset.
Sheffield and Carney (1976) *British Journal of Psychiatry*	28 CD 17 chronic medical 43 psysom 100 neurosis	N/R*	N/R*	Outpatient	Manifest Anxiety Scale EPI	Controlled	CD sig. > than norms and chronic medical on introversion, neuroticism and anxiety, but not sig. different to psychosomatic patients on these measures.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Gazzard, Price, Libby and Dawson (1978) *British Medical Journal*	85 CD	28M 57F	35.6	Outpatients (>1 year with CD)	EPI	Uncontrolled, Self-report	Females showed equal neuroticism and introversion to norms, while males showed > neuroticism and introversion to norms. IBD adjustment is related to personality, not IBD severity.
Olbrisch and Ziegler(1982a) *Journal of Chronic Disease*	57 IBD	25 M 32 F	38.7	Outpatients	Texas Social Behaviour Inventory (TSBI) Marlowe-Crowne Social Desirability Scale Adjustment to IBD scale Information of IBD scale Public/Private self-consciousness scale	Uncontrolled	Younger patients have > IBD information/knowledge. IBD adjustment +vely related to presence of other chronic illnesses, self-esteem and social competence. IBD adjustment - vely related to public self-consciousness.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Olbrisch and Ziegler (1982b) *Journal of Chronic Disease*	143 IBD	64 M 79 F	39	Outpatients	Texas Social Behaviour Inventory (TSBI) Adjustment to IBD scale Information of IBD scale Private self-consciousness scale	Uncontrolled	IBD information unrelated to IBD adjustment. Information and adjustment inversely related for high private self-consciousness, and unrelated for low–mod levels. Information unrelated to IBD management, but +ly related to adapting to the stress of living with IBD. Perceived information usefulness related to IBD adjustment.
Helzer, Chammas, Norland, Stillings and Alpers (1984) *Gastroentlogy*	50 UC 50 CD 50 Controls	N/R*	N/R*	Outpatients	Structured Interview Feighner criteria Major life events scale	Controlled	Major life events, anxiety and neuroticism was not significantly different between UC, CD and control groups.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Greenberg and Dattore (1983) *Jnl Nervous and Mental Disease*	181 37 healthy 83 phys ills 42 psysom 25 psychtrc	Males only	62.8 61.57 57.48 44.68	Outpatients	MMPI (Alexithymia scale)	Pre-post Self-report	Alexithymia not lead to illness onset. No diff. among grps in pre-morbid alex. scores. However alex. may result from disease, lead to < t/ment response, or prolonged illness course.
Felton and Revenson (1984) *Jnl Consulting and Clinical Psychol*.	151	N/R*	41-89	RA/cancer/ diabetes/hyper-tension S's.	Coping Inventory Adjustment measure (N/R*)	Uncontrolled	Information seeking (Wishful thinking) corr. +vely (-vely) with adjustment. The effects of coping style was unrelated to illness controllability.
Parkes (1984) *Journal of Personality and Social Psychology*	171	Female only	N/R*	First year student nurses	Ways of Coping questionnaire I-E LOC Adjective Check-list (defensiveness scale)	Uncontrolled	Patterns of coping reported by intLOC, compared to extLOC, were > adaptive in relation to types of appraisal. Perceived importance of stress event sig. –vely related to suppression coping, and unrelated to LOC.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
McCrae and Costa (1986) *Journal of Personality*	406	N/R*	21-91	Community dwelling Adults	NEO Life Satisfaction Scale Potential Stressors	Self-report Spouse/peer ratings	Use of > effective coping ass. with increased subsequent happiness and life satisfaction. Ass. reduced however when personality measures were partialled out.
Parkes (1986) *Journal of Personality and Social Psychology*	135	Female only	N/R*	First year student nurses	Ways of Coping questionnaire EPQ Perceived importance of stress episode Social support Work demand	Uncontrolled	Sig curvilinear interaction displayed b/w N and work demand for direct and suppression coping. Interactions of Social support and E with perceived importance of stress event predicted direct coping. Interaction b/w N and E and b/w work demand and importance of stress event predicted suppression.
Duffy (1987) *DAI*	130 IBD	N/R*	Adults	Outpatients	Major life events Disease activity index	Uncontrolled Time-series (5.2 months) Prospective	Participants exposed to major life stressors had > risk of disease activity than those unexposed. Health-related stress exposure was the highest relative risk.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Tarter, Switala, Carra, Edwards, VanThiel (1987) *Int Jnl PsyandMed*	26 CD 27 UC 28 control	N/R*	N/R*	Outpatients	Diagnostic Interview Schedule	Controlled	27% of CD patients displayed life-time Panic disorder (compared to 7% of UC patients and 0% of controls). CD>prev of Anx/Dep.
Robertson, Ray, Diamond and Edwards (1989) *GUT*	44 CD 36 UC 40 diabetic controls	N/R*	N/R*	Outpatients and Inpatients	EPI HADS	Controlled	Neuroticism and introversion sig. > in IBD's than in controls. These traits as prominent before diagnosis as in established cases. Introversion > with IBD duration, depression occurs only in active disease. Anxiety and depression not sig. different b/w IBD's and controls.
Schwarz (1989) *DAI*	11 IBD patients 10 IBD controls	N/R*	N/R*	Outpatients	Multi-component treatment Symptom monitoring IBD stress index	Wait list control Pre-post testing	CD > UC on stress and symptom severity pre-treatment. IBD stress index improved post-treatment as did several coping indices. Depression and anxiety < post-treatment.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Bolger (1990) *Journal of Personality and Social Psych*.	50	24M 26F	20.3	Pre-medical students	Ways of Coping Scale Daily anxiety reports (Profile of Moods States) Neuroticism (EPI)	Uncontrolled Time-series (70 days)	N influenced coping efforts and daily anxiety when stressed. Wishful thinking and self-blame coping explained > ½ of relationship b/w N and anxiety.
Duffy, Zielezny, Marshall, Weiser, Byers, Phillips, Orga and Graham (1990) *AmJnl Prev Med*	74 CD	N/R*	Adult	Outpatient	IBD Symptom Index	Time series (6 months)	Current smokers experience IBD relapse at rate sig. > than non-smokers. No sig. increase in relapse rate among former smokers.
Sutherland, Ramcharan, Bryant and Fick (1990) *Gastro*.	174 CD	N/R*	42 17 – 84	Outpatient	Questionnaire on smoking status and knowledge	Uncontrolled 10 year follow-up study	Smoking independent risk factor for CD recurrence. Passive smoking > risk factor for children and of > disease severity.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Engstrom (1991a) *Journal of the Amer Acadamy of Child and Adol Psychiatry*	20 IBD 20 diabetic controls 20 healthy controls	N/R*	16.5	Outpatient	LOC for Children Child Ass. Schedule (Mental Health) Family adaptability and cohesion evaluation scale Somatic status rating scale	Controlled	IBD patients > ext LOC compared to controls. LOC correlated with IBD severity. High and low LOC correlated with severe psych disorders. IBD mothers have > family dysfunction. IBD's LOC sig. correlated with family dysfunction.
Engstrom (1991b) *Journal of the Amer Acadamy of Child and Adol Psychiatry*	20 IBD families 20 control families	N/R*	16.5 9 – 18	Outpatients	SCL-90 Interview Schedule for social interaction Child Ass. Schedule CBCL	Controlled	IBD mothers showed > distress, anxiety, depression and somatisation compared to control mothers. IBD fathers showed no sig. difference to control fathers. IBD parents displayed < social support than control parents. IBD children had > anxiety, depression and behaviour problems than control children Childs mental heath was -vely correlated with mothers social integration.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Duffy, Zielezny, Marshall, Byers, Weiser, Phillips, Calkins, Ogra and Graham (1991a & b) *Behavioural Medicine (a) and Epidemiology (b)*	124 IBD	N/R*	N/R*	Outpatient	Monitoring of behavioural and biological characteristics	Uncontrolled Prospective (6 months)	Females experience > frequent and serious disease, and > stress events than males. Females report > family and marriage stress, males > occupational stress. Unmarried, poor health perception, smoking and pain medication related to > disease activity. Stress exposed IBD's > risk of exacerbation than unexposed.
Garrett, Brantley, Jones and McKnight (1991) *Jnl Beh Med*	10 CD	4 M 6 F	41.2 (18-55)	IBD support group volunteers	Daily Stress Inventory Major life events scale Symptom/sign Diary	Uncontrolled Time-series (28 days)	Daily stress sig. correlated with symptoms and signs, but major life events sowed no sig. correlation.
Gitlin (1991) *DAI*	39 IBD 43 Controls	15M, 21F 21M, 17F	6-19	Hospital clinic Random	Perceived Stressful life events (Life Events Scale) Coping Inventory for Children	Controlled	IBD children < effective general coping styles (they are > rigid and passive copers) IBD children report < stress events than control children.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Gitlin, Markowitz, Pelcowitz, Dorstein and Klein (1991) *Advances in Child Health Psychology*	39 IBD 43 Controls 22 IBD parents 31 control parents	N/R*	Children	Outpatient	Coping Style Scale Stressful life events Psychophysiological reactivity	Controlled Self-report Parental-report	IBD children rated themselves as > rigid when coping with internal stressors, and > passive when coping with environmental demands. No sig. differences b/w IBD and control children in long-term reactions to stressful life events. Parents rated their IBD children as having < effective coping styles ct control parents. IBD parents agreed with their children's self-ratings of coping, while control parents rated their children > than they rated themselves.
North, Alpers, Helzer, Spitznagel and Clouse (1991) *Ann Int Med*	32 IBD	N/R*	N/R*	Outpatients	BDI Social Readjustment rating scale	Uncontrolled Prospective	No association btw major life events and IBD exacerbation.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Duffy, Zielezny, Marshall, Weiser, Phillips, Byers, Ogra and Graham (1992) *Jnl Tramatic Stress*	73 CD 50 UC	65 M 58 F	85% of sample in range 20-49	Outpatients	Major life events scale Daily stains scale Perceived Stress scale CD Activity Index	Uncontrolled Prospective	Perceived stress, major life events and daily strains all sig. correlated with IBD activity. Daily stains displayed a closer relation to IBD in younger patients.
Conway and Terry (1992) *Aust Journal of Psychology*	101	N/R*	17-62	University students and community residents	Description of Stress events Ways of Coping questionnaire	Uncontrolled Self-report	The effectiveness of different coping styles depends on the appraised controllability of the 'stress' event. Problem-focused coping ass. with favourable ratings of coping efficacy only in appraised controlled sitns. Neg. effects of self-denegration > marked in controllable than uncontrollable sitns.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Helgeson (1992) *Journal of Personality and Social Psychology*	96	77 M 19 F	N/R*	First cardiac event Inpatients	HRQOL Personal and Vicarious Control Multiple Affect Adj List Psyc Adj to illness Scale	Pre-post (3 months)	Perceptions of vicarious control were related to better adjustment for patients who had undergone invasive procedures by doctors. Control-adjustment r/ship was stronger under > severe threat conditions.
Gerson, Grega and Nathan-Virga (1993) *Fam Sys Med*	17 families 10 CD 10 UC	N/R*	24.8	Outpatients	Semi-structured Interview	Uncontrolled Qualitative	Positive illness beliefs and effective coping styles related to better IBD adjustment.
Kohlmann (1993) *Anxiety, Stress and Coping*	72	N/R*	N/R*	University students	Mainz Coping Inventory Trait Anxiety	Uncontrolled	Subjects demonstrating inconsistent coping styles, score high on trait anxiety.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Greene, Blanchard and Wan (1994) *Behaviour Research and Therapy*	11 IBD	7 M 4 F	47 (25 – 71)	Outpatient	IBD Symptom Diary Psychosocial Stress Diary Use of 8 Beh. Coping Strategies Mood and Affect	Uncontrolled Prospective Self-monitoring Time series (1 year – 1st week of each month)	Perceived stress sig. Related to IBD symptoms and severity. Method of coping unrelated to effects of stress on symptom severity. Severity of symptoms related to > negative emotions. IBD activity –vely affected by preceding months stress. Positive relationship b/w daily and monthly stress and IBD activity.
Dudley (1995) *DAI*	42 IBD	N/R*	N/R*	Outpatients	N/A	Uncontrolled Time-series (4 weeks) Prospective	Uncertainty +vely related to number of symptoms and distress, -vely related to social support. IBD exacerbation related to > uncertainty/symptoms/distress, and < social support than remission.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Porcelli, Zaka, Leoci and Centonze (1995) *Psychothpy and Psychosom*.	112 IBD 112 control	N/R*	N/R*	Outpatients	TAS-20 (Alexithymia scale)	Controlled	IBD patients were more alexithymic (35.7%) than controls (4.5%). Alexithymia is not significantly different between UC and CD. Alexithymia is unrelated to illness duration or activity level.
Kardum and Hudek-Knezevic (1996) *Personality and Individual Differences*	177	127 F 50 M	17.38 F 18.6 M	University students	EPQ (Croatian version) COPE Questionnaire Mood Scale	Uncontrolled Retrospective Self-report	Eysenck's personality traits showed +ve and -ve effects on moods and coping styles. Avoidance and problem-focused coping contribute to emotional outcomes and mediate effects of E, N and P on moods. E +vely related to emotion-focused coping. N and P +vely related to avoidance coping. P -vely related to problem and emotion-focused coping. Problem-focused coping +vely/-vely related to +ve/-ve mood. Avoidance coping +vely related to –ve mood.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Kauhanen, Kaplan, Cohen, Julkunen and Salonen.(1996) *Jnl Psysom Res*.	2297 M	Males only	42-60	Middle-aged males from general population	TAS-26 General information on: Medical History Health Status Behavioural Lifestyle	Prospective Follow-up (5.5years) Controlled by reference grp	High alexithymic males have a significantly increased risk of dying from any-cause compared to a reference group.
Gomez (1997) *Personality and Individual Differences*	468	252 M 216 F	14-17 16.23 M 15.87 F	Secondary School students	Nowicki-Strickland LOC TABP (Test for Youth Health) Adolescent Coping Styles	Uncontrolled Self-report	Approach coping and Age are –vely, and avoidance coping is +vely corr. with ExtLOC. For M's ExtLOC +ve corr. with TABP; age –ve corr. with avoidant coping. For F's TABP +ve corr.with avoidant coping. IntLOC, compared to ExtLOC, relates to higher coping levels. In M's with high TABP, approach coping <'s as ExtLOC >'s. In older F's with high (low) TABP, avoidance coping <'s as ExtLOC >'s, (avoidance coping >'s with ExtLOC.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Grey, Lipman, Cameron and Thurber (1997) *Nursing Research*	89	42% M 58% F	11.2 8 – 14	Diabetes Outpatients	Coping Orientation for problem experiences scale (A-COPE) Self-care questionnaire Child/Adolescent Adjustment Profile (CAAP) – interview Self-perception profile for children (SPPC)	Uncontrolled Longitudinal	Psychosocial status and coping behaviours were stable, although metabolic control worsened over 1 year. Self-worth at 1 yr post-diagnosis associated with < spirituality, but > humour and self-care. Positive self-care decreased with age. Poor adjustment at 1 yr post-diagnosis associated with > avoidance and poor self-care. Avoidance increased with age.
Lumley, Tomakowsky and Torosian (1997) *Psychosomatics*	87 HIV 180 CHD	N/R*	21-68 HIV 56.8 CHD	Outpatients with HIV or CHD symptom	TAS-20 HIV symptom check-list Blood samples Exercise –reported chest pain/induced ischemia	Uncontrolled Objective and subjective measures	Alex. +vely corr. with HIV symptoms but not CD4 counts. Alex. ass. with reported chest pain but not ischemic heart disease. Alex. related to > illness beh but not to presence of organic disease.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
^Parker, Taylor and Bagby (1998) *Comprehensive Psychiatry*	287 Adults 83 students	N/R*	N/R*	Non-clinical adults and students	TAS-20 Defence style questionnaire Coping Inventory for Stress situations	Uncontrolled Self-report	Alex. ass. strongly with immature defence style, weakly with neurotic defence style and -vely with mature defence style. Alex. corr. highly with emotion-oriented coping and distraction coping and low corr. with task-oriented coping.
Thirlby, Lan, Fenster and Lonborg (1998) *Arch Surgery*	36 CD 27 UC	16M, 20F 22M, 5F	41	Outpatients requiring surgery	Health status questionnaire	Uncontrolled Prospective Pre-post	Post-operative HRQOL improved sig., with levels comparable to norms.
Gwee, Leong. Graham, McKendrick, Colins, Walters, Underwood and Read (1999) *GUT*	22 IBS dev. 72 IBS not dev. 21 controls	14 F 30 F	37.8 41.1	Inpatients	Life Event History Whitelay Index of Hypochondriasis (WIH) Illness Behaviour profile HADS, EPI Somatization Checklist Physiological/Medical assessments	Controlled Prospective	IBS+ > IBS- on anxiety, neuroticism, life events and hypochondriasis.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Porcelli, Taylor, Bagby and De Carne (1999) *Psychotherapy and Psychosom*.	112 FGID 116 IBD 112 Controls	41M, 80F 71M, 45F 60M, 52F	40.1 37.7 37.7	Outpatients Convenience	Toronto Alexithymia Scale, HADS	Controlled, Self-report	FGID's > alex. than IBD's. FGID's and IBD's > alex. than controls.
Rubino, Biancane, Zardo, Zanna, Saya and Ciani (1999) *Percp Mot Skills*	34 CD 68 controls	23 M (CD) 11 F (CD)	18 – 60	Outpatients	The Defence Mechanism Test	Controlled (non self-report study)	CD participants rigidly use same maladaptive defences. Alexithymia and CD not linked, as they perceive, discriminate, express feelings similarly to control groups.
Casellas, Lopez-Vivancos, Badia, Vilaseca and Malagelada (2000) *Amer Jnl Gast*	119 CD 63 Controls	N/R*	N/R*	Outpatient Convenience	Health-related QOL instruments (IBDQ, PGWBI,EuroQOL,VAS)	Controlled Self-report	Active CD had lowest HRQOL, but it improved during remission.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Scioli, McClelland, Weaver and Madden (2000) *Int Jnl Age and Human Dev*	80 younger 80 older	N/R*	25 – 40 65 – 87	Outpatients with chronic illness	Interview	Uncontrolled	Younger patients used specific cognitive-behavioural strategies, while older patients derived integrative meaning when confronting stressors.
Casellas, Lopez-Vivancos, Badia, Vilaseca, and Malagelada (2000). *The American Jnl of Gasteroenterology*	48 non-op inactive CD 29 op inactive CD 42 active CD 62 control	66% F 68% F 67% F 69% F	(28-35) (32-40) (29-38) (27-36)	CD outpatients Convenience control group	IBDQ Psychologial General Wellbeing Index (PGWBI) EuroQOL	Controlled Self-report	HRQOL is impaired in active CD, improving during remission whether achieved medically or surgically.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Kardum and Krapi (2001) *Personality and Individual Differences*	265	120 F 145 M	11-14 12.56	Primary school students	EPQ (Croatian version) Adolescent Coping Scale Subjective stress	Uncontrolled Self-report	E +ve effect on problem and emotion-focused coping. N and P +ve effect on avoidance coping and subjective stress. Lie scale unrelated to coping styles. Subjective stress mediates the effects of personality (N and P) on coping (problem-focused and avoidance).
Endler, Kocovski and Macrodimitris (2001) *Personality and Individual Differences*	137 with acute illness 137 with chronic illness	41 M 96 F in each illness group	39.8 18 – 72	Visitors to a Science Museum	Coping with health injuries and problems (CHIP) Personal attitudes scale (self-esteem) Event Perception measure (perceived control)	Uncontrolled	General self-efficacy > for acute compared to chronic illness. Perceived control unrelated to illness duration, but -vely related to illness severity. Chronic illness is related to emotional preoccupation, instrumental and distraction coping, while acute illness is related to palliative coping.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Morris, Montgomery, Galloway, Pounder and Wakefield (2001) *GUT*	1958 cohort 17 CD 16 UC 1970 cohort 21 CD 19 UC	N/R*	33 26	Data	Parents Interviewed for child's hand/foot preference. Medical exam and Interview at age 10.	Uncontrolled Data on two population based national cohorts from 1958 and 1970	Left handedness is sig. ass. with M's. IBD diagnosis > likely in 1970 than 1958. Sig. > risk of IBD in left handers, adjusted for gender. No sig. ass. b/w IBD and foot preference
Sewitch, Abrahamowic, Bitton, Daly, Wild, Cohen, Katz, Szego and Dobkin. (2001). *American Jnl of Gastro*.	200 IBD	119 F 81 M	36.7	Longstanding IBD outpatients	Symptom Checklist-90R Social Support Questtionnaire-6 PSS-10 Weekly Stress Inventory Harvey Bradshaw Index (IBD Activity)	Uncontrolled Cross sectional Self-report	R/ship b/w stress and distress depends on level of satisfaction with social support. High social support satisfaction decreases psych distress at high levels of stress.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Kurina, Goldacre, Yeates, and Gill. (2001). *Jnl of Epidemiology and Community Health*.	7268 UC 5231 CD 12,678 Anx 41,324 Dep	51% UC F 59% CD F 62% Anx F 64% Dep F	35-39 25-29 30-34 (Modal Age)	Oxford Record Linkage Study. Database of inpatient/day case admissions	N/A	Uncontrolled Record-Linkage Study	Dep and Anx preceded UC, but not CD sig. more often than exp by chance. UC followed by Anx, but not Dep; and CD followed by both Anx and Dep at > exp rate. IBD > risk of subsequent Anx and Dep.
Guthrie,Jackson, Shjaffer, Thompson, Tomenson, and Creed. (2002). *Amer Jnl of Gastro*.	116 IBD 37 UC 75 CD 4 unsp.	14 F (UC) 50 F (CD)	45.9 (UC) 41.6 (CD)	IBD patients from outpatient centres	Disease Activity Index Illness Severity Measure HADS Short-Form 36	Uncontrolled Cross-sectional Self-report	Psych symptoms, severity and disorder ass. with HRQOL. Disorder → poorer HRQOL regardless of severity. CD> dep than UC, but not apparent when gender and severity adjusted.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Goldring, Kemeny and Anton. (2002). *Health Psychology*.	218 IBD 57% CD 43% UC	54% F	47.7 (22-78)	Active IBD patients from UCLA IBD centre	Measure of perceived threat, Short Form-36 (gQOL), McMaster IBD QOL Scale, perception of r/ship with physician	Uncontrolled Self-report	For > symptoms – costs and benefits predicted medication taking intentions. For<symptoms, costs more impt by decreasing intentions. Dr's > success to encourage t'ment if patient involved in decision-making process. Shared dec-making ass. with IBDQ/gQOL and disease threat –ve ass with IBDQ/gQOL
Bitton, Sewitch, Peppercorn, deB Edwardes, Shah, Ransil and Locke (2003). *Amer Jnl of Gastro*.	60 UC	37 F	39	UC patients	Life Events Scale Symptom Checklist-90 PSS	Uncontrolled Self-report Longitudinal	> number of recent stressful events ass. With earlier relapse.
Vega and Rodriguez. (2004). *Behav Research and Therapy*.	45 CD	64% F 36% M	31.7 (19-52)	Non-active CD patients	Semi-structured Interviews CD symptom Diary	Controlled Experimental stress Mx vs. medical t/ment (as control)	Symptoms sig reduced for self-directed stress Mx grp than stress Mx conducted by psych. No sig. change in symptoms for control (medical t'ment) grp.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
van der Zaag-Loonen, Grootenhuis, Last and Derkx. (2004). *Quality of Life Research*.	65 IBD	53% F	15.4 (12-18)	IBD adolescents from hospital registries	Utrect Coping List (UCL-A) Impact-II (NL) (QOL) Cognitive Control Strategy Scale for Children (CCSS-c)	Controlled with norms data	IBD adol use > Avoidance coping then healthy peers. >predictive cope and < depressed rxn pattern ass. with > HRQOL. F<HRQOL than M >IBD severity ass. with < HRQOL
McLean, Harvey, Pallant, Bartlett and Mutimer (2004). *Rehab. Psych*.	53 Mothers representing their OPBI children	53% M 47% F (children)	20-59	Mothers of children with OPBI	OPBI Severity Scale, Parents of children with disabilities Inventory, SSQ-6, Family APGAR, PCOISS, LOT-R, GHQ-12	Uncontrolled Parental report and Child Self-report	Sig. dirct r/ship b/w high stress and distress (poor adj). Optimism moderates this r/ship.
Hall, Rubin, Dougall, Hungin and Neely. (2005). *Journal of Health Psychology*.	31 IBD	19 F 12 M	N/R*	IBD patients with lowest quintile QOL scores	Semi structured Interviews and Focus groups.	Uncontrolled Qualitative	IBD patients fight for health related norality in many ways. There is a need for the appearance of normality to others. Participation in the focus groups provided a therapeutic effect.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Bernstein, Wajda, Svenson, MacKenzie, Koehoorn, Jackson, Fedorak, Israel and Blanchard. (2006) *The Am.Jnl Gastro*	364 CD 217 UC 433 controls	62.6% F 54.6% F 73.4% F	18-50	Data from IBD research registry	Family demographics Food ingestion Education, employment and medication	Case-controlled (Population-based) Self-report Retrospective	Predictive variables for CD/UC: <likely to live on farm/drunk unpasturized milk/eaten pork. CD sig ass with: Jewish/ 1st degree relative with CD/smoking. Hygiene hyp. Supported.
Calsbeek, Rijken, Bekkers, Van Berge, Henegouwen and Dekker. (2006). *Psychology and Health*.	521 digestive disorders (190 IBD) 274 controls	45.9% - 70.1% F across all groups	12-25	Adol and young adults with chronic digestive disorders	Physical complaints HADS TACQOL CISS-21 (Coping)	Controlled Cross-sectional	No cope diff's within or b/w disorder grps or control. Younger used < no. coping strats. Highest scores on task-oriented coping, lowest on emotion-oriented coping. Avoidance ass with going out/friendship. Task-oriented ass with edu. Emotion-oriented –ve ass with friendship.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Mackner and Crandall. (2006) *Journal of Pediatric Psychology*.	50 IBD 42 controls	59% M	14.39	Adolescents with IBD and their parents	Parents: CBCL, Family Assessment Device (FAD) Child: Pediatric CD Activity Index (PCDI)	Controlled	IBD>anx, dep and social probs than controls. IBD diagnosis ass with < social competence even 1 yr post-diagnosis.
Cunningham, Drotar, Palermo, McGowan, and Arendt. (2007). *Children's Health Care*.	49 IBD 49 control	27 F 27 M	14.96 14.15	IBD outpatients from tertiary care childrens hospital	Child health questionnaire (QOL) (parent/child forms) HBSI (wellbeing) IBD and steroidal symptom Index	Controlled Self-report Cross-sectional	Parent report: IBD children> limited of physical and psych health, Anx, Dep. >IBD symptoms → < HRQOL IBD children < general health (Child rep). Parents rep.>impact of IBD on childs HRQOL than children rate themselves.

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Kovacs and Kovacs. (2007). *International Journal of Psychiatry in Medicine*.	43 IBD 46 IBS 44 control	63% F 70% F 75% F	38.4 39.8 41.6	Patients from tertiary care Gastro. Centre	Social Dimension Scale (SDS) Schedule of recent Events BDI STAI (Anxiety) Dysfunctional Attitude Scale (DAS)	Controlled Self-report	No diff in stressful life events or social support b/w grps. Patient grp > anx/dep than control IBS>dep than IBD IBS>dysfunctional attitudes than IBD and controls.
Moreno-Jimenez, Blanco, Rodriguez- Munoz and Hernandez. (2007). *Journal of Psychosomatic Research*.	60 UC 60 CD	25 F 31 F	29-68 18-75	IBD outpatents	IBDQ Rosenberg Self-esteem Scale EPI Difficulty describing feelings scale	Unontrolled Self-report Cross-sectional	Neurot. –ve ass with HRQOL. Self-esteem +ve ass with HRQOL Diff desc. feelings –ve ass with HRQOL

Table 2.1 (cont.) A Summary of Relevant Studies Since 1970

Author/s (year)/Journal	Sample size	Gender	Mean age/ age range	Sample type	Measures	Design	Outcome
Larsson, Loof, Ronnblom, and Nordin. (2008). *Journal of Psychosomatic Research*.	742 IBD	365 M	45 19-65	IBD patients attending Gastro/surgery depart. Within hospital	Jalowiec Coping Scale Short form-36 Short Health Scale HADS	Unontrolled Self-report Cross-sectional	>disease activity → impaired HRQOL and emot distress. Optimistic, self-reliant and confrontive coping most used strategies. No ass b/w coping and HRQOL.
Kiebles, Doerfler, and Keefer. (2010). *Inflammatory Bowel Diseases*.	21 UC 17 CD	N/R*	22-68	IBD outpatients	IBDQ;Short Form-12 IPQ-R(Illness perception) PSQ (Perceived Stress) BSI (Brief Symptom) DDAQ(Disease Accept) The Brief Cope PDS(PerceivedDisability)	Uncontrolled Self-report Cross-sectional	Better adjustment ass with > bowel and systemic health, increased engagement activities and symptom tolerance, less pain, less perceived stress and fewer clinic visits.

2.3 Narrative summary of Table 2.1

Of the literature reviewed in Table 2.1, 43 studies involved participants with IBD. Twenty-three studies utilized an IBD-only group, while 11 studies split the group based on illness type (CD vs. UC). Eight studies used only participants with CD as the illness of concern (Casellas et al., 2000; Duffy et al., 1990; Garrett, Brantley, Jones, & McKnight, 1991; Gazzard, Price, Libby, & Dawson, 1978; Rubino et al., 1999; Sheffield & Carney, 1976; Sutherland et al., 1990; Vega & Rodriguez, 2004) and one study just included participants with UC as their target group (Bitton et al., 2003). The majority of IBD participants were outpatients recruited through tertiary care centres. One study utilized members of an IBD support group (Garrett et al., 1991), while four studies used data from a national database of registered IBD participants (Bernstein et al., 2006; Kurina, Goldacre, Yeates, & Gill, 2001; Morris et al, 2001; van der Zaag-Loonen, Grootenhuis, Last, & Derkx, 2004). Only one study recruited both inpatients and outpatients with IBD (Robertson et al., 1989).

Of the 64 studies reviewed in Table 2.1, no study systematically and simultaneously compared IBD groups based on illness classification (CD vs. UC), illness severity (mild vs. severe) and with the use of a non-IBD comparison group. For example, Helzer et al. (1984) and Tarter et al. (1987) compared CD and UC participants with a healthy control group on a number of measures; yet they did not compare CD and UC participants with regards to illness severity. On the other hand, Greene et al. (1994) and van der Zaag-Loonen et al. (2004) investigated disease activity/severity among IBD volunteers, but failed to explore CD and UC differences. Larsson et al. (2008) explored both severity

and IBD classification differences within their sample, but failed to include a comparison group who did not have long-term medical complications.

Overall, 44 of the 64 reviewed studies failed to incorporate a comparison group as part of their study design. Twenty-seven of these involved participants with some form of IBD; 21 studies analysed only IBD participants, five studies recruited only CD participants and one study included only UC participants. Twenty of the 64 reviewed studies did use a comparison group as part of their study design, however two of these utilized population based data or reference groups as the comparison sample (Bernstein et al., 2006; Kauhanen et al., 1996). Although 16 of the controlled studies recruited IBD participants; only nine of these studies recruited adults as their participant group - the remaining seven studies used children or adolescents.

A number of the most relevant studies reviewed in Table 2.1 will be discussed in greater detail under the appropriate headings within the remainder of this chapter. Despite some of these research papers using a similar design and measures to the present study; it will be emphasized that the majority fail to incorporate a comparison group without illness, use only a limited number of outcome measures or recruit only a small sample of participants. Furthermore, the bulk of the reviewed studies are atheroretical and are consequently of questionable value. It will be highlighted that as the present study incorporates all these factors (i.e., comparison group, large sample size, a number of outcome measures and a theoretical framework), it provides much needed information to the area of health psychology and adjustment to chronic illness.

2.4 Stress

The following section gives a brief description of stress and how it can affect an individual's general health, in particular the course of IBD.

"Stress" means different things to different people, and is associated with a great variety of essentially dissimilar problems (Schafer, 1987). Stress is a normal part of human daily experience. However, as stress cannot be avoided, attempts should be made to ensure that its levels are contained and managed within reasonable limits (Selye, 1976).

Selye (1976) was the pioneer of stress research. He described stress as a physiological reaction occurring as a response to many different stressors. More recently the word "stress" typically involves the demands placed on an individual, as well as the individual's responses made to those demands (Lazarus, 1994). That is, cognitive appraisal and coping style are seen to play an integral role in the experience of stress. The cognitive model of stress proposed by Lazarus (1994) shows that there is a potential for stress when an environmental situation is perceived as presenting a demand, which threatens to exceed the individual's capabilities and resources for meeting it.

Individuals actively seek to evaluate stressful events to determine their level of threat. The amount of stress individuals experience in a given situation is determined by the objective conditions it involves and also by *cognitive appraisal* of these conditions (Lazarus, 1994). Stress therefore, occurs only to the degree that the individual perceives the situation to be harmful or threatening. If the situation is not viewed as such, stress

will not be experienced; even if objective stress-inducing conditions are apparent (Coon, 1992).

Lazarus (1994) emphasized that "stress is a state that is experienced when the demands that are made upon an individual cannot be counterbalanced by their ability to deal with them". It is how an individual sees those demands, and how well they believe they can cope with them, that will ultimately decide whether they feel overwhelmed or undisturbed (Jones, 1997). Individuals who believe in their ability to exert control over events (i.e., those with an internal locus of control), are more likely to effectively deal with stress (Kobaska, 1979).

Individuals also respond to stress *overtly*, with a range of coping behaviours. Such behaviours include attempts to gather information about the stressful event, dealing with the stressful event directly, or by using intrapsychic strategies designed to make individuals feel better (e.g., drinking, medication, avoidance or denial), but not attempting to resolve the stressful event itself (Grossarth-Maticek & Eysenck, 1991).

The various responses to stress involve physiological responses, internal psychological states, and overt behaviours. It is evident that these responses may in turn affect an individual's behaviour, their relationships with others and even their health.

2.4.1 Stress and Health.

The traditional view of illness as a solely biological phenomenon has shifted towards a biopsychosocial model; incorporating biological, psychological and sociocultural factors (Coon, 1992). During the twentieth century, contagious diseases such as typhoid fever and influenza declined as a threat to health. However, the death rates from *stress-related* chronic diseases, such as cancer and stroke, have dramatically increased (Grossarth-Maticek & Eysenck, 1991). Over the past few decades, research has established an abundance of evidence suggesting an associative and possible causal link between stress and physical illness.

Mayer (2000) claimed that stressful life events represent a threat to homeostasis, and trigger a physiological response aimed at adaptation and survival in the short term (i.e., the flight-fight response). This response however, can cause damage and exacerbate disease processes if sustained over long periods of time. In general, the longer an individual experiences stress, the greater their immunosuppression (Sternbach, 1986), and if left unresolved, stress can have deleterious effects on mental and physical wellbeing. Much research has shown long-term stress to be linked to many illnesses including cancer and stroke (Grossarth-Maticek & Eysenck, 1991), cardiovascular disease (Costa & McCrae, 1987) ulcers, and digestive system malfunctions (Milsum, 1984; Watson & Pennebaker, 1989), including IBD (Jones, 1997).

Although research has illustrated stress to be a result and a cause of illness, this *causal* link has not been firmly established. Summers, Barland and Walker (1991) state that

stress may increase the risk of illness, but as most of the research in this area is correlational, it cannot be definitively concluded that stress *causes* illness. Other contributing factors that may induce illness include: heredity, specific organ weaknesses and learned reactions to stress. Therefore, although many studies have illustrated that increased levels of stress are associated with poor personal health (Sharpley, 1994), it cannot be assumed that stress alone is a cause of illness (Holzer, 1998). Hislop (1991) indicated that it is more likely the resulting psychological state of stress, rather than the stressful event itself, which is responsible for initiating illness.

Research into the influence of thoughts and emotions on the body's immune system suggests that it is not just germs or genes that contribute to illness. An individual's thought processes and emotional reactions may also be responsible for illness (Scheier & Carver, 1985). As the immune system is, in part, regulated by the brain; perceived stress, negative emotions and destructive thoughts can all be seen to affect the immune system, thereby leading to an increased susceptibility to illness (Milsum 1984).

2.4.2 Psychosomatic illness.

It is evident that emotional antecedents are more frequent or striking in some illnesses, than in others (Sternbach, 1986). The role of psychological factors in disease has been emphasized by many psychiatrists, psychologists and physicians. This field has come to be known as psychosomatic medicine. Psychosomatic disorders are conditions of organic damage stemming in part from emotional problems. That is, an emotional cause such as stress, acts together with a physical cause to produce the illness. Current views

of psychosomatic medicine emphasize that many factors including stress, emotions, coping ability, nutrition and genetics all play a role in the expression of human disease (Hislop, 1991).

The psychosomatic literature on personality features, psychiatric comorbidity, stress events, and other emotional and relational aspects of IBD is still controversial (Rubino et al., 1999). Jones (1997) however, claimed that ulcerative colitis and Crohn's disease are two medical conditions that may be induced by stress. Other psychosomatic conditions identified include: hypertension, arthritis, migraine, acne, and multiple sclerosis.

Many individuals mistakenly believe that if an illness is psychosomatic, it is "all in the head", and so either imaginary; a sign of malingering; or due to a defect in character (Hislop, 1991). This is not the case, and should not be confused with hypochondriasis. Grace and Graham (1952, in Sternbach, 1986) conducted a clinical study of 128 volunteers with 12 different psychosomatic diseases or symptoms. It was found that the volunteers with the same disease used similar words to describe their attitudes towards events that occurred just before the onset of the symptoms. That is, a relationship was found between the attitude of an individual toward a stressful event, and the physiological changes that occur in response to the event. For example, when faced with a stressful event, individuals who developed hypertension were found to have the general attitude of feeling threatened with harm and a need to be ready for anything. When faced with this same stressful situation, the general attitude taken by individuals with IBD was that they had received something harmful and wanted to get rid of it (Sternbach, 1986).

2.4.3 Emotions and GI functioning.

Health and wellbeing can be attributed to by the *way* an individual deals with their emotions, rather than the type of emotions experienced. A lack of connection to ongoing life, and emotions such as apathy, resignation and hopelessness have been linked to illness and disease (Remen, 1989); while a "fighting spirit" and the "will to live" have been shown to mediate the role of emotions in survival (Totman, 1990).

Anecdotal reports have suggested that strong emotion is associated with changes in GI functioning and gastric acid secretion (Almy, Abbott, & Hinkle, 1950; Pennebaker, Kiecolt-Glaser, & Glaser, 1988; Pettingale, Greer, & Tee, 1977). In 1833, a US Army surgeon observed that when a victim who was wounded in the stomach, experienced fear, anger, or impatience, his stomach mucosa produced less gastric juice. In 1928, another physician observed an increase in his own gastric-acid secretion after witnessing a robbery. He further observed that the levels of this secretion remained high, while his fear of gangsters persisted (Thompson, 1993).

Almy (1950) was the first known researcher to conduct a series of experiments designed to illustrate the effects of emotion on the colon. In one experiment, a student volunteered to have his colon examined. During the procedure the student was led to believe that he may have colon cancer. At that point, the mucosal lining of the bowel was observed to blush and contract vigorously. Once the student was reassured that he did not have cancer, his colon relaxed and resumed its normal colour. Another of

Almy's (1950) experiments involved measuring the colon pressure of a woman during a stressful interview. Colon pressure fell when the woman became saddened, and rose when she became angry. It was also observed that repeated application of the same stressor was less likely to affect the colon functioning, as the subject no longer became frightened. Using a radio device positioned in the small intestine of willing participants, McRae, Younger, Thompson and Wingate (1982) recorded pressure waves in response to various anxiety or frustration provoking stimuli. These participants were seen to display altered small intestinal movements when such stimuli were encountered. Almy et al. (1950) concluded that in participants with an irritable bowel; "the disorder is not in the bowel but in the environment, and in the patients' attitude towards the environment".

Although it cannot be predicted whether the same reactions will occur in all individuals, or even the same individual at a different time; there is no doubt that stress and emotions can alter all segments of GI functioning and manifest themselves in a variety of GI reactions and symptoms (Thompson, 1993). Collins (2001) illustrated that high emotional disturbance can precipitate IBD onset, and that the course of IBD may be related to the expression and suppression of intense emotion or conflict. There is also evidence that the experience of negative emotions is positively related to the severity of IBD symptoms (Greene, Blanchard, & Wan, 1994; McKegney et al., 1970).

2.4.4 Literature on stress and IBD.

It is widely recognised that GI symptoms occur when an individual is stressed or anxious (Maunder, 1998). It is also evident that individuals become stressed and concerned when the painful and embarrassing symptoms of IBD occur (Gazzard et al., 1978). The relationship between stress and active IBD is therefore thought to be self-perpetuating and mutually reinforcing (Duffy, 1987; Gitlin, Markowitz, Pelcovitz, Dorstein, & Klein, 1991). Although emotional stress cannot be claimed to cause IBD, IBD exacerbations may be triggered by unmanageable stress or serious emotional upset (Sajadinejad, Asgari, Molavi, Kalantari, & Adibi, 2012; Scala, 1990). It is also possible that psychological stress results from a flare-up of the disease (Thompson, 1993). Olbrisch and Ziegler (1982a) illustrated that the degree to which IBD participants felt stressed, strongly related to their adjustment towards the disease.

Some writers have suggested that stress is related to the onset, exacerbation and progression of IBD, through stimulating and sustaining an inflammatory response (Duffy et al., 1992; Gwee et al., 1999; Olbrisch & Ziegler, 1982b; Thompson, 1993). Duffy (1987) and Greene et al. (1994) claim that emotional stress is likely to affect IBD activity via both psychological and physiological responses. Both IBD participants and physicians have provided anecdotal reports of a "stress – IBD activity" relationship (Casati & Toner, 2000; Holzer, 2000; Robertson et al., 1989). Robertson et al. (1989) reported that 70% of IBD volunteers were able to identify a reason for developing their condition, the most common being stressful events and a nervous personality. In

addition, they illustrated that 27% of chronic IBD participants and 50% of new IBD participants possessed a significant level of anxiety.

In their 1987 study, Sorensen, Olsen and Binder found that 64% of individuals with Crohn's disease reported the occurrence of stressful events in a 3 month period before the onset of symptoms. Furthermore, according to Lukash and Johnson (1975) emotional stress can precipitate or exacerbate Crohn's disease. Other studies have also clearly demonstrated the increased risk of IBD onset or exacerbation following severe and sustained life stress and serious life crisis six months prior (Gwee et al., 1999; Shabsin & Whitehead, 1991).

In addition, Thompson (1993) found that participants with IBD who do not respond to drug/chemical therapy, frequently display symptom improvement with little change in medication, when admitted to hospital. This temporary removal from daily concerns and stress appears to be therapeutic. This finding is supported by the results of a study by Vega and Rodriguez (2004) who revealed that IBD symptoms were significantly reduced in a group of participants undergoing self-directed stress management, compared to those treated purely with a medical regime.

Certain groups of IBD participants have been identified to have specific IBD-related concerns. Concerns regarding attractiveness and body image are more prevalent amongst females. Individuals with CD, compared to UC, are more anxious about pain and suffering, finances, achieving full potential, and being a burden. While prevalent across all groups is; worry about a lack of energy, medication effects, surgery and the uncertainty of their illness (Drossman et al., 1991; Maunder & Esplen, 1999). Ironically,

health-related concerns were found by Duffy et al. (1991a) to contribute to the highest relative risk of IBD activity. It was also found that perceived stress was positively correlated to IBD severity, even when controlling for individual differences (Greene et al., 1994).

2.4.4.1 Stress Measures in IBD research.

Although many studies have identified a link between stress and IBD exacerbation (Collins, 2001; Duffy, 1987; Duffy et al., 1991a; Duffy et al., 1991b; Shabsin & Whitehead, 1991) others have not been able to support this association (Brantley & Jones, 1993; Fava & Pavan, 1976; Helzer et al., 1984). Such inconsistencies may be due to the use of differing stress measures. As documented in Table 2.1, most studies observing the relationship between stress and IBD use either the daily stress inventory or the catagorical measure of major life events. As these measures of stress are qualitiatively different, they may also elicit different findings (Maunder & Esplen, 1999).

Using the daily stress inventory, Brantley and Jones (1993) found that daily stress was associated with the exacerbation of many stress-related disorders. Garrett et al. (1991) identified that daily stress was significantly correlated with symptoms of IBD. Duffy et al. (1992) also revealed that daily strains influenced IBD activity, especially in younger participants.

With the use of the major life events scale, Garrett et al. (1991) observed that major life events were not significantly correlated with IBD activity. North, Alpers, Helzer,

Spitznagel and Clouse (1991) also revealed that major life events and IBD exacerbation were not associated. Contrary to these studies however, Bitton et al. (2003), Duffy (1987) and Duffy et al. (1991) found that the frequency of major life events experienced by an individual contributed significantly to IBD activity.

In a follow-up study, Duffy et al. (1992) revealed that the major life events scale and the perceived stress scale (PSS) produce a similar correlation with IBD activity. Bitton et al. (2003) also identified that perceived stress (using the PSS) contributed significantly to IBD flare-ups. Using a monthly symptom diary and a psychosocial stress diary, Greene et al. (1994) identified that monthly stress carries beyond that month, to predict IBD symptoms in the subsequent month. That is, individuals who displayed symptoms of their condition, reported stress during the preceding month. Collins (2001) studied the effects of perceived stress on GI inflammation using the Perceived Stress Questionnaire (PSQ). In contrast to the findings of Greene et al. (1994), Collins (2001) identified that IBD exacerbation was not correlated with short-term perceived stress (1 month prior), major life events, or other confounding variables. Using the long-term PSQ (8 month duration) however, Collins (2001) did show that a high score on this measure tripled the risk of having an exacerbation over the following 8 months.

The PSQ was devised to measure stress in chronic disease participants. Duffy et al. (1992) and Collins (2001) stated that the benefits of using this measure were that it would avoid some of the recall bias involved with retrospective questionnaires and having to name specific stress events and daily strains. The PSQ was therefore recommended as the measure to use when conducting research in the area of stress and illness. The use of self-report stress measures is however a major limitation with studies

in stress-health research. Gitlin et al. (1991) claimed that as IBD participants have difficulty reporting and recognizing stress, inaccurate self-report data is likely to be obtained. As a consequence, the use of self-report measures may explain the inconsistent results concerning the stress-IBD relationship. Inconsistent results for the relationship between stress and IBD are however most likely due to individual variation (Garrett et al., 1991). Gitlin et al. (1991) suggested that the stress-IBD relationship is highly likely to be mediated by the varied personality styles of participants.

2.5 Stress Buffers - Predictors of Adjustment and Wellbeing

An increasing body of research indicates that the effects of stress may be modified by various psychological factors (Folkman, 2010; Lazarus, 2006; Sharpley, 1994). Certain personality types or personal dispositions are seen to be more susceptible to the negative outcomes of stress than are others. Particular coping strategies and control orientations are also observed to protect individuals against the negative effects of stress and in turn contribute to wellbeing (Hislop, 1991). When an individual possesses adaptive personal resources, such as a positive attitude, effective coping strategies (Lazarus, 1994) and perceived internal control (Norwack, 1989); they are more able to tolerate, reduce or conquer the perilous symptoms of stress. These personal characteristics are also illustrated to predict overall wellbeing and adjustment.

In the research on psychological predictors of health and wellbeing, negative affective predispositions and unhelpful coping styles are often cited as predictors of illness (Cohen & Pressman, 2006), while the role of positive affective styles has been relatively

ignored. Pressman and Cohen (2005) suggest that one of the reasons for this neglect is that studies on depression and health are twenty times more prevalent than studies on happiness and health – despite recent interest in so-called "positive psychology" (see Seligman & Csikszentmihalyi, 2000, for an introduction to positive psychology). In the present study therefore, measures of both positive and negative affect, Neuroticism and Extraversion, as well as effective and ineffective coping-control styles have been included in the battery of predictor variables – see Method Section Chapter 2.

A description of each of these personal resources, how they can protect an individual against the negative effects of stress, and how they relate to IBD and wellbeing will be discussed in the following sections.

2.5.1 Personal dispositions.

Personality is described as a collection of emotional, thought and behavioral patterns that is unique to an individual and consistent over time (Allport, 1937). Personality traits are distinguishing characteristics of a person, a readiness to think or act in a similar fashion in response to a variety of different stimuli or situations.

Neuroticism (N) is defined as an enduring tendency to experience negative, distressing emotions and to possess associated behavioural and cognitive traits (Costa & McCrae, 1987). This trait has been found to relate to various negative emotions, while inversely related to positive emotions (Izzard, Libero, Putnam, & Haynes, 1993). Individuals who score high on N are more likely to experience feelings such as anxiety, anger, guilt, and

depression (Matthews & Deary, 1998). They are more likely to interpret minor frustrations as hopelessly difficult, and ordinary situations as threatening. They are often self-conscious, shy and are relatively less able to control urges and delay gratification. Perceived stress is found to be more common among highly neurotic individuals, as they are less able to cope with stress. Individuals high in N live a more stressful life; not in the sense that they encounter more stressful stimuli, but because identical stressful stimuli produce a greater amount of strain in those individuals high in neuroticism, than in those low in this dimension (Costa & McCrae, 1987). Furthermore, individuals high in N will tend to perceive more situations as being stressful (Costa & McCrae, 1980). Neuroticism is considered to be a predisposition for traditional neuroses, such as phobias and other anxiety disorders. Individuals who score low in N are more emotionally stable and less reactive to stress. They tend to be calm, even tempered, and are less likely to feel tense or rattled. Amongst the best known personality scales which measure the dimension N are Eysenck's Personality Questionnaire (EPQ or EPI) and Costa and McCrae's (1992) NEO-PI.

Negative affect (NA) is another characteristic that has been linked to perceived stress (Watson & Pennebaker, 1989). This affective state reflects a general dimension of subjective distress, and subsumes a broad range of aversive mood states including; anger, guilt, fearfulness and depression (Watson & Clark, 1984). Negative affect is seen to correlate highly with worry and anxiety (Emmons & Diener, 1985) and is significantly related to self-reported stress and health complaints (Watson, Clark, & Tellegen, 1988). Individuals *high* in NA are more likely to experience significant levels of distress and dissatisfaction at all times and in any given situation, even in the absence of any overt stress. They tend to dwell on their failures and shortcomings, and tend to

focus on the negative aspects of life. Individuals *low* in NA, tend to repress or deny any negative events. This behaviour may allow such individuals to maintain a pleasant mood and positive self-image through the frustrations of life. It may also contribute to the minimal amount of perceived distress they report (Watson & Clark, 1984).

The most commonly used measure of positive and negative affect was constructed by Watson, Clark and Telligen (1988) to accommodate the need for a reliable and valid scale of affective disposition that is brief and easy to administer. They constructed two 10-item mood scales (shown in Appendix B) that make up the Positive and Negative Affect Schedule (PANAS). These scales were shown to be largely orthogonal, internally consistent and stable. According to the authors, "trait PA and NA roughly correspond to the dominant personality factors of extraversion and anxiety-neuroticism, respectively…(and) low PA and high NA (both state and trait) are major distinguishing features of depression and anxiety, respectively" (p. 1063). Of particular relevance to the present study is the general finding indicating that the two mood measures relate to different variable categories. According to the schedule's developers, "NA--but not PA--is related to self-reported stress and (poor) coping, health complaints and frequency of unpleasant events. In contrast, PA--but not NA--is related to social activity and satisfaction and to the frequency of pleasant events" (p. 1063).

Both N and NA have been found to be significant components of many self-report stress measures. Furthermore, they both strongly correlate with increased reporting of health complaints (that is, *subjective* health complaints) (Watson & Pennebaker, 1989). Neuroticism has been linked to somatic complaints and illness behaviour (Affleck, Tennen, Urrows, & Higgins, 1992; Barefoot, Beckham, Peterson, Haney, & Williams,

1992) as well as illnesses such as cancer (Grossarth-Maticek & Eysenck, 1991). It has been suggested therefore that these personality traits may act as mediating variables between stress and illness. It has been proposed, that the individual high in N or NA, is more attentive to bodily changes, more apt to interpret unusual sensations as signs of illness, and more likely to worry about possible diseases (Watson & Pennebaker, 1989). Costa and McCrae (1987) indicated however, that although there is no definite evidence that such personality characteristics lead directly and causally to life-threatening disease; they may be seen as a potent determinant of health status.

Watson and Pennebaker (1989) raise an important issue, when discussing the relationship between health and personality correlates. They state that NA has not been consistently related to *objective* measures of health status. They suggest that the pattern of relationships between NA and health *complaints*, but not health *status* may account "for much of the correlation between reported hassles and health complaints". Watson and Pennebaker (1989) concluded that NA can be expected to act as a general nuisance factor in health research, "one that taps important but organically spurious variance in symptom measures". Correlations between this dimension and other subjective health measures must therefore be interpreted with caution.

As mentioned earlier, negative personal predispositions are the most common factors utilized when studying the relations between personality and health (Cohen & Pressman, 2006). To date, positive personal factors have been relatively ignored. The present study therefore, incorporates a number of measures which may be viewed as having more favourable health outcomes if possessed by individuals who are stressed.

These positive personal predispositions include positive affect, optimism and self-esteem.

Pressman and Cohen (2005) define positive affect (PA) as "the feelings that reflect a level of pleasurable engagement with the environment such as happiness, joy, excitement, enthusiasm, and contentment. These can be brief, longer lasting, or more stable traitlike feelings" (p. 925). In their extensive review of the PA-health literature, Pressman and Cohen observed that despite the widely held belief that PA is good for health, their literature search revealed that studies on "depression and health" are 20 times more frequent than those concerned with "happiness (PA) and health".

An important issue in the PA literature – with important implications for psychological practice, is whether or not PA and negative affect (NA) are independent characteristics or whether they simply represent extremes on the same scale (Molloy, Pallant, & Kantas, 2001). If PA and NA are just extremes on the same scale, the purported health benefits of PA may simply reflect the absence of NA. Conversely, if PA and NA are shown to be independent then, logically, PA can provide health benefits that are independent of NA levels. For this reason the questionnaire battery of the present study included measures of both positive and negative attributes and related constructs of neuroticism and extraversion. In fact, Pressman and Cohen noted from their review that studies of NA and health-related studies do not control for PA.

Pressman and Cohen observed that self-reported health status is often related to the absence or presence of disease, but these reports are also influenced by an individual's psychological make-up – it doesn't seem to matter whether such dispositions are

temporary (state) or long term (trait). In fact, individuals scoring high on measures of state and trait NA "report more symptoms than one would expect from their underlying disease and individuals high in trait PA report fewer and less severe symptoms when objective markers of disease are held constant" (p. 938). In summary, they concluded that the association between PA and self-reported health may be due primarily to the influence PA has on how individuals perceive their bodies rather than by the effects PA has with regards to physiological processes.

Optimism is another personal disposition, which refers to the inclination towards viewing the world with positive and hopeful beliefs, expectations and attitudes. It is the disposition to hope for the best, to look on the bright side of things under all circumstances, and believe that good will ultimately prevail over evil (Turner, 1987). Optimistic individuals tend to persist in the face of difficulties, rather than simply giving up. This personal dimension has been linked to improved psychological and physical wellbeing, and to a greater likelihood of recovering from major illnesses (Scheier & Carver, 1985).

The present study has included self-esteem as a potential personal disposition which may act as a stress buffer as well as influence health and wellbeing. Self-esteem is defined as "a stable sense of personal worth or worthiness" (Baumeister, Smart, & Boden, 1996). Many studies have revealed a significant negative relationship between self-esteem and distress/maladjustment (Abel, 1996; Aleixo, Blud, & O'Keeffe, 1997; Blairy et al., 2004; Kreger, 1995). It has also been identified that self-esteem moderates the effects of stress on psychological functioning. Individuals with low self-esteem exhibit more distress from negative events than those with high self-esteem. High self-

esteem may protect the individual from distress by allowing them to feel less vulnerable and be more able to bounce back from stressful situations. High self-esteem may also result in more active and effective coping and in enhanced motivation in response to stress (Abel, 1996).

In a more recent study, Endler, Kocovski and Macrodimitris (2001) noted differences in self-esteem scores between acute vs. chronic illness participants. They reported that general self-esteem scores were significantly higher for participants with an acute illness, compared to those with chronic illness.

2.5.1.1 Literature on personal dispositions and IBD.

An early held belief was that IBD, especially UC, was psychogenic. That is, the illness resulted from repressed psychological conflict or from maladaption to stress (Thompson, 1993). The theory held, that a predisposing personality, associated with a biological cause led to the clinical expression of the disease. For many years it was a strongly held notion that a "colitis personality" could be easily identified; and that it was this personality type that was somehow responsible for the disease (Robertson et al., 1989). Although this concept is now obsolete, Gazzard (1987) noted that as the first symptoms of IBD occur most often during adolescence, when personality is still developing, these negative effects are bound to influence an individual's personal make-up.

Table 2.1 contains a number of studies which suggest certain personal characteristics are common to individuals with IBD. For example, IBD participants are reported to be

neurotic; introverted; depressed; anxious; passive; dependent; immature; alexithymic; obsessive-compulsive; emotionally guarded and highly vulnerable to stress (Kurina et al, 2001; Porcelli, Taylor, Bagby, & De Carne, 1999; Robertson et al., 1989; Shefield & Carney, 1976; Tarter, Switala, Carra, Edwards, & Van Thiel, 1987). A limitation of these papers were that they either failed to encorporate a comparison group or utilized a control group that was affected with another chronic illness. Two studies were identified that included a group of healthy participants – uncompromised by illness (Gitlin, 1991; Mackner & Crandall, 2006), yet both studies recruited children / adolecents as their target group. Gitlin (1991) reported that children with IBD (*n*=39), compared to controls (*n*=43) had a poor tolerance to frustration and avoided responsibilty and risk, in favour of security (Gitlin, 1991). Mackner and Crandall (2006) observed that IBD adolecents (*n*=50) displayed greater anxiety, depression and social problems compared to their healthy peers (*n*=42). As the reviewed literature demonstrates, no reliable and valid evidence has emerged – from well-designed and controlled studies – to suggest a link between personality and a diagnosis of IBD in adults. The present research aims to resolve this issue by recruiting an adult sample of IBD participants along with a matched comparison group without the condition.

Despite little evidence that psychological factors cause IBD, certain personality characteristics have been suggested to affect individuals' ability to cope with their disease, and influence their wellbeing, QOL and illness adjustment (McCloud, 2000). Gazzard et al. (1978) interviewed 85 CD outpatients, of whom 11 reported "feeling poor". The majority of outpatients who "felt poor" also displayed high levels of neuroticism, despite a similar level of disease activity to the rest of the sample. As a result of his findings, Gazzard et al. (1978) concluded that the most important

determinant of an IBD outpatient's prospects is not the extent or activity of their disease, but rather their personality. Vega and Rodreguez (1998) supported these results by identifying that the wellbeing of 95 CD volunteers was associated more strongly with their personal and social competence than with the symptoms of their IBD. More recently, Morino-Jiminez et al. (2007) illustrated that neuroticism (using the EPI) was negatively associated with QOL and adjustment in their sample of IBD participants (*n*=120). The present research aims to expand on these findings with the use of a matched comparison sample, and by including a number of additional personal disposition measures.

2.5.2 Internal coping and perceived control.

Apart from the numerous studies conducted in the area of personality and illness, there has also been considerable interest in the effects of coping and control as a risk factor of illness. Kobaska (1979) found that some individuals who were exposed to highly stressful events did not become ill. When investigating further, she found that these individuals differed on a number of personal dimensions, from individuals who did succumb to illness when exposed to stress. Kobaska (1979) reasoned that, stress-resistant individuals were inclined to believe more strongly that they could cope with, and exert control over the stressful events they encountered.

Coping is defined as "constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of a person" (Lazarus & Folkman, 1984). These efforts may be maladaptive

or adaptive in nature. Respectively, "defensive coping" and "constructive coping" are two such efforts. Although protecting the individual from the unpleasant emotions related to stress, "defensive coping" is an avoidance strategy which rarely provides a solution to problems. "Constructive coping" on the other hand refers to the confrontive approach made by individuals to deal with, and resolve stressful events (Weiten, 1992).

Research reviewed in Table 2.1 suggests personality has a direct positive effect on various coping styles (Nakano 1992). In particular, extraversion was found to be positively related to problem- and emotion-focused coping (McCrae & Costa, 1986; Parkes, 1986); while neuroticism and psychoticism were positively related to less effective coping strategies, such as avoidant coping (Parkes, 1986; Kardum & Krapi, 2001). In another study, Kardum and Hudek-Knezevic (1996) identified that negative mood was linked to avoidance coping; and that psychoticism related negatively to both problem- and emotion-focused coping. Furthermore, Bolger (1990) proposed that personality characteristics were the main determinants of which coping strategy an individual uses when under stress. He observed neuroticism levels, coping efforts and daily reported anxiety of 50 premedical students for 35 days surrounding a stressful medical entrance exam. It was established that neuroticism influenced poor coping efforts (wishful thinking, withdrawal, passivity, and self-blame) and increased daily reported anxiety. Moreover, these non-productive coping styles explained over half the relationship between neuroticism and increased anxiety.

Suls and Fletcher (1985) conducted a series of meta-analyses to ascertain which coping strategies were more efficacious. Avoidance coping was associated with positive adaptation in the short-term; while problem-focused coping was associated with positive

outcomes and better effects on health in the long-term. Moreover, individuals with chronic illness tend to use a combination of emotional preoccupation, instrumental, primitive denial and distraction coping strategies; while those with acute illness tend to use palliative strategies to a greater extent (Endler, Kocovski, & Macrodimitris, 2001; Rubino et al., 1999).

In general, the greatest amount of stress is experienced when individuals feel they have little or no control over a difficult situation (Cooper & Payne, 1991). When an individual feels they have control over stressful events however, they are more likely to find exposure to it far less upsetting. It has also been documented that *actual* control does not appear to be crucial; merely *perceiving* that such control exists is sufficient. A sense of personal perceived control over stressful events can therefore strongly affect an individual's reaction to such events (Scheier & Carver, 1985). In recent times, researchers have established that perceived control of internal states (such as thoughts, emotions, and physical reactions) is also of particular importance with regards to stress management and general health status. The majority of interventions utilized by clinical psychologists to help their clients manage stressful encounters involve modifying maladaptive thoughts, curbing negative emotions, and enhancing control over physical reactions. Although the occurrence of negative events cannot be controlled, the impact of such events on an individual's health and wellbeing can be lessened and they may be more apt to deal with stress, if they perceive to have the ability to exercise control over their thoughts, emotions and physical reactions (Pallant, 2000).

Locus of control (LOC) first described by Rotter (1966), refers to the generalized belief that events in life are controlled either by one's own actions and abilities (internal LOC), or by outside forces such as fate, chance and luck (external LOC).

Perceived (internal) control over events is seen to increase the ability to cope more effectively, and increases the likelihood of staying healthy when under stress (Cooper & Payne, 1991). Internal LOC is associated with a higher degree of approach-coping behaviours, it promotes action, an increased level of personal responsibility for illness (Gomez, 1997) and is linked with better adjustment and general mental health (Parkes, 1984). Parkes (1984) illustrated that female student nurses who possess high internal LOC displayed more adaptive patterns of coping than those with an external LOC. Similarly, Gomez (1997) demonstrated that adolescent coping levels were significantly higher when associated with internal LOC, compared to external LOC. External LOC has been associated with the use of maladaptive coping strategies and with increased levels of stress, depression and maladjustment (Weiten, 1992).

Self-efficacy refers to an individual's belief about their ability to exercise control over stressful events and how this self-appraised coping ability influences subsequent feelings, thoughts and actions. Self-efficacy has been shown to modulate the impact of various stressors, from experimentally induced pain to childbirth (Neufeld, 1989). High self-efficacy is therefore seen as a powerful personal resource in coping with stress. Individuals with high self-efficacy believe they can achieve their goals; trust their own capabilities to master demands; and face stressful events with confidence. Individuals with high levels of self-efficacy also tend to be healthier, more motivated and more successful than individuals with low self-efficacy. Individuals with low self-efficacy

tend to produce little initiative, are prone to self-doubts and perceived coping deficiencies and are more susceptible to depression and anxiety (Bandura, 1995).

2.5.2.1 Literature on internal coping-perceived control and IBD.

In the literature reviewed for the present study (see Table 2.1), mixed results have emerged with regards to the coping strategies of IBD participants. Some studies revealed that IBD participants utilized more ineffective coping strategies in comparison to groups of non-IBD participants (Gitlin et al., 1991; Rubino et al., 1999; van der Zaag-Loonen et al., 2004), while other studies have been unable to identify coping style differences between such groups (Calsbeek et al., 2006; Larsson et al., 2008).

Rubino et al. (1999) reported that volunteers with CD (*n*=34) possessed generally ineffective coping strategies. These volunteers resorted more often to primitive defenses, denial and isolation as a means of coping. In addition, these non-productive strategies increased significantly with the duration of their illness. Gitlin et al. (1991) revealed that IBD children (*n*=39) displayed generally less effective coping styles, when compared to a control group (*n*=43). This was noted by the family members of these volunteers and by the volunteers themselves. IBD children were also identified as using passive coping strategies when dealing with external stressors (environmental demands), but apply rigid coping behaviours when dealing with internal stressors. This was also illustrated in the study by Rubino et al. (1999) who observed that when faced with external pressures participants make little effort to initiate or sustain action; yet when dealing with internal stressors (such as their illness) they tend to repeat the same coping strategies regardless of results. In addition, Rubino et al. (1999) documented that

IBD participants resort to more primitive defences and defective mature defences than healthy controls. They are inclined to utilize strategies such as affect isolation, pathological denial, projection, reaction formation, rationalization and defences to ward off drive conflicts. More recently, in their 2004 study, van der Zaag-Loonen et al identified that 65 IBD adolescents generally utilized more avoidance coping compared to normed data.

Olbrisch and Ziegler (1982b) illustrated that IBD volunteers (*n*=143) who were less well adjusted to their condition tended to give the disease a more socially acceptable name (i.e., denial coping), and would rather leave a location than produce odours in the bathroom (i.e., escape-avoidance coping). Watson and Pennebaker (1989) emphasized that the chronic use of avoidant coping acts as a cumulative stressor, which inevitably increases the risk of disease and other psychological concerns. Kinash, Fischer, Lukie and Carr (1993) and Maunder and Esplen (1999) reported that IBD participants who used maladaptive coping strategies (such as self-blame, escape-avoidance and affect-oriented coping) were all associated with poorer satisfaction and disease related QOL. Similarly, it was demonstrated by van der Zaag-Loonen et al. (2004) that IBD adolescents who were able to apply more adaptive and less non-productive strategies possessed significantly better health-related QOL (HRQOL). The importance of coping styles and their effects on IBD adjustment has also received attention with regards to the family unit. The ability of a family to effectively cope with IBD and its treatment regimen has been suggested as being a strong contributing factor to disease course, overall illness adjustment and general wellbeing (Colcher, 1984; Engstrom, 1991a; Gloeckner, 1983). With the use of a semi-structured interview, Gerson et al. (1993) noted that families who were unable to successfully adjust tended to use ineffective

coping strategies in face of the illness. They viewed the illness as being an uncontrollable threat, used pathological denial, avoided conflict and negative emotions, responded passively to the disease and tended to have narrow social networks. On the other hand, families who successfully adapted to IBD were seen to use more effective coping. They accepted the unpredictability of the illness, openly discussed their emotions, used active problem-solving strategies and viewed the illness as an opportunity for mastery.

Despite a number of studies claiming that certain coping strategies are associated with the expression of IBD and adjustment to the condition, other literature was unable to identify between-group differences based on coping strategies. Calsbeek et al. (2006) researched the different coping strategies used by adolescents and young adults with various digestive disorders (including IBD) as well as those used by a healthy control group. Although task oriented coping was identified as the more frequently used strategy; and emotion-focused coping deemed the least used strategy; no coping differences were identified within disorder groups or between control and disorder groups. Larsson et al. (2008) also surveyed 742 IBD participants and reported that their most used coping strategies were optimistic, self-reliant and confrontive strategies. Despite the use of these more effective coping strategies, no association was found between the type of coping used and the health-related QOL of these participants. Similarly, in an earlier paper Greene et al. (1994) investigated whether the coping styles used by 11 IBD volunteers mediated the effects of stress on disease severity. Results suggested that perceived stress was significantly related to IBD severity regardless of the coping method used. As no evidence was found to support the hypothesis that coping mediates the stress-IBD activity relationship, a number of assumptions were

made. It was suggested that stress may be independent of coping mechanisms; that IBD volunteers consistently use inappropriate coping strategies; or that IBD volunteers use appropriate strategies, but with impaired execution. Further investigation into the mediating role of coping styles is warranted.

As there has been no firm consensus as to whether coping strategies predict overall health and wellbeing; some researchers have aimed to evaluate whether the perceived controllability of an event may determine the effectiveness of a coping strategy, and consequently HRQOL. It has been reasoned that when individuals *perceive* they are in control of a situation, such as their health, there is a greater chance of overcoming the uncertainty that accompanies coping with the chronic and unpredictable nature of IBD (Klonowski & Masoodi, 1999; McCloud, 2000).

Felton and Revenson (1984) investigated whether perceived control of a chronic health problem (rheumatoid arthritis, cancer, diabetes, and hypertension) mediated the relationship between coping responses and psychological adjustment. They predicted that individuals with illnesses that offer few opportunities for control (e.g., rheumatoid arthritis and cancer) would utilize different coping strategies to individuals with illnesses more responsive to efforts of control (e.g., hypertension and diabetes). Results indicated that although information seeking had salubrious effects on adjustment and wish-fulfilling fantasy had deleterious consequences; neither coping strategy was modified by illness controllability. They concluded that it is not actual controllability, but *perceived* controllability of illness that is important in illness adjustment. In support of this finding, Conway and Terry (1992) conducted a study where university students (n=101) were required to describe a stressful event and complete the Ways of Coping

Questionnaire. They demonstrated that coping strategies, in particular problem focused coping, was described as being more effective only when a stressful event was appraised as being controllable.

A number of studies investigated whether having information about IBD helped individuals to cope better with their illness. Olbrisch and Ziegler (1982b) reasoned that if individuals were involved in education and possessed IBD information; this would provide them with a sense of control over their treatment options and illness course, and help to reduce the stress experienced from a lack of understanding about what was happening to them. Their results indicated that although "information" was helpful; it was the perceived usefulness of the information, and an acquired perception of control by possession of the information that best predicted adjustment to their IBD. Gazzard (1987) also found that the ability to cope with IBD was markedly influenced by the amount of access to information an individual has about the likely physical and psychological consequences of the disease. More recently, it has been illustrated that acquiring information about IBD (Mukherjee, Sloper, & Turnbull, 2002; Olbrisch & Ziegler, 1982a) and being able to participate in the decision-making process with regards to different treatment options (Goldring, Taylor, Kemeny, & Anton, 2002) provided individuals with an increased perception of illness control and ability to cope effectively with IBD.

Engstrom (1991a) asked 20 children and adolescents with IBD to complete the Nowicki - Strickland Locus of Control scale. The results of her study suggested that IBD participants report more external LOC than matched diabetic (n=20) and healthy participants (n=20). She concluded that as the cause of IBD remains unknown, it is

difficult for these participants to experience the course of their disease as being contingent on their own behaviour. With an illness like diabetes, on the other hand, it is well known that a large degree of behavioural control is required to manage the illness. This behavioural control fosters a high level of internal LOC, and subsequently better illness adjustment (Grey et al., 1997).

A lack of internal control is related to the use of generally ineffective coping behaviours such as wishful thinking and avoidance (Gomez, 1997; Parkes, 1984). As a consequence of the use of ineffective coping strategies, poor adjustment and a decreased health related QOL often results. Hommel (2008) asserted that internal health beliefs will play a significant role in the management of IBD, by promoting not only better illness adjustment but also less IBD severity.

Of the reviewed studies investigating the influence of coping - control mechanisms on IBD outcomes; they were inclined to use only a sole measure of coping or control, and investigate effects of external control or ineffective coping strategies. Furthermore, limited research has focused on identifying the effects effective coping – control strategies have on IBD. The present study aims to enrich current literature by including a battery of both coping strategy and control mechanism measures, as well as simultaneously assessing the effects of effective/ineffective coping and internal/external control on wellbeing.

2.5.3 External coping.

While physical techniques for handling stress (e.g., exercise and good nutrition) have received much attention; strategies based on psychological or behavioural factors (e.g., relaxation training, meditation and cognitive-behavioural therapy) have gained popularity (Mussell et al., 2003; Rechschaffen, 1996). Among these latter strategies, one that has received increasing support is the development of social networks. Social support can be separated into three categories: emotional, instrumental and informational. Emotional support relates to the provision of love, trust and empathy. Examples of instrumental support are helping behaviours such as providing skills, time and state government allowances. Informational support includes the provision of advice (Seppanen, Kyngas, & Nikkonen, 1999). Other authors prefer a more simplified description of social support; referring to it as an interpersonal interaction including affection, assurance and help (Engstrom, 1991b).

Social support has been demonstrated to provide both direct and moderating effects on psychological wellbeing as a result of stressful life events (Sarason, Sarason, & Pierce, 1990; Sewitch et al., 2001; Thoits, 1995). Individuals, who obtain support and possess close ties with other people, are better able to cope with and reduce the negative effects of stress. Talking problems over seems to ease emotional tension and help to unload annoyances before they become major issues. Cohen and Wills (1985) explained more specifically that it is *perceived* social support, as opposed to merely the amount of support received that provides the stress-buffering effect. The more support an individual perceives, the less threatened they feel by a stressful situation, as they are confident of receiving help and assistance whenever it is needed. Perceived support has

been reported to protect individuals against the effects of stress by influencing the interpretation of stressors, increasing the knowledge of various coping strategies, and enhancing the individuals' self-concept (Cohen & McKay, 1984).

Many studies have also identified the benefits of social support with regards to illness recovery. Perceived social support has been illustrated to reduce mortality in cardiovascular illness (Orth-Gomer, Rosengren, & Wilhelmsen, 1999), to buffer the immunosuppressive effects of stress related disorders (Levy et al., 1990), and to be associated with a slower progression of CD4 decline in HIV patients (Tieorell et al., 1995). Kupst and Schulman (1988) and Magni, Silverstro, Tamiello, Zanesco, and Carli (1988) identified that parents who received quality support from family and other networks adjusted well to their child's cancer; while parents who received low levels of support displayed more depression and anxiety. Pedersen, Middel, and Larsen (2002) observed the role of social support in the perceived health of cardiac patients. Cardiac patients who reported less satisfaction with their support networks displayed more health complaints and experienced an increased risk of depression and anxiety.

2.5.3.1 Literature on external coping and IBD.

Table 2.1 refers to a number of research papers indicating that despite the observed positive effects of social support, IBD volunteers tend to report feelings of isolation and a decreased perception of support networks.

In an uncontrolled study, Gazzard et al. (1978) found that CD outpatients (*n*=85) who were highly neurotic felt that their relationships had deteriorated since the onset of their disease. Those who were more extroverted however, reported having improved relations with family and friends as a result of their illness. Rubino et al. (1999) uncovered that compared to controls (*n*=68), IBD participants (*n*=34) often resorted to "isolation" as a means of coping with their illness. Many individuals with IBD tended to shy away from sexual relationships, which consequently lead to problems with partners. Moreover, individuals with IBD reported feeling isolated, especially if friends, family, and co-workers did not understand, or were unsupportive of their illness (Klonowski & Masoodi, 1999). Engstrom (1999) found that significantly higher rates of family dysfunction were reported in IBD families compared to families with healthy children.

Dudley (1995) compared the psychological and symptom experience of 42 IBD outpatients in remission, to those in the active phase of their condition. She revealed that individuals who were experiencing IBD symptoms, reported lower levels of support than those in remission. In addition, she identified that the longer individuals had the disease, the less social support they reported to possess (Dudley, 1995). Maunder and Esplen (1999) uncovered that the greatest reported issue for IBD participants was a lack

of social support and isolation. It is thus apparent that for many individuals with IBD, a lack of support occurs at a time when it is most needed.

Having a diagnosis of IBD can make it difficult to initiate and develop social networks and can impact on social isolation for a number of reasons. One reason is due to the fear of unpredictable exacerbations and embarrassing symptoms, such as losing bowel control (Gerson et al., 1993; Sajadinejad, et al., 2012). This fear not only affects something as simple as shopping, but can also prevent individuals from participating in social activities or traveling (Godber, 1989; Olbrisch & Ziegler, 1982a). Another factor contributing to a sense of social isolation is that it is generally considered taboo or unacceptable to discuss the nature of the disease and its other associated and often embarrassing symptoms. Topics such as bowel motions and digestive concerns are not considered desirable topics of conversation (Olbrisch & Ziegler, 1982b).

Godber (1989) suggests that the lack of discussion about their illness is in fact the cause of many problems. An inability for IBD individuals to communicate their concerns may contribute to their feelings of having no support (Gerson et al., 1993). Such individuals can do much to help themselves once they are able to talk with others about their disease and its associated concerns (Thompson, 1993). The benefits of family, friends and other support networks in regards to these issues are obvious. A well developed and effective social network for individuals with IBD is expected to reduce some of the stressors created by having this illness, activate the use of effective coping and assist in quicker recovery from IBD exacerbations (Kiebles et al., 2010). In an uncontrolled study, Sewitch et al. (2001) surveyed 200 IBD volunteers and revealed that the relationship between perceived stress and psychological distress depended on the level

of satisfaction of social support. They concluded that a high degree of satisfaction with their social support contributes to a favourable impact on levels of distress and can improve IBD health outcomes.

Maunder (1998) found that 65% of IBD participants involved in supportive-expressive group therapy displayed a decline in maladaptive coping strategies (e.g., escape-avoidance and self-blame) and improvement in IBD related QOL. A number of papers (Godber, 1989; Hall, Rubin, Dougall, Hungin, & Neely, 2005; Olbrisch & Ziegler, 1982b) suggest that counselling, group therapy and possessing a comfortable doctor-patient relationship provide IBD participants with a therapeutic effect and improves their long-term prognosis including illness adjustment. In addition, having support of this kind alleviates their isolation and helps dampen the fears associated with this chronic condition.

2.5.4 Wellbeing.

As literature in this area demonstrates, key measures of an individual's wellbeing encompass good physical health and a lack of symptoms of stress and depression (Brantley & Glenn, 1993; Gerson et al., 1993; Gwee et al., 1999; Mayer, 2000; Vega & Rodriguez, 1998). The factors relating to wellbeing that are explored within the present research paper include: general health, depression, perceived stress and a measure of adjustment specifically related to IBD volunteers.

An enormous amount of research exists in the health literature with regards to depression and its links to stress. It is well established that stressors such as employment (Wang & Patten, 2001), school performance (Hilsman & Garber, 1995) and marital dissatisfaction (Whisman, 1999) contribute to developing symptoms of depression. Furthermore, if an individual is under continuous stress, such as that of chronic illness, a single difficult event is likely to induce a depressive episode (Sherrill et al., 1997).

Research has also established a negative and reciprocal effect of stress on depression. Hammen (1991) studied women with various forms of depression and compared them to women with no depressive disorder. She found evidence that the depressed womens' symptoms, behaviours, characteristics and social context generated stress which, in turn, contributed to their depression. Pianta and Egeland (1994) studied the reciprocality of stressful events and depression over a one year period of time. They found that health-related stress, family violence, and financial stress related to increased depression, which subsequently exacerbated not only their original stressors but also induced additional stress. This finding was supported by Davila, Bradbury, Cohan, and Tochluk (1997) who assessed newlywed couples on depressive symptoms, marital stress, support perceptions, and support behaviour. Their results indicated that depressive symptoms increased marital stress and decreased social support which, in turn, increased the experience of general stress.

Depressed individuals compared to non-depressed individuals are observed to encounter more stress, and possess fewer personal resources needed to moderate its impact (Kovacs & Kovacs, 2007). Depressed individuals often have negative beliefs about their ability to cope based on perceived failures in the past. This "learned helplessness" is

seen to develop into feelings of stress and anxiety. McCrae and Costa (1986) claim that the use of effective coping strategies is strongly linked to reports of subsequent happiness and life satisfaction; and that personality type was illustrated to increase the strength of this relationship between coping and wellbeing.

Research has also linked coping strategies, perceptions of control and perceived stress to illness adjustment. Using the Psychological adjustment to illness Scale, Helgeson (1992) revealed that personal feelings of control over illness were associated with better psychosocial illness adjustment. Grey et al. (1997) assessed the adjustment of diabetic outpatients and illustrated that poor illness adjustment was associated with greater use of avoidance coping, wishful thinking and worse self-care. Overall better adjustment was related to the coping behaviours of humour, venting feelings and social support. McLean, Harvey, Pallant, Bartlett, and Mutimer (2004) examined the power of selected risk and resistance measures in predicting mothers' adjustment to caring for children with chronic illness. These investigators explicitly assumed that chronic illness - in this case indirectly experienced - represents an added source of life stress and, in consequence, negatively influences adjustment. McLean and colleagues reported that, collectively, their resistance factors of optimism, perceived control of internal states, social support and family functioning directly affected mothers' adjustment scores. Of even greater interest was the fact that their analyses identified optimism as a moderator of this relationship.

2.5.4.1 Literature on wellbeing and IBD.

Physiological measures of IBD activity such as stool frequency, weight loss, and nutritional parameters, provide valuable information to surgeons and physicians. Nevertheless, these measures provide no correlation with functional capacity and wellbeing, which are reported to be the most valued areas for IBD participants (Thirlby et al., 1998). Family members and physicians are inclined to underestimate the level of dysfunction created by having this chronic illness, compared with IBD participants themselves (Borgaonkar & Irvine, 2000). Of the relevant literature reviewed, the most common measures used to determine the overall wellbeing for IBD participants are depression; HRQOL and IBD-specific adjustment (see Table 2.1).

Research has illustrated that IBD flare-ups tend to occur at times of increased emotional and physical stress (Duffy et al., 1991; Fava & Pavan, 1976; Greene et al., 1994; Lewis, 1988; Robertson et al., 1989). Although there is no conclusive evidence that poor wellbeing will trigger an IBD flare; it is widely accepted that experiencing stress and depression for extended periods can affect the gastrointestinal tract, which may induce flare-ups in those biologically susceptible individuals (Olbrisch & Ziegler, 1982; Thompson, 1993).

Individuals with IBD demonstrate an increased risk for psychological maladjustment and disorders such as depression and anxiety, when compared to healthy controls (Drossman & Ringel, 2003; Engstrom, 1991; Kovacs & Kovacs, 2007; Kurina et al., 2001; Mackner & Crandall, 2006; Mackner et al., 2006). Robertson et al. (1989) and Todarello et al. (2004) further identified that individuals with IBD displayed higher

levels of depression during active disease, but that depression was less common in established IBD. Studies have also documented that IBD respondents, compared to healthy controls, report impaired HRQOL in the areas of physical, social and emotional functioning (Larsson et al., 2008). The impairment of psychological and social QOL is generally greater than the impairment of physical QOL in IBD volunteers (Drossman & Ringel, 2003). Guthrie et al. (2002), after surveying 116 IBD outpatients, revealed that depression was associated with poorer HRQOL regardless of illness severity. More recently in their uncontrolled study using 120 IBD volunteers, Morino-Jimenez et al. (2007) showed that self-esteem was significantly associated with increased HRQOL; while neuroticism and a difficulty in describing feelings was associated with decreased HRQOL.

Several reports have suggested significant negative associations between HRQOL and IBD symptoms / severity (Casellas et al., 2000; Cunningham, Drotar, Palermo, McGowan, & Arendt, 2007; Larsson et al., 2008; Sajadinejad, et al., 2012; Thirlby et al,. 1998; van der Zaag-Loonen et al., 2004). In contrast, Turnbull and Vallis (1995) were only able to demonstrate IBD activity as a predictor of decreased QOL, when it was combined with poor coping and psychosocial distress.

Additional factors related to IBD adjustment and HRQOL include illness type and gender. CD is consistently associated with a poorer HRQOL than UC (Borgaonkar & Irvine, 2000; Larsson et al., 2008) and female IBD participants are documented as reporting worse HRQOL than their male counterparts (van der Zaag-Loonen et al., 2004). Thirlby and colleagues (1998) assessed the health related QOL of CD (*n*=36) and UC (*n*=27) participants requiring surgery. Using the Health Status Questionnaire, IBD

participants assessed post surgery were found to have significantly improved - to levels comparable with norms - on measures of QOL. In contrast, Caselleas and colleagues (2000) controlled, self-report study, disagreed that surgery improved HRQOL. They assessed 119 CD participants (48 inactive and non-operated, 29 inactive and operated, and 42 with active disease) on the Psychological General Wellbeing Index and EuroQOL. Their results revealed that HRQOL is impaired during active disease, but improves during remission; whether achieved medically or surgically. Goldring et al. (2002) surveyed 218 IBD volunteers with active disease and found that shared-decision making with their physician was positively associated with IBD-specific and general QOL, and threat of disease was negatively associated with these measures.

Although the life style changes accompanied by IBD are often characterized in terms of loss and negative modifications (Hommel, 2008), some individuals are able to identify several positive changes associated with their illness. Such positive alterations include a re-evaluation of life priorities; an opportunity to reflect upon one's sense of identity; the development of personal strength and courage; and a deepening of interpersonal relationships and faith (Maunder & Esplen, 1999). Furthermore, individuals who can view their illness in a positive manner, who have higher self-esteem and social competence and who view themselves as being "different" rather than "sick" tend to adjust to their illness more successfully (Olbrisch & Ziegler, 1982b). When predictors of both concurrent and later IBD adjustment can be established, this will have implications for the management of this illness group. The identification of vulnerable IBD participants (based on personal dispositions and coping behaviours) can then be subjected to interventions with the aim of improving these domains, so as to reduce the potential for later illness maladjustment.

2.6 Summary of Relevant Literature

Inflammatory bowel disease (IBD) is a term referring to two related diseases of the gastrointestinal tract, Crohn's disease (CD) and ulcerative colitis (UC). Individuals with IBD are confronted with a number of stressors associated with their illness. Physical stressors include severe abdominal pain, frequent (often bloody) diarrhoea and general malaise. Other psychosocial stressors include dependence on medication, regular medical investigations and the fear of potential surgery. Moreover, due to the unpredictable nature and course of this disease, individuals with IBD often report increased levels of stress, depression and health complaints (Olbrisch & Ziegler, 1982a; Olbrisch & Ziegler, 1982b; van der Zaag-Loonen et al., 2004).

As documented from the reviewed literature (see also Table 2.1) research suggests that IBD participants score high on measures of neuroticism and external control mechanisms (i.e., LOC), possess non-productive coping strategies (i.e., avoidance and passive coping), report low levels of external support (i.e., social support and family cohesion), and demonstrate symptoms of depression, perceived stress and general poor health (Engstrom, 1991; Gazzard et al., 1978; Gitlin, 1991; Holzer, 2000; Porcelli et al., 1999; Robertson et al., 1989; Rubino et al, 1999; Shabsin & Whitehead, 1991; Sheffield & Carney, 1976, Todarello et al., 2004).

Although an extensive body of literature exists examiming relations between stress, personality, coping and illness adjustment (i.e., Brantley & Jones, 1993; Grey &

Thurber, 1991; Grey et al., 1997; Gwee et al, 1999; Pollock, 1986; Selye, 1976; Shabsin & Whitehead, 1991), only a small body of work examines the proposed link between these factors for volunteers with IBD. Furthermore, a majority of this research focuses on negative personal dispositions and ineffective coping mechanisms as predictors of adjustment (Duffy et al., 1992; Garrett et al., 1991; Gitlin, 1991; Greene et al., 1994; Mayer, 2000). Limited research includes both positive dispositions and effective coping strategies as variables that may influence wellbeing and IBD adjustment (Borgaonkar & Irvine, 2000; Colcher, 1984; Gazzard et al., 1978; Gerson et al, 1993). The present research aims to add to this body of work by simultaneously including measures of both positive and negative dispositions (i.e., extraversion and neuroticism; positive and negative affect) as well as effective and ineffective coping mechanisms (i.e., active and non-productive coping).

It must also be noted that none of the research reviewed has simultaneously or systematically examined the effects of IBD type (CD vs. UC) and IBD severity (mild vs. severe) on wellbeing / adjustment. Furthermore, an overwhelming proportion of these papers used a sole measure of wellbeing /adjustment to test their predictions. The present study examines differences between IBD type and severity, and incorporates a collection of wellbeing measures (perceived stress, depression, health complaints, and IBD specific adjustment) as the outcome component of this studies framework.

Although it is generally accepted that individuals with chronic illness are at a greater risk of decreased wellbeing / adjustment than individuals without chronic illness; research has shown that the degree of wellbeing varies considerably within illness groups, suggesting factors other than the condition itself are responsible for overall

degree of wellbeing (Grey & Thurber, 1991; Grey et al., 1997, Pollock, 1986). Despite making such claims, all the reviewed research presented within Table 2.1 is atheroretical and failed to include a conceptual framework to outline possible interactions between stress and wellbeing/adjustment. The current research attempts to contribute to the understanding of all factors associated with wellbeing and adjustment by the development of the framework of "Adjustment to Chronic illness". Interrelations between personal dispositions, coping - control mechanisms and wellbeing may also be clarified by the use of this study's framework (see Chapter 3 for a more detailed description of the framework). Furthermore, this framework can be incorporated into, and tested by future research in order to identify factors associated with wellbeing; and develop appropriate interventions to facilitate successful adjustment by those faced with life stressors, in particular IBD.

2.6.1 Aims and Hypotheses.

The present study was designed with the aim of identifying differences between individuals with and without IBD. This research further investigated the interrelations between personal dispositions, coping – control mechanisms and wellbeing for both comparison groups; and aimed to discover the strongest predictors of wellbeing.

Based on the summary of relevant literature from 1970 to 2008 (see Table 2.1), the following predictions were generated.

2.6.1.1 Hypothesis 1.

Numerous research papers have established that life stress contributes to decreased wellbeing (Engstrom, 1991; Kovacs & Kovacs, 2007; Mackner & Crandall, 2006; Sharpley, 1994; Sheffield & Carney, 1976). An important logical assumption of the framework of this study is that life stressors are common to both IBD and non-IBD groups. Life stressors have however been manipulated within this research design as chronic illness (IBD) represents an identifiable added source of stress for the IBD group. It was assumed therefore that any identifiable differences between the two comparison groups will be linked to the fact that the IBD group has this added source of stress. It was predicted that the IBD group in comparison to the non-IBD group will report higher mean scores on the three common measures of wellbeing: General health concerns, Perceived stress and Depression.

2.6.1.2 Hypothesis 2.

Personality, in particular neuroticism, has been linked to somatic complaints and illness (Grossarth-Maticek & Eysenck, 1991). A number of studies have also linked neuroticism with IBD (Gazzard et al., 1978; Robertson et al., 1989; Shefield & Carney, 1976). As a consequence some researchers have discussed the possibility of a disease-prone personality for IBD. Robertson et al. (1989) predicted that IBD was more likely to develop in individuals with a predisposed personality. In their study they found that neuroticism scores were more prevalent in IBD participants than in a control group. Furthermore, increased neuroticism was found in both established cases of IBD and in

those prior to an IBD diagnosis. It was concluded that the personality disposition, neuroticism, is not simply the result of having this chronic condition, but is part of the premorbid personality. Based on the findings of Robertson et al. (1989), it was predicted that the IBD group would score significantly higher on neuroticsm than the non-IBD group.

2.6.1.3 Hypothesis 3.

Research has reported that as factors contributing to IBD relapse remain uncertain, it is difficult for the individual to experience the disease course as being contingent on their own behaviour. Engstrom (1991) indicated that IBD volunteers display higher levels of external LOC compared to a control group. IBD volunteers are also reported to possess ineffective coping strategies when dealing with stress (van der Zaag-Loonen, 2004). Maunder and Esplen (1999) uncovered that the greatest issue for IBD participants was a lack of social support and isolation. Engstrom (1999) identified significantly higher rates of family dysfunction in IBD families compared to those with healthy children. Based on these findings, it was predicted that IBD participants compared to their non-IBD counterparts would report significantly poorer scores on internal coping-control measures (increased non-productive coping; increased chance and powerful others health LOC; decreased internal health LOC; decreased PCOISS; decreased self-efficacy) and poorer scores on external coping measures (decreased social support and family harmony).

2.6.1.4 Hypothesis 4.

As personal dispositions measure stable constructs of individual differences, it was predicted that they would provide a stronger influence on wellbeing measures than the more transitory coping-control variables. In addition, following the results of Moreno-Jimenez et al. (2007) it was predicted that the personal dispositions of neuroticism and self-esteem would be significant predictors of wellbeing, with neuroticism being the stronger predictor.

2.6.1.5 Exploratory research question.

Coping – control variables have been implicated as potentially adding to the prediction of wellbeing, over and above that of personal dispositions. This research question explored whether coping – control variables provide any 'added value' in predicting wellbeing beyond that accounted for by the included personal dispositions alone. This is important for remediation purposes as coping – control variables can be modified, while the dispositional factors are regarded as relatively immutable.

Based on literature in the field of IBD a number of minor predictions were also generated.

2.6.1.6 Minor Prediction 1.

Approximately 75% of individuals with CD require surgery at some point during the course of their illness, while only 40% of UC individuals require this course of action (Langholtz et al., 1997). Schwarz (1989) reported that CD participants displayed increased anxiety, psychological distress and symptom severity than participants with UC. Futhermore, Casellas and colleagues (2000) identified that active CD impairs volunteers HRQOL significantly more than active UC. It was predicted that participants with CD, compared to UC, would report higher mean scores on the wellbeing measures of general health complaints, perceived stress and depression as well as lower IBD Adjustment scores.

2.6.1.7 Minor Prediction 2.

Many reports have suggested significant associations between poor wellbeing and increased IBD severity (Casellas et al., 2000; Cunningham et al., 2007; Guthrie et al., 2002; Larsson et al., 2008; Thirlby et al., 1998; van der Zaag-Loonen et al., 2004). Other reports in the literature could not identify an association between severity and adjustment/wellbeing (Gazzard et al., 1978; Turnbull & Vallis, 1995). Turnbull and Vallis (1995) reported that when IBD activity was experienced together with poor coping and psychosocial distress, this combination of factors predicted poor wellbeing. It was predicted that IBD participants classed as more severe, compared to those with mild IBD, would score higher on the wellbeing measures of general health complaints, perceived stress and depression as well as lower IBD Adjustment scores.

2.6.1.8 Minor Prediction 3.

With the use of a questionnaire, Morris et al. (2001) established that the rates of IBD were twice as high in left-handers than in right-handers. This study predicted that there would be an increased proportion of left-handed IBD participants, compared to left-handed non-IBD participants.

2.7 Chapter Summary

This chapter discussed the condition of IBD, including possible aetiology, symptoms, treatment and psychological correlates. This chapter then reviewed recent literature related to coping with chronic medical issues, in particular inflammatory bowel disease (IBD). A total of 64 studies were identified (see Table 2.1). From these studies, selected reports that were most relevant to the present study were discussed in more detail. The chapter concluded with a synopsis of testable hypotheses and predictions based on this review.

Chapter 3: Method

3.1 Chapter Overview

This chapter includes a description of the recruitment process and design of the study. The conceptual framework utilised is also outlined. This framework was developed specifically for this dissertation and provides not only the theoretical rationale for conducting the study, but also the basis for associated predictions. The measures used to operationalise the framework are explicated in both narrative and diagrammatic form. The chapter concludes with a description of the statistical analyses used to test the major predictions of this research project. While participant characteristics are usually included in the method section, since detailed analysis of the sample was required in order to create the subsamples compared, it was decided to include this in the results section.

3.2 Recruitment Process and Procedure

Various Hospitals and Medical Specialist Centres (i.e., Cabrini Hospital, Box Hill Hospital, The Royal Melbourne Hospital, St. Vincent's Hospital, The East Melbourne Specialist Center and The Dandenong Gastrointestinal Clinic) were contacted by phone, requesting voluntary participation of their IBD participants within the present study. Following this initial communication, a letter explaining the purpose and requirements of the research was mailed out to all interested institutions (see Appendix A). Once involvement within the study was agreed upon, the participating hospitals distributed a

questionnaire to each willing participant. A total of 210 questionnaires were distributed to participants with an IBD diagnosis. For each IBD respondent, a comparison respondent was recruited by matching them on age and gender, with the only stipulation being that they had not experienced a chronic illness. A comparison group was conveniently recruited by enlisting the help of colleagues. Matched-participant designs assist in minimising differences between groups so that participant variables that are not the focus of the study (which in this instance was age and gender) may be controlled for (Gravetter & Forzano, 2012). A total of 120 questionnaires were distributed to individuals without IBD. Participants completed the questionnaire booklet at a time and place of their convenience, which they returned by reply paid envelopes to Monash University. Participants were given the option to answer only those questions that they wanted to, and were informed that they could withdraw from the study at any time. The questionnaire booklet took approximately 40 minutes to complete. A total of 182 questionnaires were returned; 95 from participants with IBD and 87 from participants without IBD. This signified a total response rate of 55% (45% response rate for participants with IBD; and 73% response rate for participants without IBD). As Fincham (2008) regarded a survey response rate approximating 60% to be the goal of researchers, this study's response rate of 55% was deemed satisfactory. Data collection occurred over eight months.

3.3 Study Design

Figure 3.1 illustrates an overview of the design of the study, depicting how the comparison groups were established. The sample of convenience comprised 95 participants diagnosed with IBD and 87 non-IBD participants matched for age and

gender. The IBD participant group was further split based on illness type (CD vs. UC) and severity (mild vs. severe). Detailed information regarding the demographic characteristics and subsample size of each comparison group is provided in Chapter 4 (Results).

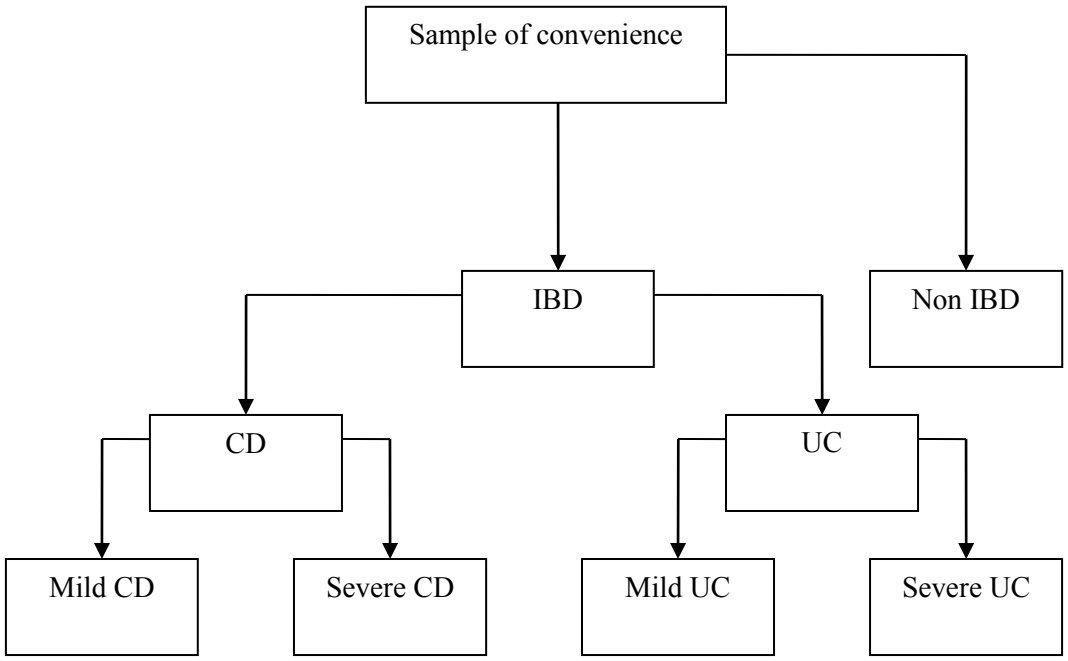


Figure 3.1. Overview of the design of the study.

Employing a carefully matched comparison group that consisted of participants without illness was intended to address a major limitation of the extant research investigating the predictors of wellbeing. That is, the previous research (as was outlined in detail in Chapter 2) invariably did not employ a matched comparison group. Consequently, inappropriate, or at least questionable inferences have been made to the IBD population. Additional strengths of the current study's design in comparison to past research are the recruitment of a larger sample size than previous research, as well as employing multiple outcome measures. In addition, the present study, used a carefully planned set of comparisons in conjunction with a theoretical rationale.

3.4 Measures

A booklet containing various questionnaires was supplied to each participant. A copy of the survey questionnaire is presented in Appendix B. The following list summarises the self-report measures used in the current study, grouped under the headings: personal dispositions, internal coping-control, external coping, and wellbeing domains.

Personal dispositions

- Positive and Negative Affect Scale [PANAS] (Watson, Clark, & Telligen, 1988)
- Eysenck's Personality Inventory [EPI] (Eysenck & Eysenck, 1964)
- Life Orientation Test (Revised) [LOT-R] (Scheier, Carver, & Bridges, 1994)
- Rosenberg Self-Esteem Scale [RSE] (Rosenberg, 1965)

Internal Coping mechanisms – Control Orientations

- Multidimensional Health Locus of Control Scale [MHLC] (Wallston et al., 1978)
- Coping Scale for Adults [CSA] (Frydenberg & Lewis, 1997)
- Perceived Control of Internal States Scale [PCOISS] (Pallant, 2000)
- Generalised Self-Efficacy Scale [GSES] (Schwarzer & Jerusalem, 1993)
- Courtauld Emotional Control Scale [CECS] (Watson & Greer, 1983)

External Coping facilitators

- Dukes Social Support Questionnaire [DSS] (Goodger et al., 1999)

- Scale of Family Atmosphere [SOFA] (Molloy & Pallant, 2002)

Wellbeing

- General Health Questionnaire [GHQ-12] (Goldberg, 1992)
- Perceived Stress Scale [PSS-10] (Cohen, Kamarck, & Mermelstein, 1983)
- Beck Depression Inventory-II [BDI] (Beck, 1996)
- Experience related to IBD Scale [IBD Adjustment] (Olbrisch & Ziegler, 1982b)

Descriptions and psychometric properties of each of the measures included in the questionnaire booklet are presented subsequently, followed by a description of how these measures relate to the conceptual framework of "Adjustment to Chronic Illness".

3.4.1 Personal dispositions.

3.4.1.1 Positive and Negative Affect Schedule (PANAS).

The PANAS was developed by Watson et al. (1988). It can be used to assess either trait or state dimensions of Positive Affect (PA) and Negative Affect (NA) by varying the time instructions, from 'present moment' to 'the past year' or generally. The scale is self-administered and consists of 20 adjectives which describe different emotions and feelings (10 describe negative moods while 10 describe positive moods).

Examples of NA moods are:

4. upset
14. nervous
20. afraid

Examples of PA moods are:

5. strong

9. enthusiastic

19. active

For each item participants were asked to indicate on a 5-point Likert scale the extent to which they felt this way during *the past few weeks*. This time dimension was chosen so as to measure trait dimensions of the PA and NA constructs rather than state dimensions. The points on the scale were labeled *very slightly or not at all (1), a little (2), moderately (3), quite a bit (4)* and *extremely (5)*. High scores on each subscale indicate a high level of NA or PA.

Items for the PANAS were selected from an original set of 60 mood descriptors using factor analysis. Items for the two subscales were selected on the basis of evidencing high loadings on one factor with concurrent low loadings on the other factor (Watson et al., 1988). This scale has been tested on large samples of college students for each of the six instructional time frames (Moment, n = 660, Today, n = 657, Past few days, n = 1002, Past few weeks, n = 586, Year, n = 649, and General, n =663), with internal consistency for both subscales in all of the time frames being found to always exceed .84 (Watson et al., 1988). The discriminant validity of the two subscales has been demonstrated by Watson et al. (1988) (r = -.09, p>.05) and confirmed using exploratory factor analyses. Melvin and Molloy (2000) and Molloy, Pallant, and Kantas (2001) examined psychometric characteristics of the schedule in a sample of 670 Australian adolescents and adults. Their results were consistent with the PANAS' previously reported psychometric properties, thus confirming its suitability for use across varying ages and nationalities. Further validity of the PANAS is indicated via moderate positive

correlations of NA, and small negative correlations of PA, with the Hopkins Symptom Checklist (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974), the Beck Depression Inventory (Beck Ward, Mendelson, Mock, & Erbaugh, 1961) and the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970). Mean scores on the PA and NA subscales of the PANAS for 586 college students using the time frame of *the past few weeks*, were 32.0 (*SD* = 7.0) and 19.5 (*SD* = 7.0) respectively (Watson et al., 1988).

3.4.1.2 Eysenck Personality Inventory (EPI).

The EPI was developed by Eysenck and Eysenck (1964) as a measure of two dimensions of personality: Extraversion-Introversion and Neuroticism (stability-instability). The current study utilised both subscales of the EPI so as to identify the extent of Neuroticism (N) and Extraversion (E) displayed by each participant. Both the N and E scales consist of 24 statements.

Examples of items in the Neuroticism subscale are:

3. Do you sometimes sulk?

15. Do you sometimes get so restless that you cannot sit long in a chair?

21. Do you worry too long after an embarrassing experience?

Examples of items in the Extraversion subscale are:

4. Do you like mixing with people?

8. Do you like practical jokes?

13. Do you sometimes say the first thing that comes into your head?

Participants were asked to indicate on a 4-point Likert scale the extent to which they agreed or disagreed with the statements displayed. The points on the scale were labeled

strongly disagree (1), disagree (2), agree (3), and *strongly agree (4)*. High scores on each subscale indicate a high level of N or E.

The internal consistency of the EPI (E and N items combined) ranged from .85 to .95. For a group of "normal" (i.e., not neurotic or psychotic) subjects (N=1655), the internal consistency was .81 for N and .76 for E. The test-retest reliability over a one year time frame was studied on two groups of normal subjects. N had reliabilities of .84 and .92, while E had reliabilities of .88 and .94 for the two groups. Validity has been demonstrated using the method of nominated groups in that when independent judges were asked to nominate extraverted and introverted or stable and unstable subjects, their results matched the results of these subjects EPI results. That is, individuals who impress others as showing introverted or extraverted behaviour patterns, or as being neurotic in their everyday behaviour, answer the EPI in a corresponding manner (Eysenck & Eysenck, 1964). The mean scores of E across a range of normal groups ranged from 23.90 (*SD* = 8.30) (for Clerks) to 29.29 (*SD* = 7.41) (for Apprentices), while the mean scores of N ranged from 16.30 (*SD* = 8.93) (for Managerial) to 22.71 (*SD* = 7.66) (Skilled working class) (Eysenck & Eysenck, 1964).

3.4.1.3 Life Orientation Test (Revised) (LOT-R).

Scheier and Carver (1985) argue that the apparent links between hostility and health on the one hand, and hardiness and health on the other, can be more fruitfully interpreted in terms of Dispositional Optimism, a habitual style of anticipating favourable outcomes. The LOT (Revised) (Scheier, Carver, & Bridges, 1994) was designed to measure the degree of dispositional optimism possessed by individuals. The complete version of the

LOT contains 12 items; however due to the need to keep the questionnaire succinct, the present study used the shortened scale which consists of six statements.

Examples of statements are:

1. In uncertain times I usually expect the best

4. I hardly ever expect things to go my way (reverse scored)

5. Overall I expect more good things to happen to me than bad

Participants were asked to indicate on a 5-point Likert scale the degree to which they agree or disagree with the statements displayed. The points on the scale are labeled from *I agree a lot (1)* to *I disagree a lot (5)*. Items 1, 3 and 5 relate to optimism, while items 2, 4 and 6 are reverse scored and relate to pessimism. High scores on this test indicate high levels of optimism.

The internal consistency of the LOT has been found to be satisfactory with a Cronbach's alpha of .76. The test-retest reliability, also satisfactory, has been reported at .79 over a four week interval and .72 over a 13 week interval. The construct validity of the LOT is indicated via positive correlations with self-esteem and internal control beliefs, and negative correlations with depression, perceived stress, hopelessness and alienation (Scheier & Carver, 1985; Scheier, Carver & Bridges, 1994). The mean scores on the LOT for 357 undergraduate men was 21.03 (*SD* = 4.56), and for 267 undergraduate women was 21.41 (*SD* = 5.22) (Scheier & Carver, 1985).

3.4.1.4 Rosenberg Self-Esteem (RSE) Scale.

The RSE Scale is the most widely used measure of self-esteem in social science research (Rosenberg, 1989). Rosenberg originally developed this scale in 1965 through

working with adolescents, with it being reprinted in 1989. Self-Esteem is typically seen as a personal resource that may moderate the effects of threatening events or conditions (Abel, 1996). The RSE Scale contains 10 items.

Examples of the items include:

2. At times I think I am no good at all (reverse scored)

5. I feel I do not have much to be proud of (reverse scored)

10. I take a positive attitude towards myself

Participants were asked to indicate on a 4-point Likert scale the degree to which they agreed or disagreed with each statement. The points on the scale are labeled from s*trongly agree (1)* to s*trongly disagree (4)*. Items 1, 3, 4, 7, and 10 relate to positive self-esteem, while items 2, 5, 6, 8 and 9 are reverse scored and relate to negative self-esteem. Low scores on this test indicate high self-esteem.

This scale shows good levels of internal consistency over two administrations of the scale to 65 university students. The Cronbach's alpha for both administrations were .85 and .88 respectively. The test-retest reliability, after a four week interval, showed a high correlation of .84. The construct validity of the RSE is indicated via positive correlations with five dimensions of self-concept (r = .28 to .50, $p<.01$) indicating self-esteem is an evaluative conceptual level of self-concept (Martin-Albo, Nunez, Navarro & Grijalvo, 2007). The mean scores on the RSE for men (n = 949) and women (n = 1,345) aged between 18 and 65 was 35.01 (SD = 4.78) and 34.52 (SD = 4.91) respectively (Rosenberg, 1989).

3.4.2 Internal coping – Control orientations.

3.4.2.1 Multidimensional Health Locus of Control Scale (MHLC).

The MHLC Scale by Wallston et al. (1978) provides measures of three dimensions of health locus of control: internality, chance, and powerful others. The internality dimension measures the extent to which an individual believes the locus of control for their health is due to one's own actions and abilities. The chance dimension measures the extent to which an individual believes chance or external factors (e.g., bad luck or genetic influences) determine one's health outcomes. The powerful others dimension measures the belief in the control over an individual's health by powerful others (e.g., health professionals). The questionnaire is of a self-report format containing 18 items, with six items for each dimension.

Examples of items are:

6. I am in control of my health (internality)

15. No matter what I do, I am likely to get sick (chance)

10. Health professionals control my health (powerful others)

Participants were asked to answer the questions by rating on a 6-point Likert-type scale the extent of their agreement or disagreement with each statement. The points on the scale were labeled from *strongly disagree (1) to strongly agree (6)*.Three separate scores are obtained by adding the scores on the six items in each subscale. The higher the score on each subscale, the stronger an individual believes in each dimension of control.

Two equivalent versions of the scale were developed in order to be able to provide repeated measures of these beliefs. The Cronbach's alpha reliabilities for each of these

scales ranged from .67 to .77. An intercorrelation matrix of the scaled scores revealed that while internality and powerful others scales were statistically independent (r = .12, p>.05), internality and chance scales were negatively correlated (r = -.29, p<.01), and powerful others and chance were positively correlated (r = .20, p<.05). However, the significant correlations were small enough to indicate the discriminate validity of the three subscales. The predictive validity of the subscales was provided by computing correlations between the MHLC subscales and a two item health status measure: "At the moment I am in excellent health" and "In general, I am an extremely healthy person". Health status was seen to be positively correlated to the internality scale (r = .40, p<.001), negatively to the chance scale (r = -.28, p<.01), and unrelated to the powerful others scale (r = -.06, p>.05) (Wallston, Wallston & DeVellis, 1978). Despite the powerful others scale not demonstrating predictive validity with health status; it remained within the questionnaire of the present research so as not to alter the original scale. Construct validity was measured by examining intercorrelations between the MHLC subscales and the appropriate scales of the Multidimensional Locus of Control Scale (Levenson, 1973). Consistent correlations were found between the MHLC scales and their theoretical counter parts in Levenson's scale.

3.4.2.2 Coping Scale for Adults (CSA).

The CSA was developed by Frydenberg and Lewis (1997) to measure specific coping strategies and general coping styles used by adults. It contains items describing 19 distinct coping strategies. Exploratory factor analysis was conducted on the scale and four dimensions of coping evolved. These were: Active, Non-productive, Optimism,

and Sharing. The long form contains between three to seven items representing each of the 19 coping strategies, resulting in 73 items in total. The short form contains 19 coping strategies, with between four and seven strategies representing each one of the four coping styles. The short form was used within this research.

Examples of the strategies include:

I cope with my concern by

8. Developing a plan of action (Active coping style)

13. Daydreaming about how things will turn out well (Optimism coping style)

14. Blaming myself (Non-productive coping style)

17. Asking a professional person for help (Sharing coping style)

Participants were asked to indicate on a 5-point Likert scale the extent to which they used each form of coping strategy displayed. The points on the scale were labeled from *Doesn't apply or don't do it (1)* to *Used a great deal (5)*. High scores on each subscale indicate a high level of use of that coping strategy.

The CSA was developed as an adaptation of the Adolescent Coping Scale (ACS) due to the need for an adult specific coping scale. To examine the statistical properties of the long scale it was administered to 371 adults in Victoria, Australia. High internal consistency reliability coefficients were computed for the measurement of these 19 coping strategies, with Cronbach's alpha coefficients ranging from .69 to .92. Test-retest reliability correlations, over a 10 – 14 day interval on 25 adults, were computed to test the reliability of the 19 different coping strategies. The coefficients for all coping strategies were generally high (r = .75 to r = .97); apart from three strategies that were considered low – moderate (r = .23, .56 and .56). The authors attribute these lower values to the restriction in range of responses, rather than instability (Frydenberg &

Lewis, 1997). The short form of the CSA was used within this research due to the overall length of the questionnaire. The short form displayed acceptable internal consistency reliabilities in the current study (i.e., alpha > .70) for the dimensions of Active coping and Non-productive coping; however, due to very low reliabilities of the Sharing and Optimism coping scales (alpha < .50), these scales were not included in the final analyses of this research. The validity of the items within the short form of the CSA was measured by correlating each item with the scale to which it belonged. Correlations were all acceptable (r > .73), with a mean value of .84 (Gibson, 2001).

3.4.2.3 Perceived Control of Internal States Scale (PCOISS).

The PCOIS is an 18-item scale developed by Pallant (2000) to provide a measure of the degree to which individuals feel they are in control of their internal states (i.e., thoughts, emotions and physical reactions).

Examples items include:

3. My feelings are usually fairly stable

10. I am usually able to keep my thoughts under control

17. I have a number of ways of relaxing that I am confident will help me cope

Participants were asked to rate on a 5-point Likert-type scale the extent to which they agreed or disagreed with the statements provided. The points on the scale were labeled from *Strongly disagree (1)* to *Strongly agree (5)*, with items 1, 2, 7, 11, 15 and 16 being reverse scored. High scores on this scale indicate higher levels of perceived control of internal states.

Preliminary support for both the reliability and validity of the PCOISS was provided through two studies conducted by Pallant (2000). Internal consistency of this scale was reported as extremely high, with a Cronbach's alpha of 0.92. Though the PCOISS correlated significantly and positively with the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960) (r = 0.28, p<0.01), the modest size of this correlation indicates that scores on the PCOISS are not unduly influenced by Social Desirability, a factor well known to contribute irrelevant variance to the measurement of constructs (Pallant, 2000). Evidence in support of the construct validity of the PCOISS was provided by significant correlations with existing measures of control perceptions and psychological adjustment: Self-Control Schedule (r = .60, p<.001), Internal-External Locus of Control Scale (r = .38, p<.001), Mastery Scale (r = .52, p<.001), Generalized Self-Efficacy Scale (r = .54, p<.001), Zung Anxiety Scale (r = -.57, p<.001), Zung Depression Scale (r = -.69, p<.001), Positive Affect (r = .55, p<.001), Negative Affect (r = -.57, p<.001), General Health Questionnaire (r = -.48, p<.001), Perceived Stress Scale (r = -.58, p<.001), and Physical Symptom Checklist (r = -.46, p<.001). The mean value of this scale for 439 students enrolled at Monash University, Melbourne was 60.6 (*SD*=12).

3.4.2.4 Generalised Self-Efficacy Scale (GSES).

The GSES (Schwarzer & Jerusalem, 1995) is used to assess the strength of an individual's belief in their own ability to respond to and control novel or difficult situations, and to deal with any associated obstacles or setbacks. The scale consists of 10 statements.

Examples of the statements include:

1. I can always manage to solve difficult problems if I try hard enough.

4. I am confident that I could deal efficiently with unexpected events.

10. No matter what comes my way, I'm usually able to handle it.

Participants were asked to indicate on a 4-point Likert scale the extent to which they agreed or disagreed with the statements displayed. The points on the scale were labeled from *strongly agree (1)* to *strongly disagree (4)*. Low scores on these items indicate high self-efficacy, while high scores indicate low self-efficacy.

This scale was originally developed in Germany (Schwarzer & Jerusalem, 1995), and has since been translated into over 28 languages (Luszczynska, Scholz, & Schwarzer, 2005). The psychometric properties of the scale have been explored using large samples of respondents across 13 nationalities: Chinese (Hong Kong) (n = 1068), Indonesian (n = 536), Japanese (n = 430), Korean (n = 147), Arabian (n = 264), Russian (n = 495), Polish (n = 570), Hungarian (n = 158), Greek (n = 100), German (n = 2129), Dutch (n = 679), English (UK) (n = 219) and Spanish (n = 955). Participants were between 15 and 91 years old. Internal consistency ratings were highly satisfactory ranging from .78 (for the Greek adaptation) to .91 (for the Japanese adaptation). The English adaption had a high Cronbach's alpha of .90. Test-retest reliability, over a two year period, was found to be .47 for males and .63 for females. The GSES was tested for unidimensionality with confirmatory factor analyses and a single factor solution was found to fit the data well, suggesting this scale is measuring a unitary construct. Criterion-related validity was established on the basis of appropriate correlations with other tests. Expected positive correlations were found with measures of self-esteem (r=.52, p<.001), internal control beliefs (r=.40, p<.001), and optimism (r=.49, p<.001). Expected negative correlations were obtained with general anxiety (r=-.54, p<.001), performance anxiety

(*r*=-.42, p<.001), shyness (*r*=-.58, p<.001), and pessimism (*r*=-.28, p<.01) (Schwarzer & Jerusalem, 1995). The mean score for the original German version of this scale, based on a sample of 1660 adults, was 29.28 (*SD* = 4.6).

3.4.2.5 Courtauld Emotional Control Scale (CECS).

The CECS, developed by Watson and Greer (1983), was designed to measure emotional control or expressivity. Evidence of an illness-prone personality has been suggested from studies that state that suppression of emotional expression may predict tumor development in cancer patients (Greer & Morris, 1975; Temoshok, 1985). The CECS has three subscales that measure responses to the moods of anger, depression and anxiety using the same seven response modes. Response mode examples include:

When I feel angry (very annoyed) / unhappy (miserable) / afraid (worried),

1. I keep quiet
3. I bottle it up
7. I hide my feelings

Participants were asked to answer the questions by rating on a 4-point Likert scale to what extent they responded this way to the emotions presented. The points on the scale were labeled from *almost never (1)* to *almost always (4)*. High scores on these subscales indicate high levels of emotional suppression.

The psychometric properties of the CECS are derived from a sample of 140 18 to 65 year old normal patients awaiting results of a breast biopsy. Each of the three subscales displayed high Cronbach's alpha values (.86, .88, and .88 for anger, depression, and anxiety, respectively) and test-retest reliability over three to four weeks (.86, .89, .84 for

anger, depression, and anxiety respectively, and 0.95 for the total scale). Concurrent validity for the anxiety subscale of the CECS has been demonstrated using the State-Trait Anxiety Inventory (Spielberger et al., 1970), revealing high scores on the CECS tended to correlate with low scores on direct measures of anxiety. Furthermore, the anger subscale of the CECS correlates negatively with the measure of self-report anger on the trait version of the State-Trait Anxiety Inventory (Spielberger et al., 1970). Additionally, all three CECS subscales show negative correlations with the Bortner self-report Type-A Behaviour scale – a pattern of behaviour describing a hostile, impatient and competitive individual (Bortner, 1969). In a study of 308 women in the early stages of breast cancer, the mean scores for the subscales and total score of the CECS were: Anger = 16.2 (*SD* = 4.8); Anxiety = 17.1 (*SD* = 4.8); Depression = 17.5 (*SD* = 5.0); Total = 50.7 (*SD* = 12.5) (Watson et al., 1991). The present study used the Total score of the CECS and classified this measure as Emotional Suppression. In an attempt to keep the number of variables to a minimum, the Total score was chosen over using the three separate subscales in the analyses of this research.

3.4.3 External Coping facilitators.

3.4.3.1 Duke's Social Support Index (DSSI).

The Dukes Social Support Index (DSSI) is a compact 11-item scale that has been validated for use in an Australian community (Goodger et al., 1999). While social support is considered to strongly influence health (Pedersen et al., 2002; Sarason et al., 1990), research investigating this has been limited by the paucity of brief, psychometrically sound scales suitable for use with older people. The DSSI provides researchers with the opportunity to use a brief measure of social support, which has

been assessed specifically with older Australians. As this measure was designed for use with older individuals, one question from the original 11 items (*Item* 4: How often did you go to meetings of social clubs, religious meetings or other groups you belong to in the past week?) was disregarded as it was not considered relevant to the population in this study. The scale used in this study was therefore comprised of only 10 items. Example items include:

5. Does it seem that your family and friends understand you?

8. When you are talking with family and friends, do you feel you are being listened to?

10. Can you talk about your deepest problems with at least some of your family and friends?

Participants were asked to choose the most appropriate answer, from *none of the time (1)* to *all of the time (5),* for the statements displayed. Higher scores indicate greater levels of perceived social support.

The validity and reliability of the DSSI were tested among a random sample of 565 community dwelling people aged 70 years and over. Participants had a mean age of 76 years. Internal consistency using Cronbach's alpha for the overall index was a reasonable .77. Test-retest reliability (N = 117) scores, at an interval of 22 days, ranged from .70 to .81 (Goodger et al., 1999). Concurrent validity is supported by the DSSI's moderate to strong correlations with the Interview Schedule for Social Interaction (r = .33 to .77, $p<.05$). Construct validity of the DSSI was supported by moderate correlations with physical health - SF-36 (r = .14, $p<.001$), mental health - SF-36 (r = .34, $p<.001$), and life satisfaction (r = .42, $p<.001$) (Powers et al., 2004). To further test construct validity a multiple regression model was used and 25.6% of the variance in

social support was explained using three expected variables; self-rated health, quality of life, and living arrangements. The mean score of the DSSI was 25.6 (*SD* = 2.9) (Powers et al., 2004).

3.4.3.2 Scale of Family Atmosphere (SOFA).

The SOFA was developed by Molloy and Pallant (2002) as a short global measure of family environment or harmony. The scale consists of 10 items. Examples of these items include:

1. My childhood has been a happy one
6. I enjoy being around my family
9. My parents rarely argue

Participants were asked to answer the questions by rating on a 5-point Likert-type scale the extent they agreed or disagreed with each statement. The points on the scale were labeled from *Strongly disagree (1)* to *Strongly agree (5)*. High scores on the scale indicate increased family harmony.

The scale has high internal consistency with a Cronbach's alpha of .87. Principal components analysis revealed two factors, both of which loosely correspond to the Cohesion and Conflict dimensions of the Family Environment Scale (Moos & Moos, 1986). The construct validity of the SOFA was demonstrated in a study of 224 adolescents where there were moderate correlations with measures of depression (r = -.45, p<.001), anxiety (r = -.32, p<.001), self-esteem (r = .36, p<.001), neuroticism (r = -.23, p<.001) and psychoticism (r = -.34, p<0.001) (Molloy & Pallant, 2002). Test-

retest reliability and predictive validity have not been investigated to date. The mean scores for males and females are 38.60 (*SD* = 6.89) and 38.12 (*SD* = 7.35) respectively.

3.4.4 Wellbeing domains.

3.4.4.1 General Health Questionnaire (GHQ-12).

The GHQ was designed by Goldberg (1978) to detect non-psychotic psychiatric disorder in people in the community and medical settings using a self-report questionnaire. It was constructed therefore to identify cases and also to measure degree of disorder. The GHQ-12 (Goldberg, 1992) is a shortened version of the well validated full version, GHQ-60. Consistent with previous investigations that included individuals with chronic conditions (e.g., Hoekstra-Weebers, Jaspers, Kamps, & Klip, 2001), the GHQ-12 was used in this study as an overall index of the psychological adjustment/distress continuum. Each of the 12 items assessed anxiety, insomnia, social dysfunction and severe depression.

Examples of the statements include:

Have you recently:

2. lost much sleep over worry?

5. felt constantly under stain?

11. been thinking of yourself as a worthless person?

Participants were asked to rate on a 4-point Likert scale the extent to which they felt the statement applied to them. The points on the scale were labeled *not at all (1), no more than usual (2), rather more than usual (3),* and *much more than usual (4)*. A high score on this scale indicates a pessimistic health outlook.

The internal consistency, using Cronbach's alpha, of the GHQ-12 ranges from .82 to .90 (Goldberg & Williams, 1988). The test-retest reliability over a six month interval was .73. The predictive validity of the GHQ-12 has been verified by findings showing that high GHQ scores predicted subsequent GP consultations, post-operative distress in breast cancer patients, and recurrence of genital herpes (Ballinger, Smith & Hobbs, 1985; Hughes, 1982; Goldmeier & Johnson, 1982). The mean sensitivity (the probability that a *true case* will be correctly identified) was 93.5%, while the mean specificity (the probability that a *true normal* will be correctly identified) was 78.5% (Goldberg & Williams, 1988). Other studies assessing the concurrent validity of the GHQ-12 against standardised interviews of morbidity showed a satisfactory median correlation of .70 (Goldberg & Williams, 1988). The mean GHQ-12 score for a stratified sample of 552 males working in an engineering plant was 8.80 (*SD* = 4.02) (Banks et al., 1980).

3.4.4.2 Perceived Stress Scale (PSS).

The PSS was developed by Cohen, Kamarck, and Mermelstein (1983) to measure the degree to which situations in an individual's life are appraised as stressful. The full scale, PSS-14, consists of 14 items. The authors suggest however the use of the briefer PSS-10 due to tighter factor structure, good internal reliability and compatibility in predicting outcomes. The present study therefore utilized the PSS-10, with the 10 items in this scale referring to subjective appraisals of events occurring within the time frame of a few weeks.

Examples of the items include:

In the last few weeks, how often have you

2. felt that you were unable to control the important things in your life?

3. felt nervous and 'stressed'?

9. been angered because of things that happened that were outside of your control?

Participants were asked to answer the questions by rating on a 5-point Likert scale how often they thought or felt a certain way during the last few weeks. The points on the scale were labeled *never (1), almost never (2), sometimes (3), fairly often (4),* and *very often (5)*. Items 4, 5, 7 and 8 were reverse scored. High scores on this scale indicate high levels of perceived stress.

The internal consistency of the PSS-10, as measured by Cronbach's alpha, was .85 (Cohen et al., 1983). The test-retest reliability as assessed in college students was .85 over two days, while over six weeks it was a less acceptable .55. The concurrent validity of the PSS-10 was demonstrated in studies of college students where there were modest correlations (r = .17 to .39) with *number* of "life-event scores", and slightly higher correlations (r = .24 to .49) with *impact* of "life-event scores" (Cohen et al., 1983). The mean score on the PSS-10 in a stratified random sample of 2387 people interviewed by telephone was 13.02 (SD = 6.35).

3.4.4.3 Beck Depression Inventory (BDI).

The BDI was developed by Beck, Rush, Shaw, and Emery (1979). It is a self-report measure designed to assess the severity of depression in individuals over the age of 13 in both diagnosed patients and normal populations. The scale consists of 21 statements each covering varied topics.

Examples of "topics" include:

1. Sadness

10. Crying

17. Irritability

Participants were asked to indicate on a 4-point Likert scale (0 – 3) the extent to which they agreed or disagreed with the statements displayed under each "topic" heading. The points on the scale varied for each question. However, generally (0) corresponded to *not feeling that way*, and (3) corresponded to *feeling this way all the time*. High scores on these items indicate depression.

The internal consistency of the BDI, as measured by Cronbach's alpha, was .92 for a group of 500 outpatients; and .93 for a group of 120 college students. The test-retest correlation, based on 26 outpatients tested approximately 1 week apart, was .93. Evidence of convergent validity of the BDI-II is seen through correlations with other psychological tests. Significant positive correlations of the BDI-II were observed with the BDI-A (r = .84, p<.001), the Beck Hopelessness Scale (r = .68, p<.001), the Scale for Suicide Ideation (r = .37, p<.001), the Beck Anxiety Inventory (r = .60, p<.001), and the Hamilton Psychiatric Rating Scale for Depression (r = .71, p<.001), and Anxiety (r = .47, p<.001). The mean BDI-II total score of a subsample of 26 Philadelphia outpatients was 20.27 (SD = 10.46).

3.4.4.4 Adjustment to IBD Scale.

The Adjustment to IBD Scale was developed by Olbrisch and Ziegler (1982) to assess a patient's psychological adjustment to living with IBD. The scale consists of 30 items. Examples of these items include:

1. When someone asks you about your disease, do you give it a more 'socially acceptable' label?

18. Does your illness make you feel less physically attractive?

22. How often are you able to forget about your illness? (reverse scored)

Participants were asked to answer the questions by rating on a 7-point Likert scale to what extent they felt this way about the statements presented. The points on the scale were labeled from *very frequently (1)* to *never (7)*. Items 3, 8, 9, 12, 15, 19, 22, 27 and 30 were reversed scored. High scores on these items indicate high levels of psychological adjustment to living with IBD.

The Adjustment Scale was found to be a reliable and valid instrument for the purposes of Olbrisch and Ziegler's (1982) research. The Cronbach's alpha reliability coefficient was 0.85, suggesting a high degree of internal consistency. The Adjustment to IBD Scale correlated positively (r=.25, p=.02) with the Texas Social Behaviour Inventory (TSBI). Since both scales assess components of psychological adjustment, convergent validity of this scale was demonstrated. A near zero correlation was observed between the Marlowe-Crowne and the Adjustment Scale (r=.007, p=.29) which demonstrated discriminant validity of the Adjustment Scale along the dimension of social desirability.

IBD participants also completed an additional set of questions that were specifically related to their illness. The questions related to participants age at diagnosis, type of condition, medications taken, hospital admissions, surgery and perceived health status.

3.4.5 Cronbach's alpha values for all variables used in the current study.

Cronbach's alpha values found in the current study for all variables are presented in Table 3.1. When employing rules of thumb outlined by Clark & Watson (1995), the majority of measures demonstrated adequate (r > .70) to high (r > .80) reliability coefficients which was consistent with previous research. Two of the subscales of the CSA (Sharing and Optimism coping) displayed Cronbach's alpha of .50 and .27, respectively. Due to the questionable internal reliability of these measures they were omitted from subsequent analyses.

Table 3.1 *Cronbach's Alpha Values for the Measures used within the Current Study*

	Alpha
Personal Disposition	
Negative Affect (PANAS)	.87
Positive Affect (PANAS)	.89
Neuroticism (EPI)	.89
Extraversion (EPI)	.78
Optimism (LOT-R)	.82
Self-esteem (RSE)	.90
Coping-Control	
Internal health LOC (MHLOC)	.74
Chance health LOC (MHLOC)	.65
Powerful others health LOC (MHLOC)	.75
Non productive coping (CSA)	.70
Active coping (CSA)	.71
Perceived control of internal states (PCOIS)	.91
Self-efficacy (GSES)	.85
Emotional suppression (CECS – Total scale)	.92
Social Support (DSS)	.74
Family Harmony (SOFA)	.85
Wellbeing	
General health complaints (GHQ)	.85
Perceived Stress (PSS)	.86
Depression (BDI)	.90
IBD Adjustment	.84

3.5 Measures in Relation to the Framework

As was previously outlined in Chapter 2, this study sought to address the limitations of previous research which lacked a theoretical basis and was devoid of a cohesive conceptual framework. The theoretical design and constructed conceptual framework are both essential and original components of this study. Figure 3.2 illustrates the framework of adjustment to chronic illness utilised in this dissertation – adapted from Molloy and King (1984) and Lazarus (2006) – and the role each variable plays.

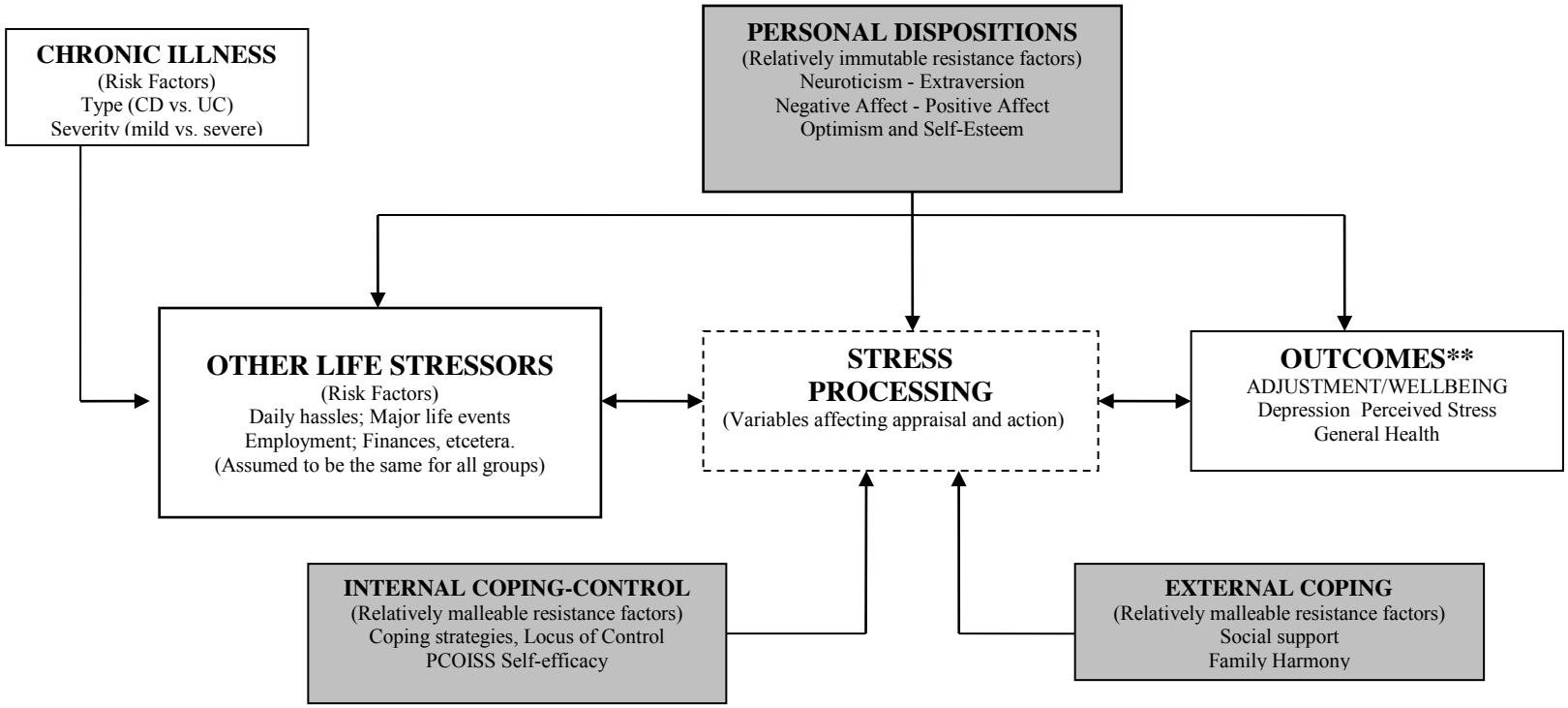
According to the framework, life stressors (i.e., daily hassles, finances, employment) are presumed to be the same for all individuals. Central to the framework is the concept that chronic illness (operationalised in this study as IBD) is an added source of stress, in addition to generalised life stressors. As all participants within the current study were carefully matched, it can therefore be assumed that any differences identified between the two comparison groups will be the result of the IBD group having to cope with ordinary life stressors in addition to the added burden of having a chronic illness.

The framework of adjustment to chronic illness suggests that life stressors - including chronic illness (IBD) - have a direct influence on outcomes (i.e., adjustment / wellbeing). Yet, it is not only the experience of these stressors that determine an individual's overall wellbeing, but also how these stressors are interpreted or processed (Lazarus, 2006). In the framework, "stress processing" represents the means by which an individual deals with stress. That is, how an individual interprets internal or external events determines whether or not they are perceived as "stressful". The adjustment to chronic illness framework depicts personality dispositions, internal coping-control

mechanisms and external coping facilitators as being direct influences on "stress processing". Overall, the framework depicts adjustment/wellbeing as being the outcome of a complex interaction between chronic illness and life stressors (i.e., risk factors), and potential resistance factors (i.e., dispositions, coping and control characteristics) which can modify the way these stressors are processed.

The framework assumes that personality dispositions (e.g., Neuroticism, Negative Affect) are relatively immutable resistance factors – that is, they are considerably less malleable than the other components of the framework. In contrast, the coping – control factors (e.g., PCOIS, social support) are relatively malleable resistance factors, which may be enhanced through intervention. Each of the resistance factors were specifically chosen to be included as part of this research due not only to their satisfactory psychometric properties, but also due to their individual direct effects on wellbeing and adjustment as illustrated by previous literature (see Chapter 2).

With regards to the outcome variables, as was outlined in Chapter 2, past research has often used a limited number of measures to assess wellbeing (for instance utilising GHQ as the sole measure of wellbeing). There is a danger of assuming that chronic illness, whether direct or indirect (i.e., a family member if affected rather than the individual themselves) will negatively influence wellbeing, when it is defined by a single measure (e.g., GHQ12 - as seen in McLean et al., 2004). Furthermore, some studies have utilised measures of perceived stress or depression as their predictors of wellbeing. This is, in effect, trying to predict wellbeing from measures of wellbeing. In order to address these limitations of the extant research, the present study utilised a battery of carefully selected and psychometrically sound wellbeing measures.



*The model assumes that life stressors are, on average, similar for all people within a given culture and that chronic illness represents a unique set of "stressors"

** Outcomes refer to self-report rather than physiological measures

Figure 3.2 Conceptual Framework of Adjustment to Chronic Illness.

Adapted from: Lazarus and Folkman (1984), Molloy (1984, 2007), Lazarus (2006) and Folkman (2010).

3.6 Statistical Analysis

In order to assess the initial study predictions, independent-samples t-tests were conducted to compare the mean scores on intra- and interpersonal measures between individuals with and without IBD; between individuals with CD and UC; and between individuals with mild and severe forms of these conditions. Homogeneity of variances between each of these comparison groups were tested using Levene's test for equality of variances. If homogeneity was not present, Levene's correction was applied and adjusted p-values were used. The effect size statistic (Cohen's *d*) was also utilized to determine the relative magnitude of the differences between the group means. Cohen's (1988) guidelines were employed for interpretation of these values where: $d = .20$ indicates a small effect, $d = .50$ indicates a moderate effect and $d = .80$ indicates a large effect.

Pearson's product-moment correlations (*r*) were carried out in order to establish bivariate relationships between: personal dispositions, coping – control mechanisms and wellbeing measures for both the total sample and also for individuals with and without IBD seperately. Visual inspection of the scatterplots for each bivariate association indicated that the relationships between these variables showed no violations of linearity or homoscedasticity (Appendix C). Furthermore, according to Cohen's (1988) guidelines, a correlation was to be classified as small when $r = .10$, moderate when $r = .30$ and large when $r = .50$.

The next set of statistical techniques employed standard and hierarchical multiple regressions to assess the hypotheses and research questions involving predictors of

wellbeing. The underlying assumptions of this multiple regression technique were checked via visual inspection of the residuals scatterplot and the Normal Probability Plot of the regression standardized residuals (Pallant, 2010) (see Appendix D). No violations of normality, linearity or homoscedasticity were detected. The total variance explained by the included variables for each wellbeing domain is presented as the R^2 value. Cohen's (1988) guidelines were employed for interpretation of effect sizes for hierarchical multiple regression, where: $f^2 = .02$ indicates a small effect, $f^2 = .15$ indicates a moderate effect and $f^2 = .35$ indicates a large effect.

When multiple tests or comparisons are conducted to analyse data, some statisticians suggest that a more stringent criterion level (alpha) be used for 'statistical significance' than the conventional $p < .05$ (Tabachnick & Fidell, 2007). One such technique - the Bonferroni adjustment – modifies the statistical significance for the number of tests that have been performed on the data. Although this correction may help reduce Type I errors (i.e., incorrectly rejecting the null hypothesis), it is also considered overly conservative which in turn increases the likelihood of Type II errors (i.e., incorrectly accepting the null hypothesis) (Perneger, 1998, Nakagawa, 2004). Moran (2003) made the argument for rejecting the use of the Bonferroni method, claiming that it has "several flaws ranging from mathematical to logical to practical". The purpose of this dissertation was to examine differences that may be of practical or clinical significance. Any differences that would be of practical significance would be revealed regardless of 'statistical corrections'. The Bonferroni adjustment was therefore not employed in the results of this study.

3.7 Chapter Summary

This chapter included a description of the recruitment process and the design of the study. The conceptual framework employed in this dissertation, developed specifically as the theoretical rationale for conducting the study and associated predictions, was explained. The measures used in relation to the framework were then explicated in both narrative and diagrammatic form. The chapter concluded with a description of the statistical analyses used to test the major predictions.

Chapter 4: Results

4.1 Chapter Overview

This chapter begins with an initial examination of the data and ensuring there were no violations of the assumptions underlying the use of the statistical techniques. Subsequently, descriptive statistics for the sample overall are presented, which is followed by a more in-depth outline of demographic differences based on IBD type (UC vs. CD) and IBD severity (mild vs. severe). The remaining sections of this chapter contain statistical analyses performed in order to answer the predictions of this dissertation. Each prediction is considered in the order presented in section 2.4.1 of Chapter 2. Analyses not central to testing the predictions of this dissertation were relegated to the appendices. The chapter concludes with a synthesis of the major findings.

4.2 Data cleaning and assumption checking

The raw data obtained from each of the returned questionnaires were analysed by use of SPSS version 20. The data set was initially examined for outliers via 1) the inspection of frequencies and descriptives to check for scores that were out of range, and 2) by comparing the 5% Trimmed Mean to the original Mean score for each study variable, as recommended by Pallant (2010). To obtain a 5% Trimmed Mean, SPSS removes the top and bottom 5% of scores for each variable and recalculates a new mean value. Given that all frequencies and descriptive values were within the expected range, and the 5%

Trimmed Mean values for each variable were not markedly different from the original mean scores, all cases were retained within the data set.

Analyses were conducted to ensure that there were no violations of the assumptions underlying the statistical techniques utilised within this research. All of the study variables were assessed for normality via visual inspection of frequency distributions (see Appendix E) and by applying the following procedures for assessing normality via the SPSS Explore option. The skewness and kurtosis values of the majority of study variables fell within an acceptable distribution range (0 - +/-2) (Pallant, 2010). Only two variables (GHQ and BDI) displayed a kurtosis statistic just outside the recommended range (see Appendix E). Although kurtosis can result in an underestimate of the variance, this risk is reduced with a relatively large sample size (Tabachnick & Fidell, 2007) such as that provided by this study. All measured variables were therefore deemed to be substantially normally distributed, indicating that variable transformations were not required, and that no apparent violations were observed of the statistical techniques to be applied throughout this study.

4.3 Descriptive Sample Statistics

A total of 182 participants (79 males and 103 females) were involved in this study. Of these participants, 95 (42% males and 58% females) were diagnosed with IBD. The 87 (45% males and 55% females) participants who were not diagnosed with this condition hence represented the non-IBD comparison group. Participant characteristics are presented in Table 4.1. A Chi-square test of Independence revealed no association between gender and illness [χ^2 (1) = 0.05, p = .83], indicating that both the IBD and

non-IBD groups consisted of an equal proportion of males and females. The mean age of the total sample was 40.1 years (SD=13.33), with ages ranging from 18 to 88 years. No significant differences were noted between the IBD and non-IBD participant groups with respect to age [t(180)=-.56; p = .58]. Due to successful participant matching based on gender and age, these variables were not required to be controlled for in the proceeding analyses. A Chi-square test of Independence did reveal a significant association between illness (IBD vs. non-IBD) and perceived health status (good vs. poor) [χ^2 (1) = 20.04, p < .001] indicating that the proportion of IBD participants who rated their present health status as poor (n = 26; 27%) was significantly greater than the proportion of non-IBD participants who rated their health status as poor (n = 2; 2.3%). This result was expected given the chronic nature of IBD.

Table 4.1 *Demographics of Study Participants and Clinical IBD Characteristics*

	Non-IBD	IBD	CD	UC	Mild CD	Severe CD	Mild UC	Severe UC
Gender (N)								
Male	39	40	17	21	6	10	8	13
Female	48	55	36	19	8	28	7	10
Age (Years)								
Mean	40.07	39.59	38.23	41.95	35.07	39.26	35.13	45.57
SD	12.70	13.93	12.64	15.64	13.02	12.63	13.79	16.25
Age at Diagnosis (Years)								
Mean	n/a	28.84	28.06	29.87	30.29	27.05	31.40	29.52
SD		11.71	11.37	12.22	13.71	10.55	12.51	12.02
Months since last flare								
Mean	n/a	17.15	16.39	18.19	20.00	15.49	16.57	18.71
SD		26.18	26.73	25.76	28.17	26.75	26.34	26.40
Taking Medication (N)								
Yes	n/a	74	43	31	13	29	11	19
No		19	10	9	1	9	4	4
Hospital Admittance (N)								
Yes	n/a	67	44	23	10	33	7	15
No		24	8	16	4	4	8	8
Undergone Surgery (N)								
Yes	n/a	34	28	6	4	23	2	3
No		59	25	34	10	15	13	20
Perceived health (N)								
Good	85	69	39	30	11	28	12	16
Poor	2	26	14	10	3	10	3	7
Total (N)	87	95	53	40	14	38	15	23

Note 1. Cells contain number of participants *(N)* or Means (and *SD*) within each category.

Note 2. Some cells do not add up to the Total *(N)* as some participants failed to respond to every questionnaire item.

IBD = Inflammatory Bowel Disease; CD = Crohn's Disease; UC = Ulcerative colitis.

4.3.1 Characteristics of IBD participants.

As revealed in Table 4.1, IBD participants reported being diagnosed with this condition at an average age of 28.8 years, and reported to have not experienced a flare-up of their condition for an average of 17 months. Seventy-eight percent (n = 74) of the IBD participants were taking medication for their illness; 71% (n = 67) had been admitted to hospital as a consequence of their illness; and 36% (n = 34) of these participants required surgery as a result of their IBD. This sample is comparable to previous research samples (Casellas et al., 2000; Langholtz et al., 1997), which provides positive implications in relation to the generalisability of these results. Further descriptive statistics for IBD participants based on whether they take medication, have been admitted to hospital, or have undergone surgery are presented in Appendix F. Results of independent samples t-tests are also presented in Appendix F. To briefly summarise these results here, it was found that personal dispositions, coping – control mechanisms and wellbeing measures do not differ significantly between IBD participants based on whether they take medication, have been admitted to hospital, or have undergone surgery. One independent samples t-test did reveal however, that IBD participants who had undergone surgery scored significantly higher on the measure of active coping [$t(90) = 2.93$, $p < .001$] than those who had not undergone surgery as a consequence of their IBD. This result may suggest that undergoing surgery may be regarded as a method of actively coping with their disease.

4.3.2 Characteristics of CD and UC participants.

Of the IBD participants included within this study, 56% (n=53; 32% males and 68% females) had a diagnosis of CD, while 42% (n=40; 52.5% males and 47.5% females) had a diagnosis of UC. Two participants (5%) did not specify with which condition they had been diagnosed. A Chi-square test of Independence indicated no significant gender differences between the CD and UC participants groups [χ^2 (1) = 3.14, p = .08]. Furthermore, there was no significant difference between the mean age of the CD and UC participants [t(91) = -1.20; p = .23]. The proportion of CD participants with mild (48%) and severe (62%) illness did not significantly differ from the proportion of UC participants with mild (52%) and severe (38%) illness [χ^2 (1) = 1.06, p = .30] (see Table 4.1). Figure 4.1 indicates that the proportion of CD participants taking medication (81%) is not significantly different to the proportion of UC participants taking medication (78%) [χ^2(1) = 0.03, p = .87]. However, there was a significantly greater proportion of CD participants admitted to hospital (83%) than UC participants (58%) [χ^2(1) = 6.28, p = .01], and a significantly greater proportion of CD participants who had undergone surgery (53%), than UC participants (15%) [χ^2(1) = 12.48, p < .001]. This result was expected, as previous literature makes note of the increased severity, hospitalisations and required surgeries for CD as compared to UC patients (Langholtz et al., 1997). The proportion of CD participants that rated their present health status as poor (26%) was not significantly different to the proportion of those participants with UC (25%) [χ^2(1) = 0.00, p = 1.00].

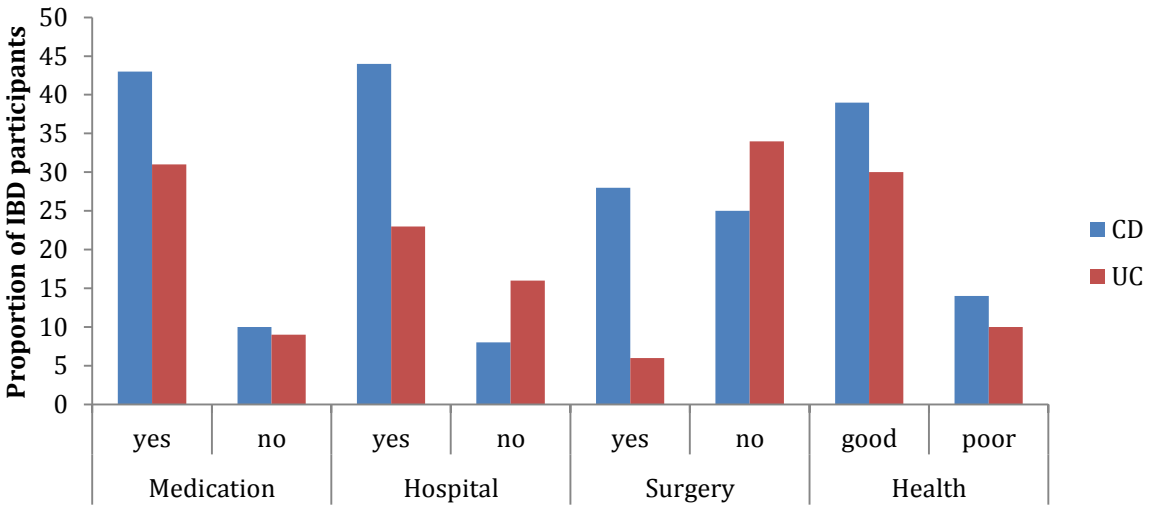


Figure 4.1 Clinical characteristics of CD and UC participants.

Independent t-tests were carried out to determine whether any differences existed between CD and UC participants within the present IBD sample. The results (presented in Appendix F) indicate that with regards to the personal dispositions, coping – control styles and wellbeing measures used within this study, CD and UC participants reported similar levels of each attribute. As a consequence, IBD participants will not be separated into illness type (CD vs. UC) groups for the subsequent analyses of the main research predictions. The only exception to this however is when investigating two of the minor predictions that specifically require a comparison of CD with UC. In this instance therefore, the group will be separated, but the results should be interpreted with caution.

4.3.3 Characteristics of mild and severe participants.

The variable of IBD severity was created by using the number of reported flare-ups IBD participants had experienced. For the purpose of this study, participants who

experienced one or two flare-ups were classified as having “mild” disease. Participants who experienced three or more flare-ups were classified as having “severe” disease.

As shown in Table 4.1, of those participants with mild disease, 14 were male (48%) and 15 were female (52%); while of those with severe disease, 23 were male (38%) and 38 were female (62%). Chi-square tests of Independence indicated no gender differences between either the CD or UC severity groups [CD - χ^2 (1) = 0.65, p = .42; UC - χ^2 (1) = 0.00, p = 1.00]. Although, mild and severe CD participants revealed no significant differences with respect to their age [t(50) = -1.05; p = .30], severe UC participants were found to be significantly older than mild UC participants [t(36) =-2.05; p = .05]. Figures 4.2 and 4.3 present the number of mild and severe participants based on whether they took medication, had been admitted to hospital, had undergone surgery as a result of their condition and how they rated their health status. The data, analysed using Chi-square tests of Independence, illustrated no significant difference between the proportion of mild and severe participants with regards to taking medication [CD - χ^2(1)=.90, p = .34, UC - χ^2(1)=.08, p = .78], hospital admission [CD - χ^2(1) = 1.27, p = .26, UC - χ^2(1)=.63, p = .43], surgery [CD - χ^2(1) = 3.00, p = .08, UC - χ^2(1)=.00, p = 1.00], and perceived health status [CD - χ^2 (1) =.00 , p = 1.00, UC - χ^2(1)=.11, p = .74].

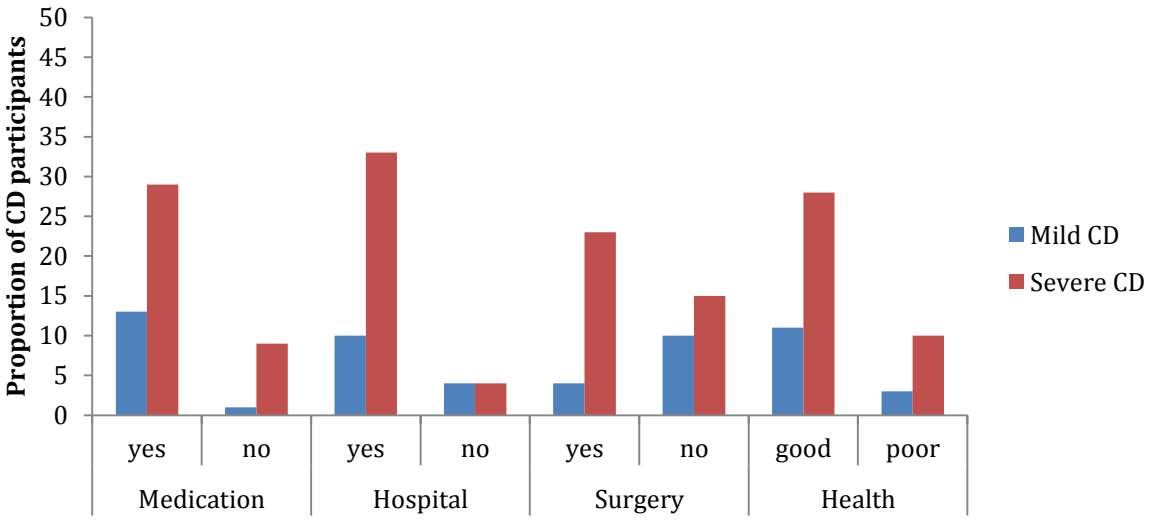


Figure 4.2 Clinical characteristics of Mild and Severe CD participants.

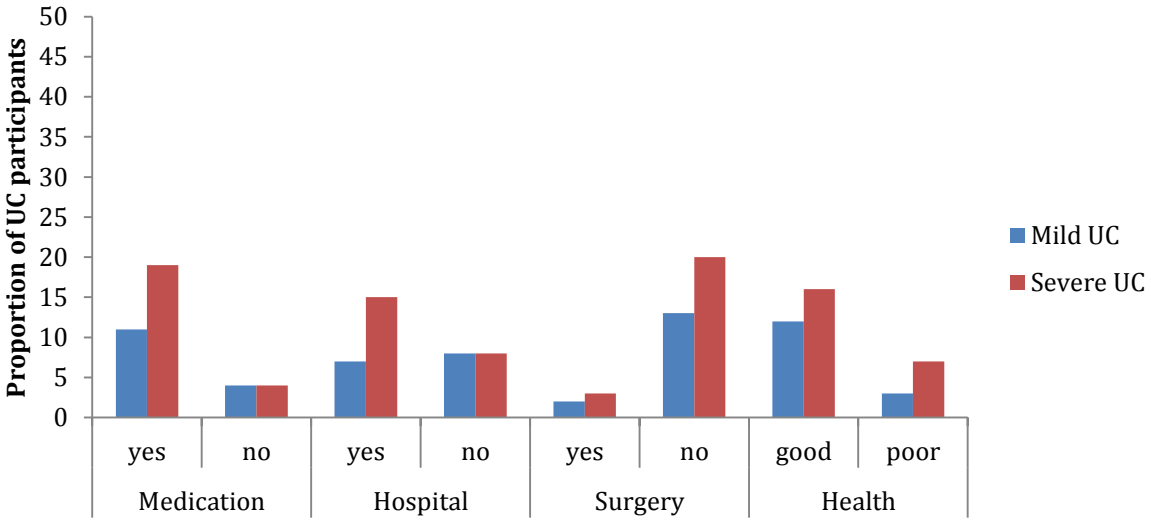


Figure 4.3 Clinical characteristics of Mild and Severe UC participants.

Independent samples t-tests were used to identify whether any differences existed between the IBD groups based on severity (mild vs. severe) on this study's measures of personal dispositions, coping – control mechanisms and wellbeing. The results (see Appendix F) showed that the severity groups (mild CD vs. severe CD; mild UC vs. severe UC) did not significantly ($p > .01$) differ on any of the personal disposition, coping – control mechanism or wellbeing measures. In support of these results, McLean and colleagues (2004) also found their measure of severity was unrelated to all the

resistance and wellbeing factors investigated in their study. Given the small sample sizes within the severity groups in the present study (mild: UC n=15 / CD n=14; severe: UC n=23 / CD n=38) these results were considered potentially misleading. Consequently, in order to increase the power of subsequent analyses, the severity groups were combined and further analyses focused only on illness type (UC vs. CD).

4.3.4 Effects of stress on IBD.

IBD participants were asked to indicate what they felt most contributed to the onset of their condition and subsequent flare-ups. Due to the rarity of longitudinal studies involving IBD, prospective evidence is difficult to find when trying to reveal whether psychological stress plays a role in the origins of this disease. However, some gastroenterologists and IBD participants are of the opinion that stress can influence the course of established disease (Mukherjee et al., 2001). Although no causal role has been established for IBD, the results of this research revealed that 34.1% of IBD participants felt that stress *alone* contributed to their flare-ups; 20.9% believed that both diet and stress contributed to their flare-ups; while 6.6% of participants believed that dietary habits *alone* was what lead to an IBD attack. Twenty three percent of participants reported that nothing in particular had brought about their flare-ups; while 13.2% felt that something other than stress and diet had contributed to their attacks. Only 2.2% of IBD participants revealed that they did not know what contributed to an exacerbation of their condition (see Figure 4.4). Analysing these results further, it can be shown that nearly two thirds (61.6%) of these IBD respondents identified that stress, and to a lesser extent diet, was what contributed to their illness flare-up.

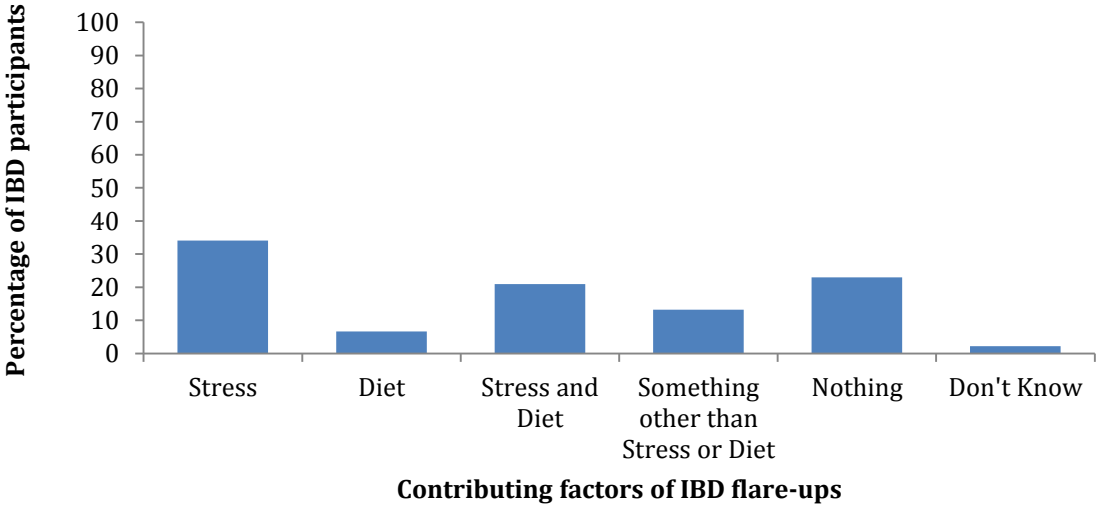


Figure 4.4 Contributors of flare-ups as reported by the IBD participants.

4.3.5 Age and gender differences.

Pearson-product moment correlations were conducted to determine whether any relationships existed between age and measures of personal dispositions, coping – control styles and wellbeing for each of the comparison groups. In addition, independent t-tests were carried out to determine whether any study variables differed between the comparison groups based on gender. These results are presented in Appendix F and indicate that the vast majority of these variables (97% of all correlations and 100% of all t-tests performed, $p > .01$) were unaffected by age or gender. These findings provide evidence that age and gender will not act as confounding variables within this research.

The present IBD sample is considered representative of IBD patients in general, due to comparable descriptive statistics with that found in previous research (Morino-Jimenez et al., 2007; van der Zaag-Loonen et al., 2004). The above results also suggest that participants from the IBD and non-IBD groups were successfully matched based on age

and gender, and as these factors displayed no relationship to the personal disposition, coping – control and wellbeing measures of this study, age and gender are not considered to be confounding variables within the present study. After revealing that the IBD type (CD vs. UC) and severity (mild vs. severe) groups displayed similar scores on the measures of personal dispositions, coping – control mechanisms and wellbeing, along with the small sample size of these groups, it was decided to combine the IBD type and severity groups for the remaining major analyses. The following sections of this chapter provide the statistical analyses performed in order to answer the predictions outlined in Chapter 2.

4.4 Predictions and results

The predictions, generated in Chapter 2, are presented again along with their corresponding analyses.

4.4.1 Prediction 1: Between group differences based on wellbeing.

Numerous research papers have established that life stress contributes to decreased wellbeing (Engstrom, 1991; Kovacs & Kovacs, 2007; Mackner & Crandall, 2006; Sharpley, 1994; Sheffield & Carney, 1976). An important logical assumption of the framework of this study is that life stressors are common to both IBD and non-IBD groups. Life stressors have however been manipulated within this research design as chronic illness (IBD) represents an identifiable added source of stress for the IBD group. It was assumed therefore that any identifiable differences between the two

comparison groups could be linked to the fact that the IBD group has this added source of stress. It was predicted that the IBD group in comparison to the non-IBD group would have higher mean scores on the three common measures of wellbeing: General health concerns, perceived stress and depression. This prediction was assessed using three independent samples t-tests and was found to be supported (results presented in Table 4.2). Therefore, as expected, due to the fact that the IBD respondents possess an *added* identifiable source of stress (i.e., their chronic illness), their wellbeing scores were seen to suffer. Cohen's *d* effect sizes (also reported in Table 4.2) were found to be of moderate to large magnitude, indicating that the wellbeing differences between the IBD and non-IBD participants are of practical significance and therefore likely to be readily observable on the behaviour and affect of IBD and non-IBD individuals.

4.4.2 Prediction 2: Between group differences based on personal dispositions.

Personality, in particular neuroticism, has been linked to somatic complaints and illness (Grossarth-Maticek & Eysenck, 1991). A number of studies have also linked neuroticism with IBD (Gazzard et al., 1978; Robertson et al., 1989; Shefield & Carney, 1976). As a consequence some researchers have discussed the possibility of a disease-prone personality for IBD. Robertson et al. (1989) predicted that IBD was more likely to develop in individuals with a predisposed personality. In their study they found that neuroticism scores were more prevalent in IBD participants than in a control group. Furthermore, increased neuroticism was found in both established cases of IBD and in those prior to an IBD diagnosis. It was concluded that the personality disposition, neuroticism, is not simply the result of having this chronic condition, but is part of the

premorbid personality. Based on the findings of Robertson et al. (1989), it was predicted that the IBD group would score significantly higher on neuroticsm than the non-IBD group.

The results of this study failed to illustrate the existence of an IBD-prone personality as suggested by Robertson et al. (1989). Participants with IBD, compared to non-IBD participants, were not found to possess significantly higher levels of neuroticism. Additional analyses were carried out to identify other potential personal disposition differences between the IBD and non-IBD groups. The results obtained from independent samples t-tests (see Table 4.2) indicate that, apart from negative affect [$t(160) = 2.50$, $p = .01$, $d = .38$], IBD respondents were not seen to differ significantly to their non-IBD counterparts with regards to any of the included personal disposition measures. The following Chapter will discuss the theory, by Watson and Pennebaker (1989), of negative affect as being a potential nuisance variable in the stress and health literature.

4.4.3 Prediction 3: Between group differences based on coping - control styles.

Research has reported that as factors contributing to IBD relapse remain uncertain, it is difficult for the individual to experience the disease course as being contingent on their own behaviour. Engstrom (1991) indicated that IBD volunteers display higher levels of external LOC compared to a control group. IBD volunteers are also reported to possess ineffective coping strategies when dealing with stress (van der Zaag-Loonen, 2004). Maunder and Esplen (1999) uncovered that the greatest issue for IBD participants was a

lack of social support and isolation. Engstrom (1999) identified significantly higher rates of family dysfunction in IBD families compared to those with healthy children. Based on these findings, it was predicted that IBD participants compared to their non-IBD counterparts would report significantly poorer scores on internal coping-control measures (increased non-productive coping; increased chance and powerful others health LOC; decreased internal health LOC; decreased PCOISS; decreased self-efficacy) and poorer scores on external coping measures (decreased social support and family harmony).

These predictions were assessed using independent samples t-tests and a number were found to be supported (results presented in Table 4.2). As expected, due to the clinical course of IBD not being contingent on the actions of the patients themselves, increased non-productive coping, external health control and decreased internal health control were evident for these participants. Cohen's *d* effect sizes (also reported in Table 4.2) were found to be of medium to large magnitude, indicating that the coping - control mechanism differences between the IBD and non-IBD participants are of practical significance and hence likely to be readily observable on the behaviour and affect of IBD and non-IBD individuals.

No significant differences were identified between the IBD and non-IBD groups on the coping-control measures of active coping, perceived control of internal states, self-efficacy and emotional suppression. The results of this research further failed to support the prediction that the IBD group, compared to the non-IBD group, would score significantly lower on external coping measures with both participant groups scoring similarly on the measures of social support and family harmony.

Table 4.2 *Descriptive Statistics and t-values for Differences on Study Variables Between IBD and non-IBD Comparison Groups*

	non-IBD (*n*=87)		IBD (*n*=95)				Cohen's
	M	*SD*	*M*	*SD*	*t(df)*	*p*	*d*
Personal Dispositions							
Negative Affect	18.68	6.07	21.39	8.02	2.50(160)	.01	.38
Positive Affect	33.75	6.58	32.07	7.87	-1.52 (170)	.13	.23
Neuroticism	58.15	9.10	60.16	9.97	1.41(176)	.16	.21
Extraversion	63.20	6.82	63.34	7.01	0.14(178)	.89	.02
Optimism	21.55	3.67	21.10	4.87	-0.72(172)	.48	.10
Self-esteem	30.55	4.56	29.86	5.01	-0.97(178)	.34	.14
Coping-Control							
Internal LOC	25.57	4.39	22.36	4.93	-4.53(172)	<.01	.69
Chance LOC	16.51	4.41	18.28	5.30	2.38(171)	.02	.36
Powerful others LOC	14.20	4.15	19.47	6.01	6.79(159)	<.01	1.02
Non productive coping	50.72	13.07	56.33	15.57	2.61(179)	.01	.39
Active coping	61.24	13.44	58.79	14.21	-1.19(179)	.24	.18
PCOIS	61.89	9.85	59.91	10.70	-1.28(178)	.20	.19
Self-efficacy	29.71	3.00	29.08	3.80	-1.24(177)	.22	.18
Emotional suppression	52.17	10.75	53.65	11.72	0.87(173)	.39	.13
Social Support	39.20	5.87	38.31	6.13	-0.99(179)	.32	.15
Family Harmony	40.18	5.90	39.37	6.42	-0.88(176)	.38	.13
Wellbeing							
GHQ	22.97	3.53	24.56	5.05	2.44(158)	.02	.37
Perceived Stress	24.48	5.82	26.95	6.25	2.73(177)	.01	.41
Depression	28.09	7.16	31.77	7.50	3.34(176)	<.01	.50
IBD Adjustment	n/a	n/a	151.36	23.62	n/a	n/a	n/a

Note. LOC=Locus of Control; PCOIS=Perceived Control of Internal States; GHQ=General health complaints

4.4.4 Prediction 4: Predictors of wellbeing.

As personal dispositions measure stable constructs of individual differences, it was predicted that they would provide a stronger influence on wellbeing measures than the more transitory coping-control variables. In addition, following the results of Moreno-Jimenez et al. (2007) it was predicted that the personal dispositions of neuroticism and self-esteem would be significant predictors of wellbeing, with neuroticism being the stronger predictor. This prediction was explored with the use of Pearson's (*r*) correlation analyses (see Table 4.3) and multiple regression analyses (see Table 4.4 and 4.5). These analyses were performed using the IBD and non-IBD groups combined, in order to increase the power of the analyses (Tabachnick & Fidell, 2007). However, these analyses were also performed separately for both the IBD and non-IBD comparison groups as a means of exploring potential differences in wellbeing predictors between participants with and without chronic illness. These supplementary analyses are presented in Appendices G and H should the reader be interested.

Support was established for the prediction that personal dispositions would provide a stronger influence on wellbeing domains than the coping-control mechanisms. As Table 4.3 illustrates, personal dispositions are significantly associated with each of the four wellbeing domains. In particular, neuroticism, negative affect and self-esteem display the strongest associations with the wellbeing domains. Neuroticism was most closely related to perceived stress ($r = .57$; $p < .001$) and depression ($r = .56$; $p < .001$); negative affect and perceived stress were most closely linked ($r = .68$; $p < .001$); and self-esteem was correlated most strongly with depression ($r = .60$; $p < .001$). According

to Cohen's (1988) guidelines for interpreting effect sizes, each of these associations were classified as having a large practical significance.

When observing the correlations between coping-control mechanisms and wellbeing (see Table 4.3), it can be seen that these correlations are generally weaker than the correlations between personal dispositions and wellbeing domains. Of the coping-control mechanisms, non-productive coping and perceived control of internal states displayed the strongest associations with each wellbeing domain. According to Cohen's (1988) guidelines, non-productive coping displayed a moderate association with depression ($r = .43$; $p < .001$); and perceived control of internal states revealed a large association with perceived stress ($r = -.63$; $p < .001$).

Table 4.3 *Correlations Between Personal Disposition, Coping-Control and Wellbeing Variables for the Whole Sample (N = 182)*

Whole Sample	N	E	NA	PA	Optimism	Self Esteem	NP Coping	Active Coping	Internal LOC	Chance LOC	PO LOC	PCOIS	Self Efficacy	Emot. Suppr'n	Social Support	Family Harmony	GHQ	Stress	Dep'n	IBD Adj
Personal disposition																				
Neuroticism	-																			
Extraversion	.19*	-																		
Negative Affect	.51***	-.03	-																	
Positive Affect	-.18*	.40***	-.17*	-																
Optimism	-.44***	.40***	-.34***	.40***	-															
Self-esteem	-.55***	.45***	-.34***	.50***	.54***	-														
Coping-Control																				
Non productive coping	.58***	-.10	.44***	-.13	-.31***	-.35***	-													
Active coping	.06	.32***	.07	.54***	.29***	.24**	.18*	-												
Internal LOC	-.06	.10	-.10	.31***	.25**	.24**	-.06	.20**	-											
Chance LOC	.16*	-.07	.07	-.10	-.23**	-.13	.29***	-.08	-.21**	-										
Powerful others LOC	-.06	-.03	.06	-.02	-.07	.08	.07	-.03	-.13	.26***	-									
PCOIS	-.59***	.30***	-.50***	.34***	.55***	.59***	-.49***	.21**	.15*	-.09	.02	-								
Self-efficacy	-.33***	.32***	-.17*	.38***	.38***	.53***	-.24***	.30***	.32***	-.11	-.05	.54***	-							
Emotional suppression	.29***	-.37***	.07	-.21**	-.29***	-.29***	.31***	-.11	.03	.14	.02	-.24**	-.20**	-						
Social Support	-.30***	.41***	-.13	.29***	.42***	.43***	-.16*	.20**	.11	-.22**	.01	.29***	.16*	-.33***	-					
Family Harmony	-.34***	.29***	-.22**	.23**	.46***	.41***	-.23**	.23**	.02	-.12	-.00	.40***	.20**	-.23**	.38***	-				
Wellbeing																				
GHQ	.43***	-.13	.63***	-.37***	-.26***	-.49***	.34***	-.08	-.17*	.09	.05	-.47***	-.30***	.18*	-.15*	-.23**	-			
Perceived Stress	.57***	-.18*	.68***	-.31***	-.40***	-.52***	.35***	-.07	-.22**	.01	.08	-.63***	-.31***	.11	-.16*	-.39***	.67***	-		
Depression	.56***	-.22**	.54***	-.43***	-.37***	-.59***	.43**	-.12	-.19*	.05	.05	-.53**	-.33**	.36**	-.36**	-.37**	.63***	.61***	-	
IBD Adjustment	-.49***	.19	-.40***	.37***	.40***	.55***	-.55***	-.05	.26*	-.19	.04	.36***	.32**	-.31**	.30**	.18	-.36***	-.44***	-.60***	-

Note. N = neuroticism; E = extraversion; NA = negative affect; PA = positive affect; NP Coping = non-productive coping; LOC = locus of control; PCOIS = perceived control of internal states; GHQ = general health complaints. *$p < .05$; ** $p < .01$; *** $p < .001$

Further support for this prediction was revealed with the use of standard multivariate regression procedures, which aimed to determine the strongest personal disposition and coping – control predictors of wellbeing. Tables 4.4 and 4.5 present the standardised regression coefficients for these analyses using the whole sample. The models for both the personal disposition predictors – $F(6, 162) = 29.55$ for GHQ; $F(6, 164) = 37.79$ for Stress; $F(6, 164) = 32.36$ for Depression, and coping-control predictors – $F(10, 160) = 5.47$ for GHQ; $F(10, 160) = 14.69$ for Stress; $F(10, 160) = 11.83$ for Depression, were all significant at the $p < .001$ level.

As shown in the regression analyses (see Tables 4.4 and 4.5), the majority of personal dispositions and coping-control mechanisms were significantly associated with at least one wellbeing domain. However, in contrast to the prediction that neuroticism and self-esteem would be the strongest personal disposition predictors of wellbeing, these results identified that NA was the most highly related personal disposition to all wellbeing domains (see Table 4.4). High levels of NA were strongly associated with increased general health complaints ($\beta = .53$, $p < .001$) and perceived stress ($\beta = .50$, $p < .001$), and moderately associated with increased depression ($\beta = .32$, $p < .001$). With regards to the coping-control variables, Table 4.5 reveals that perceived control of internal states is the strongest coping-control predictor of all wellbeing domains. High perceived control moderately predicted decreased health complaints ($\beta = -.34$, $p = .001$), strongly predicted decreased perceived stress ($\beta = -.59$, $p < .001$) and moderately predicted decreased depression ($\beta = -.27$, $p = .002$).

Personal dispositions are seen to explain between 52% and 58% (see Table 4.4) of the variance in wellbeing. According to Cohen's (1988) effect size guidelines, this amount

of variance explained is considered to be of very strong practical importance. The coping-control measures were shown to explain between 26% and 48% (see Table 4.5) of the variance in wellbeing. Although lower values were obtained for the coping-control compared to the personal disposition predictors, this amount of variance explained is also considered to be of strong practical importance (Cohen, 1988).

Standard multivariate regression procedures were conducted separately for both the IBD and non-IBD comparison groups with a similar pattern of findings being revealed for each group. These analyses are presented in Appendix H should the reader be interested.

Table 4.4 *Multivariate Regression Procedures for the Personal Disposition Predictors of Wellbeing for the Whole Sample (N = 182)*

	Models predicting		
Personal Disposition	**GHQ**	**Perceived Stress**	**Depression**
Neuroticism	.04	.19**	.23***
Extraversion	.03	-.00	.03
NA	.53***	.50***	.32***
PA	-.21**	-.09	-.23***
Optimism	.17*	-.01	.08
Self-esteem	-.29***	-.21**	-.30***
R^2 (Adj R^2)	.52 (.51)	.58 (.57)	.54 (.53)
f^2	1.08	1.38	1.17

*$p < .05$; ** $p < .01$; *** $p < .001$

Note. The standardized regression coefficient (β) for each variable is presented. f^2 refers to Cohen's (1988) effect size measure for multiple regression.

Table 4.5 *Multivariate Regression Procedures for the Coping - Control Predictors of Wellbeing for the Whole Sample (N = 182)*

	Models predicting		
Coping – control	**GHQ**	**Perceived Stress**	**Depression**
Non-productive	.13	.05	.23**
Active	.01	.09	-.01
Internal LOC	-.10	-.19**	-.14*
Chance LOC	-.03	-.12	-.16*
Powerful others LOC	.04	.10	.07
PCOIS	-.34***	-.59***	-.27**
Self-Efficacy	-.04	.08	-.01
Suppression	.05	-.03	.16*
Social Support	.01	.06	-.16*
Family Harmony	-.06	-.21**	-.12
R^2 (Adj R^2)	.26 (.21)	.48 (.45)	.43 (.39)
f^2	.35	.92	.75

*$p < .05$; ** $p < .01$; *** $p < .001$

Note. The standardized regression coefficient (β) for each variable is presented. f^2 refers to Cohen's (1988) effect size measure for multiple regression.

4.4.5 Research question: Coping-control predictors as added value for predicting wellbeing.

Coping – control variables have been implicated as potentially adding to the prediction of wellbeing, over and above that of personal dispositions. This is important for remediation purposes as coping – control variables can be modified, while the dispositional factors are regarded as relatively immutable.

Hierarchical multiple regression analyses were therefore conducted to explore whether the set of coping-control variables added to the prediction of wellbeing beyond that accounted for by the included personal dispositions alone (see Table 4.6). After statistically controlling for the variance explained by the personal dispositions (Step 1), the included coping-control variables, entered in Step 2, significantly ($p < .001$) explained an additional 10% of the variance in perceived stress (from 58% to 68%; f^2 = moderate = .31); and significantly ($p < .01$) explained an additional 7% of the variance in depression (54% to 61%; f^2 = moderate = .18). The included coping-control variables did not significantly add to the prediction of GHQ (from 52% to 54%, $p > .05$). Thus, the coping-control variables did contribute to the prediction of some measures of wellbeing over and above the personality dispositions with effect sizes indicating a moderate level of practical significance. This observation is important for remedial purposes and may be worthy of future investigation.

Separate regression analyses conducted for the IBD and non-IBD comparison groups also indicated that the coping-control measures provided a moderate degree of added influence on certain wellbeing measures, beyond that accounted for by the personal disposition measures alone (these analyses are presented in Appendix H for the interested reader).

Table 4.6 *Multivariate Regression Procedures for Predicting Indicators of Wellbeing for the Whole Sample (N = 182)*

	GHQ		Perceived Stress		Depression	
Personal Disposition	β Step 1	β Step 2	β Step 1	β Step 2	β Step 1	β Step 2
Neuroticism	.04	.02	.19**	.21**	.23***	.15
Extraversion	.03	.05	-.00	-.01	.03	.11
Negative Affect	.53***	.52***	.50***	.42***	.32***	.30***
Positive Affect	-.21**	-.21**	-.09	-.09	-.23***	-.21**
Optimism	.17*	.21**	-.01	.08	.08	.16*
Self-esteem	-.29***	-.28**	-.21**	-.17*	-.30***	-.27***
R^2	.52	.52	.58	.58	.54	.54
Coping – Control		β Step 2		β Step 2		β Step 2
Non-productive		-.05		-.14*		.06
Active		.04		.05		.01
Internal LOC		-.03		-.14**		-.08
Chance LOC		.02		-.09		-.12*
P. others LOC		.05		.10*		.10
PCOIS		-.09		-.31***		-.06
Self-Efficacy		-.02		.09		.04
Suppression		.10		-.01		.19**
Social Support		.06		.13**		-.10
Family Harmony		-.04		-.17**		-.09
R^2		.54		.68		.61
R^2_{change}		.02		.10***		.07**
Cohen's effect size (f^2)		.04		.31		.18

*$p < .05$; ** $p < .01$; *** $p < .001$

Note. For final models, F(16, 150)=11.00, p = .839 for GHQ; F(16, 150)=19.66, p < .001 for Stress;
F(16,150)=14.74, p = .005 for Depression. The standardized regression coefficient (β) is presented for each variable.

4.5 Minor Predictions and results

Each of the minor predictions presented in Chapter 2 are subsequently presented along with the corresponding analyses.

4.5.1 Minor Prediction 1.

Approximately 75% of participants with CD require surgery at some point during the course of their illness, while only 40% of UC participants require this course of action (Langholtz et al., 1997). Schwarz (1989) reported that CD participants displayed increased anxiety, psychological distress and symptom severity than participants with UC. Futhermore, Casellas and colleagues (2000) identified that active CD impairs participants health related quality of life (HRQOL) significantly more than active UC. It was predicted therefore that participants with CD, compared to UC, would report higher scores on the wellbeing measures of general health complaints, perceived stress and depression and lower IBD Adjustment scores. These predictions were not supported however, as shown in Table 4.7.

Table 4.7 *Means, Standard Deviations and t-values for the Differences in Wellbeing Measures Between CD and UC Participants*

	CD (*n*=52)		UC (*n*=38)				
Wellbeing	*M*	*SD*	*M*	*SD*	*t (df)*	*p*	Cohen's *d*
GHQ	24.60	5.38	24.51	4.62	0.08 (87)	.94	.02
Perceived Stress	26.58	6.16	27.44	6.42	-0.64 (90)	.52	-.14
Depression	32.51	7.50	30.74	7.47	1.11 (89)	.27	.24
IBD Adjustment	149.81	23.68	153.46	23.68	-0.73 (90)	.47	-.15

Note. CD=Crohn's Disease; UC=Ulcerative Colitis; GHQ=General health complaints; IBD=Inflammatory Bowel Disease.

4.5.2 Minor Prediction 2.

Many reports have suggested significant associations between poor wellbeing and increased IBD severity (Casellas et al., 2000; Cunningham et al., 2007; Guthrie et al., 2002; Larsson et al., 2008; Thirlby et al., 1998; van der Zaag-Loonen et al., 2004). Other reports in the literature could not identify an association between severity and adjustment/wellbeing (Gazzard et al., 1978; Turnbull & Vallis, 1995). However, Turnbull and Vallis (1995) illustrated that when IBD activity was combined with poor coping and psychosocial distress, this combination of factors predicted poor wellbeing. It was predicted that IBD participants classed as more severe, compared to those with mild IBD, would report higher scores on the wellbeing measures of general health complaints, perceived stress and depression, and lower IBD Adjustment scores. These predictions were not supported however, as shown in Table 4.8.

Table 4.8 *Means, Standard Deviations and t-values for the Differences in Wellbeing Measures Between Mild and Severe CD and UC Participants*

	Mild CD (*n*=14)		**Severe CD (*n*=38)**				
Wellbeing	*M*	*SD*	*M*	*SD*	*t (df)*	*p*	Cohen's *d*
GHQ	25.00	4.51	24.43	5.80	.33 (49)	.74	.11
Perceived Stress	26.79	5.73	26.68	6.38	.05 (50)	.96	.02
Depression	31.21	6.68	32.92	7.90	-.72 (50)	.48	-.23
IBD Adjustment	152.71	23.66	149.45	23.85	.44 (50)	.66	.14
	Mild UC (*n*=15)		**Severe UC (*n*=23)**				
Wellbeing	*M*	*SD*	*M*	*SD*	*t (df)*	*p*	Cohen's *d*
GHQ	23.13	5.30	25.50	4.03	-1.50 (33)	.14	-.50
Perceived Stress	26.13	4.52	28.55	7.20	-1.15 (35)	.26	-.40
Depression	27.73	5.27	31.67	6.24	-1.99 (34)	.06	-.68
IBD Adjustment	153.33	24.17	155.36	22.38	-.26 (35)	.80	-.09

Note. CD=Crohn's Disease; UC=Ulcerative Colitis; GHQ=General health complaints; IBD=Inflammatory Bowel Disease.

4.5.3 Minor Prediction 3.

With the use of a questionnaire, Morris et al. (2001) established that the rates of IBD were twice as high in left-handers as in right-handers. This study predicted therefore that there would be an increased proportion of left-handed IBD participants, compared to left-handed non-IBD participants. The results of a Chi-square test did not support this prediction. Table 4.8 shows that the IBD group (54.5%) and the non-IBD group (45.5%) displayed a similar proportion of left-handers [χ^2 (1) = 0.00, p=.99].

Table 4.9 *Proportion of Right- and Left-Handers in the IBD and non-IBD Sample*

	HANDEDNESS		
	Right	**Left**	**Total (*n*)**
IBD	83	12	95
non-IBD	77	10	87
Total (*n*)	160	22	182

4.6 Chapter Summary

This chapter contained the statistical analyses performed in order to answer the predictions and research questions of this study. In summary, the results of the analyses confirmed that wellbeing is significantly lower for the IBD participant group, in comparison to the non-IBD participant group. It was also revealed that the majority of personal dispositions and coping-control measures were comparable between the IBD and the non-IBD comparison groups. Although a small number of personal dispositions and coping-control measures did differ between the two comparison groups, these differences were not shown to contribute to the noted significant differences in wellbeing. For both the IBD and non-IBD comparison groups, negative affect was identified as the strongest personal disposition predictor of wellbeing; and PCOIS was seen as the strongest coping-control predictor of wellbeing. Correlation and multiple regression analyses demonstrated that the included coping-control measures predicted wellbeing with a small to moderate level of significance over and above the personality dispositions. The results obtained within this chapter will be discussed further in the following chapter, along with limitations of the current study and implications for the wider population.

Chapter 5: Discussion

5.1 Chapter Overview

This chapter reviews the results of the data analyses reported in the previous chapter and discusses these findings along with their implications for the wider population. Following the preliminary analyses, each of the research predictions are restated and discussed separately. The chapter concludes with a discussion of some limitations of the study and proposals for future research directions.

5.2 Preliminary Analyses

The first set of analyses undertaken as part of this research involved extracting and summarizing general and clinical information for each comparison group. Participants' responses were analysed in relation to six comparison groups based on the following categories: Illness (IBD vs. non-IBD); IBD type (UC vs. CD) and IBD severity (mild vs. severe). Analyses were then conducted to determine whether any age, gender or other clinical IBD related differences existed between these groups.

5.2.1 IBD vs non-IBD.

The IBD and non-IBD participant groups were successfully matched based on age and gender, thus revealing no significant differences on these factors. However, a significantly greater proportion of IBD participants, compared to non-IBD participants,

rated their present health status as poor [X^2 (1) = 20.04, p<.0001]. This finding is not surprising given that the IBD patient group is living with a chronic health concern.

5.2.2 CD vs UC participants.

No significant differences were noted between the CD and UC participant groups with regards to gender, age, taking medication and perceived health status. Chi-square tests did reveal however, that in comparison to UC participants, a significantly greater proportion of CD participants had been admitted to hospital and had undergone surgery. This result is in support of the findings of Langholtz et al., 1997, in which they state that up to 75% of individuals with CD, compared to only 40% of those with UC require surgery at some stage during the course of their illness. Furthermore, no significant differences emerged between CD and UC participants with regards to personality dispositions, use of coping – control strategies and wellbeing domains.

5.2.3 Effects of stress on IBD.

Due to the rarity of longitudinal studies involving IBD, prospective evidence is difficult to find when trying to reveal whether psychological stress plays a role in the origins of this disease. In addition, links between stress and IBD exacerbations have been difficult to confirm, due to the oft reported inconsistencies in the stress-health literature. With the use of qualitatively different scales as a way of measuring stress, it is not surprising that mixed results have ensued. As a way of exploring whether stress contributed to flare-ups within this research group, IBD participants were asked what they felt most

contributed to the onset of their condition and subsequent flare-ups. As the results indicate 55% of participants believe that stress influenced the course of their disease. Specifically, 34.1% of participants felt that stress alone contributed to their IBD flare-ups; 20.9% believed that both stress and diet contributed to their flare-ups; while only 6.6% of participants believed that their dietary habits was what lead to an attack of their IBD. Twenty three percent of participants reported that nothing in particular had brought about their flare-ups; while 13.2% felt that something other than stress and diet had contributed to their attacks. Only 2.2% of IBD participants revealed that they did not know what contributed to an exacerbation of their condition. The findings of this study further revealed that IBD participants perceived significantly more stress (as measured by the PSS) than the non-IBD comparison group.

5.3 Overview and Discussion of Results: Predictions 1, 2 and 3

In the early to mid twentieth century, personality factors such as immaturity, dependency and obsessive traits were considered important in the precipitation and recurrence of IBD, in particular UC (Robertson et al., 1989). Furthermore, personality dispositions, such as N, and ineffective coping-control styles shared by IBD participants were presumed to be associated with having had to endure the troublesome symptoms of this long standing chronic illness (Gazzard et al., 1978; Rubino et al., 1999). More recently, it has been suggested that certain pre-existing personality dispositions and methods of coping are more likely to influence wellbeing and IBD adjustment, rather than the condition itself (Moreno-Jimenez et al., 2007). These assertions will be considered in the following sections.

The first set of study predictions involved comparing individuals with and without IBD on a number of personality dispositions, coping – control strategies and wellbeing measures.

5.3.1 Prediction 1: Group differences based on wellbeing.

Numerous research papers have established that life stress contributes to decreased wellbeing (Engstrom, 1991; Kovacs & Kovacs, 2007; Mackner & Crandall, 2006; Sharpley, 1994; Sheffield & Carney, 1976). An important logical assumption of the framework of this study is that life stressors are common to both IBD and non-IBD groups. Life stressors have however been manipulated within this research design, as chronic illness (IBD) represents an identifiable added source of stress for the IBD group. It is assumed therefore that any identifiable differences between the two comparison groups will be linked to the fact that the IBD group has this added source of stress. It was predicted that the IBD group, in comparison to the non-IBD group, would report higher scores on the three common measures of wellbeing (general health concerns, stress and depression).

This study's conceptual framework of "Adjustment to Chronic Illness" assumes that life stressors are, on average, the same for all people within a given culture. Any differences in wellbeing scores between the two comparison groups are associated with the fact that the IBD group possess an *added* and unique source of identifiable stress – that being their chronic illness. The prediction that IBD participants, compared to participants without IBD, would report lower scores on measures of wellbeing was supported by the results of independent t-tests. More specifically, IBD participants reported significantly

more general health complaints, perceived stress and symptoms of depression than the non-IBD comparison group.

Wellbeing is justifiably diminished in individuals who have been diagnosed with a chronic and debilitating illness, like IBD (Casellas, 2000; Gazzard et al., 1978). It is accepted that IBD participants will become apprehensive at having to endure the varied consequences of this disease. These include painful abdominal cramps, unpredictable bowel movements and the persistent threat of hospital admissions and surgery. IBD participants are unlikely to exude positivity and hope, as not only does the cause and cure of this illness remain unknown, medical intervention only offers short-term success (Thirlby et al., 1998). Having to withstand the unpredictable and relentless effects of this illness may also prevent IBD participants from participating freely in many of life's activities. Participants often report feeling that their life is controlled by their illness, and consequently refer to their IBD as an overwhelming life burden (Olbrisch & Ziegler, 1982a). It is not surprising that this reaction would contribute to heightened reports of depression, perceived stress and generalized health concerns.

A note of importance however, is that although the IBD group scored significantly lower on all wellbeing measures, this group did not score low enough to warrant classification within the clinical range of maladjustment. Individuals with IBD may be at a greater risk of reporting greater stress, depression and worse general health; however, these participants are not necessarily more clinically maladjusted than individuals who are considered healthy.

5.3.2 Prediction 2: Group differences based on personal dispositions.

Personality, in particular neuroticism, has been linked to somatic complaints and illness (Grossarth-Maticek & Eysenck, 1991). A number of studies have also linked neuroticism with IBD (Gazzard et al., 1978; Robertson et al., 1989; Shefield & Carney, 1976). As a consequence, some researchers have discussed the possibility of a disease-prone personality for IBD. Robertson et al. (1989) predicted that IBD was more likely to develop in individuals with a predisposed personality. In their study, they found that N scores were more prevalent in IBD participants than in a control group. Furthermore, increased N was found in both established cases of IBD and in those prior to an IBD diagnosis. It was concluded that the personality disposition, neuroticism, is not simply the result of having this chronic condition, but is part of the premorbid personality. Based on the findings of Robertson et al. (1989), it was predicted that the IBD group would score significantly higher on the measure of neuroticism than the non-IBD group.

Contrary to the findings of Robertson et al. (1989), who indicated that neuroticism is involved in the expression of IBD; the current research failed to support this finding suggesting that there is not an IBD prone personality. It must be noted that, unlike this study, Robertson et al. (1989) did not include a carefully matched comparison group without illness. Their results must therefore be interpreted with caution. The results of this study showed that individuals with IBD did not display significantly higher levels of neuroticism (using the EPI) than those individuals without IBD. This finding reflects the claims of Eysenck (1970), who stated that “personality is inherited” or “fixed”. People are born this way, which infers that personality dispositions cannot be altered, regardless of events such as a change in health status.

Independent t-tests did reveal however, that IBD participants reported significantly higher levels of negative affect, than participants without IBD.

Negative affect (NA) reflects a general dimension of subjective distress, even in the absence of any overt stress. This disposition subsumes a broad range of aversive mood states including; anger, guilt, fearfulness and depression (Watson & Clark, 1984). The individual high in NA is more attentive to bodily changes, more apt to interpret unusual sensations as signs of illness, and more likely to worry about possible diseases (Emmons & Diener, 1985; Watson & Pennebaker, 1989). Costa and McCrae (1987) indicated however, that although there is no definite evidence that NA leads directly and causally to life-threatening disease; it may be viewed as a potent determinant of health status.

Negative emotional states are likely to occur as a consequence of any chronic and painful illness, such as IBD. When IBD presents in its active state, participants experience varied emotions and reactions. Some may feel frustrated at having to disrupt their daily routine so as to deal with the unpleasant symptoms (Mukherjee et al., 2002). Others may worry that *this time* they will require surgery. The pain and fatigue associated with the disease is also likely to reduce tolerance, making participants irritable and short tempered (Gitlin, 1991). As a consequence of these varied personal reactions to IBD, individuals may often isolate themselves during their IBD exacerbation, providing the perfect opportunity for the escalation of further negative thoughts and emotions.

The measure of NA has been found as a significant component of many self-report stress measures. Furthermore, NA is seen to correlate strongly with increased reporting of health complaints (i.e., *subjective* health complaints) (Holzer, 1998; Milsum, 1984; Selye, 1976; Watson, Clark, & Tellegen, 1988; Watson & Pennebaker, 1989). Watson and Pennebaker (1989) raise an important issue when discussing the relationship between personality correlates and health. They state that although NA is associated with *subjective* health complaints, this measure has not been consistently linked to *objective* measures of health status. It is suggested that the pattern of relationships between NA and health *complaints*, but not health *status*, may account "for much of the correlation between reported hassles and health complaints". Watson and Pennebaker (1989) concluded that NA was expected to act as a general nuisance factor in health research, "one that taps important but organically spurious variance in symptom measures". Correlations between this dimension and other subjective health measures must therefore be interpreted with caution. The increased negative affectivity found in the IBD group suggests that these participants may be more vocal about their subjective health symptoms, but it does not necessarily indicate worse health.

5.3.3 Prediction 3: Group differences based on coping - control styles.

Research has reported that as factors contributing to IBD relapse remain uncertain, it is difficult for the patient to experience the disease course as being contingent on their own behaviour. Engstrom (1991) revealed that IBD participants show higher levels of external control compared to a control group. IBD participants have also been reported to possess ineffective coping strategies when it comes to dealing with stress (van der Zaag-Loonen, 2004). Based on these findings, it was predicted that IBD participants

compared to their non-IBD counterparts would report significantly greater use of ineffective coping (as measured by non-productive coping), and significantly more external control (as measured by increased chance and powerful others health LOC scores, and decreased internal health LOC scores).

The prediction that individuals with IBD, compared to those without IBD, would utilize a significantly greater degree of ineffective coping styles and display significantly more externally oriented *health* control beliefs, was supported by the results of this research. Specifically, independent t-tests revealed that IBD participants displayed a significantly greater use of non-productive coping, significantly higher levels of chance and powerful others health LOC, and significantly less internal health LOC, than individuals without IBD.

These results are consistent with those by Gitlin (1991) and Suls and Fletcher (1985) who found that for uncontrollable stressors, such as IBD, non-productive coping strategies were preferred. Due to the unpredictability and unknown cause of this illness, active or "solution-focused" coping strategies prove futile in eliminating the experience of flare-ups. IBD participants are shown to desire a quick fix to the suffering and embarrassment of their symptoms, and therefore tend to resort to non-productive coping and placating behaviours requiring less effort and providing immediate albeit short-term relief.

This research also revealed that IBD participants displayed significantly greater external and significantly less internal *health* control beliefs, compared to participants without

IBD. This result is not surprising, as one would expect a health-compromised group to score more poorly on a *health* related measure.

Due to its unpredictable nature, IBD participants are prone to feel as though they have little, if any, internal control over their health condition (Thompson et al., 1996). IBD participants may consider that as only undetermined external forces are responsible for illness exacerbations, no personal efforts will hinder its inevitable onset. It follows then, that IBD participants may lose faith in their ability to keep their condition under control, and therefore acquire a sense of helplessness.

Individuals who possess active coping strategies and a belief in their personal control over events are expected to have enhanced persistence to deal with the ups and downs of life; including flare-ups of illnesses such as IBD. Verissimo et al. (1998) revealed that IBD participants with a tendency to actively control their emotions experienced fewer IBD symptoms. If individuals with IBD are able to develop faith in their own abilities to cope with and control their IBD symptoms, it is anticipated that they would be more inclined to persist with using effective coping-control strategies should a flare-up develop. Despite the unpredictable nature of IBD, participants should be encouraged to focus on what they can do should an exacerbation arise, rather than letting the disease control their lives.

5.4 Overview and Discussion of Results: Predictions 4 and 5

This research aimed to establish whether personality attributes provide a stronger influence on wellbeing than coping – control mechanisms. Furthermore, this research

investigated whether the coping – control strategies can exert added influence to the prediction of wellbeing, beyond that of the personal dispositions.

5.4.1 Prediction 4: Predictors of wellbeing.

As personal dispositions measure stable constructs of individual differences, it was predicted that they will provide a stronger influence on wellbeing measures than the more transitory coping-control variables. In addition, following the results of Moreno-Jimenez et al. (2007) it was predicted that the personal dispositions of neuroticism and self-esteem would be significant predictors of wellbeing, and that neuroticism will be the stronger predictor.

It is generally accepted that individuals with chronic illness are at a greater risk of decreased wellbeing than individuals without chronic illness. Research has shown however, that the degree of wellbeing varies considerably within illness groups, suggesting factors other than the condition itself are responsible for overall degree of wellbeing (Grey & Thurber, 1991; Grey et al., 1997; Pollock, 1986). Individual differences in personality, coping methods and perceived control are suggested to contribute to a participant's varying degree of wellbeing. As revealed by the findings of past research (Costa & McCrae, 1980; Drossman et al., 2000), and confirmed by the present results; personal dispositions and coping - control mechanisms are seen to predict wellbeing in participants both with and without IBD. With the view that personality is an innate and stable construct (Eysenck & Eysenck, 1964) and methods of coping and control are malleable over time; the current study further supported the

prediction that personal dispositions provide a stronger influence on wellbeing than coping – control strategies.

Although the wellbeing measures displayed significant relationships with both the personal disposition and coping – control measures for both comparison groups; the associations between personal dispositions and wellbeing domains were considerably stronger. Correlation coefficients (see Table 4.3) show generally large correlations (above $r = .50$) between personality attributes and wellbeing, while the associations between coping – control measures and wellbeing were by and large of small to medium strength (between $r = .1$ to $r = .4$) (Cohen, 1998). As this pattern of results illustrate, personal dispositions are seen to display a stronger relationship with wellbeing than methods of coping or personal control beliefs – regardless of an individual's health status.

Multivariate regression procedures further attest to this finding. Together, the included personality dispositions were able to predict between 52% and 58% of the variance in wellbeing. The coping – control mechanisms were only able to predict between 26% and 48% of the variance in wellbeing. These results provide further support to the prediction that personality characteristics - due to their assumed stability within the individual - provide a stronger prediction of wellbeing, compared to coping ability and control beliefs.

Unlike the findings of Morino-Jiminez (2007), who demonstrated that neuroticism, and to a lesser extent self-esteem, were the strongest predictors of wellbeing, the results of this study illustrated negative affect as the strongest wellbeing predictor. This pattern of

findings was identified for both the IBD and non-IBD groups suggesting that, irrespective of health status, personal dispositions, in particular NA, are potent determinants of wellbeing.

5.4.2 Research question: Coping-control predictors as added value for predicting wellbeing.

Coping – control variables have been implicated as potentially adding to the prediction of wellbeing, over and above that of personal dispositions. This is important for remediation purposes as coping – control variables can be modified, while the dispositional factors are regarded as relatively immutable. This research explored whether coping – control variables provided any 'added value' in predicting wellbeing beyond that accounted for by the included personal dispositions alone.

Research has shown that ineffective coping such as wishful thinking and avoidance strategies may have the ability to relieve short-term stress, but they do not modify or improve perceptions of health or wellbeing (Grey et al., 1997; Suls & Fletcher, 1985). Conversely, effective coping methods such as: problem solving, sharing thoughts and feelings, and possessing a perceived ability to control these emotions, do have a bolstering effect on wellbeing (Helgeson, 1992; Smolen & Topp, 1988). Individuals who utilize effective coping methods are seen to be more amenable to teaching and treatment adherence, which is in turn likely to increase adaptation to illness, improve quality of life and consequently boost wellbeing (Lazuras & Folkman, 1984). Smolen and Topp (1988) strongly recommended that practitioners intervene to enhance effective coping strategies, as they are seen to facilitate increased health perceptions and

wellbeing among sufferers of IBD. Turnbull and Vallis (1995) identified that IBD participants who practiced "good" coping, experienced significantly less psychological distress than those with "poor" coping skills. The results of this research supported this finding for both IBD participants and healthy comparisons. That is, effective coping and perceived emotional control was significantly correlated with increased wellbeing, irrespective of health status.

Personal dispositions are the core, innate and stable factors which contribute to the way an individual processes stress (Eysenck & Eysenck, 1964); while coping-control mechanisms are transient and modifiable factors which differ depending on the type and duration of stress experienced (Lazuras & Folkman, 1984). Although personal dispositions have been shown to exert a stronger influence on wellbeing than coping-control mechanisms, the results of this research showed that the predictive power of the coping – control mechanisms, in particular perceived emotional control, was sufficient to warrant a moderate influence on wellbeing over and above the personality dispositions. This finding is worthy of further investigation as it is important for remediation purposes.

5.5 Discussion of Minor Predictions

5.5.1 Minor prediction 1.

Approximately 75% of participants with CD will require surgery at some point during the course of their illness, while only 40% of UC participants will require this course of action (Langholtz et al., 1997). Schwarz (1989) reported that CD participants displayed

higher anxiety, psychological distress and symptom severity than participants with UC. Futhermore, Casellas and colleagues (2000) identified that active CD impairs participants HRQOL significantly more than active UC. With these findings in mind, a prediction of this research was that participants with CD, compared to UC, will report higher mean scores on the measures of general health complaints, perceived stress and depression, and lower IBD Adjustment scores.

Despite reports that CD is a more debilitating illness than UC - with regards to a greater likelihood of requiring surgery and an inability to cure the condition - the results of this research did not support the prediction that, in comparison to UC, CD participants would report poorer wellbeing. Regardless of the categorization of the illness; both UC and CD participants experience comparable symptoms. As the symptoms between these two IBD groups are essentially indistinguishable, it is suggested that both groups will experience a similar level of wellbeing.

5.5.2 Minor prediction 2.

Many reports have suggested significant associations between poor wellbeing and increased IBD severity (Casellas et al., 2000; Cunningham et al., 2007; Guthrie et al., 2002; Larsson et al., 2008; Thirlby et al., 1998; van der Zaag-Loonen et al., 2004). Other reports in the literature could not identify an association between severity and adjustment/wellbeing (Gazzard et al., 1978; Turnbull & Vallis, 1995). Although, Turnbull and Vallis (1995) illustrated that when IBD activity was combined with poor coping and psychosocial distress, this combination of factors predicted poor wellbeing.

It is predicted that IBD participants classed as more severe, compared to those with mild IBD, will report higher scores on the wellbeing measures of general health complaints, perceived stress and depression and lower IBD Adjustment scores.

The results of this research were unable to support the prediction that participants with severe IBD would exhibit poorer wellbeing, than those participants with mild IBD. The variable "illness severity" was based on the number of flare-ups experienced. IBD participants who reported having more than three flare-ups (severe IBD) did not indicate poorer wellbeing than those reporting only one or two flare-ups of their illness (mild IBD). Perhaps counting flare-ups was too simplistic a method to classify illness severity. A more sophisticated and objective indicator of severity may be required. Objective indicators of severity may include: number and frequency of bowel motions, bleeding and level of pain.

5.5.3 Minor prediction 3.

With the use of a questionnaire, Morris et al. (2001) established that the rates of IBD were twice as high in left-handers as in right-handers. This study predicts that there will be an increased proportion of left-handed IBD participants, compared to left-handed individuals without IBD.

Although only a small sample size was gathered, the results of this research did not show any evidence that the proportions of left-handed IBD participants were greater than left-handed non-IBD's. This finding casts doubt on the relationship between

handedness and auto-immune disease as found by Geschwind and Behan (1984) and indicated that further research is required in this domain.

5.6 Summary and Overview of Results

Coping with stress in relation to chronic illness remains a central issue in health psychology. Ulcerative colitis (UC) and Crohn's disease (CD) are two forms of chronic intestinal malfunction known collectively as inflammatory bowel disease (IBD). Recent estimates (Molodecky, 2012) indicate that more than 80,000 individuals are affected by IBD in Australia and 1,500,000 in North America. Its prevalence is increasing, particularly in industrialized nations and the disease appears to affect females and males equally. Since Lazarus' pioneering work on coping strategies, psychologists have been interested in how people adapt to chronic health issues, and in turn, how their coping efforts affect psychological wellbeing. Many recent reports have suggested that personal characteristics including personality dispositions and coping strategies affect adjustment to illness in general and IBD in particular. The majority of studies reviewed however are of questionable design, lack a theoretical framework, and fail to incorporate matched comparison groups. The present dissertation is unique in several ways. Specifically, predictions for the current study were based on a logically deduced theoretical framework and included a pool of common, psychometrically validated measures of *both* positively and negatively worded questionnaires. It also included a number of outcome measures (GHQ, PSS and BDI – in addition to an illness-specific wellbeing measure – IBD adjustment), rather than a sole outcome measure noted in previous research (e.g., McLean et al., 2004 used GHQ as a sole outcome measure. All major

hypotheses generated from the model were systematically tested using groups balanced for IBD type, severity of illness, age, sex and, importantly, a comparison group.

The present study developed a cohesive framework in order to clarify the interrelations between the variables used within this research. It investigated how individuals deal with stress, how personality and coping measures may influence wellbeing and whether these factors differ between individuals with or without chronic illness; specifically IBD. It was predicted that IBD volunteers, compared to non-IBD comparisons would exhibit lower scores on the measures of wellbeing. Personal dispositions and coping-control mechanisms were also expected to differ between the comparison groups. It was predicted that personality would provide a stronger influence on wellbeing, compared to the more transitory coping-control measures. Coping-control mechanisms were also assessed as to whether they would significantly contribute to wellbeing, over and above the personality domains.

The IBD group, compared to the non-IBD comparisons, reported poorer scores on all measures of wellbeing. This can be explained by the fact that the IBD group must deal with the added stress of having a chronic illness, in addition to everyday stressors. Despite IBD participants displaying significantly lower wellbeing scores than the comparison group, these scores are not considered low enough to fall within the clinical range of maladjustment. Results also indicated that the comparison groups were largely indistinguishable, based on the majority of measures pertaining to personal disposition and coping-control mechanisms. Of the few differences that did emerge between the two groups (i.e., NA and health related LOC), it was reasoned that as these measures incorporated a large “sickness” component, it was not surprising that the health

compromised group – IBD participants – scored differently on these measures. In contrast to the results of past literature (e.g., Robertson et al., 1989) these results suggest that there is no specific IBD-prone personality type and no distinct way that people with IBD deal with stress. The results indicate that the variables predicting wellbeing for both the IBD and non-IBD groups are essentially the same. As a consequence, the groups were combined and treated as a whole. With regards to general wellbeing predictors, negative affect was identified as the strongest personality predictor and PCOIS as the strongest coping-control predictor. Overall, the group of personal dispositions provided a stronger influence on wellbeing compared to the group of coping-control variables. Moreover, when investigating the combined effects of personality and coping-control as predictors of wellbeing, the coping-control mechanisms only moderately influenced wellbeing, over and above the personal disposition measures. This finding suggests that although coping strategies and control mechanisms may contribute to wellbeing; their influence is no match for the innate and stable personality constructs.

5.7 Methodological Issues and Future research

Although this research is part of an ongoing effort which contributes to our understanding of factors associated with wellbeing and IBD adjustment, consideration must be given to its limitations.

One limitation of this study is the small sample sizes of the IBD comparison groups, which thereby limits generalisation to the wider community of IBD participants. Furthermore, this research only utilized IBD volunteers who had made contact with a

medical specialist. Not all individuals with IBD consult with a doctor for regular check-ups. It is unknown whether these participants have differing personal characteristics than those who do not maintain regular medical contact. As these individuals were not assessed, the present findings can only be generalized to those participants who maintain routine medical contact. Future research may combat this problem by recruiting participants from multiple sources, such as IBD support groups. In addition, future studies should include other illness groups and employ a sample of children/adolescents. Such efforts would ascertain whether the present findings can be generalized to the wider population.

The correlational design of this study implies association between variables, but cannot infer causal relationships. This type of design also represents a "snapshot" at a particular point in time, and does not assume that the relations are stable over time. With the use of a longitudinal design, the causal direction and stability of this study's findings can be addressed. If a longitudinal design is to be used, a team commitment and research grants would be required. Furthermore, the cross-sectional design – which gathers information from participants at a particular point in time – does not reflect that IBD is characterised by flare-ups and remissions.

As it is unlikely that an IBD participant would complete a questionnaire during a flare-up, it is assumed that the IBD respondents involved within this study were in remission. A participant's judgment of their wellbeing, use of coping strategies and perceptions of control may vary markedly depending on the state of their disease (i.e., active or remission). So as to clarify these results, future research will need to distinguish between those participants in remission from those experiencing a flare-up..

With regards to the definition of “a flare-up”, future research is encouraged to define this status more specifically so that a consistent measure can be achieved. Some participants may believe that stomach aches, bloody stool or an increase of their medication constitutes a flare-up. Other participants may only acknowledge a flare-up when admitted to hospital. That is, what are considered minor symptoms for some participants may be considered major flare-ups for others.

A further methodological issue concerns the self-report measures utilized as part of this study. The subjective nature of these measures may have failed to elicit entirely accurate responses. For example, participants may have reported feeling less healthy or more stressed than was objectively the case. It is recommended that objective measures be incorporated in order to gain the most accurate responses. Some methods of obtaining information of a participant’s objective health status may include: the use of additional informants such as family members/spouse; recent medical tests; a doctor’s view of the patient; or absenteeism rates. In addition, to obtain an objective measure of a participant’s level of stress, future studies may benefit from a more elaborate and precise interview measure, such as the Life Events and Difficulties Schedule (Brown & Harris, 1989), or the Life Events/Social Readjustment Rating Scale (Holmes & Rahe, 1967).

Many of the items on the general health, perceived stress and personality scales display a large overlap in content. For example, item 14. on the General Health scale read "*Have you recently been feeling nervous and strung up all the time?*", item 17. on the Eysenck Personality Inventory read "*Do you suffer from nerves?*", and item 3. on the

Perceived Stress scale read "*How often have you felt nervous and 'stressed'?*". Due to the high similarity observed among many items on the questionnaire, spuriously high correlations may have been produced. Perhaps with the use of more distinct measures relating to each domain, future research may obtain more reliable and conclusive results.

The current study did not differentiate between “positive” stress and “negative” stress experiences. “Positive” stress contributes to excitement and productivity, ensuring that individuals keep to schedule; while “negative” stress arises when there is a poor fit between the individual’s ability to cope and the demands being made upon them (Wilkie, 1995). It remains unclear as to whether individuals who experience “positive” stress consider themselves as being stressed, or whether it is restricted purely to the experience of “negative” stress. As stress is a subjective experience however, differentiation between positive and negative stress would prove a difficult task. What is classified as negatively stressful for one individual may contribute to a positive "adrenaline high" for another. Future research may aim to establish the characteristics of individuals who are more inclined to experience “positive” stress. Perhaps, individuals who possess increased positive emotions and who are inclined to report better general health, may also perceive greater “positive” stress.

Much information can be gained from conducting between-group research. With the use of randomized sampling procedures, group strategies eliminate any potential threats to internal validity (treatment efficacy) and provide greater external validity (treatment effectiveness). Group studies also provide standardized rules and conventions for hypothesis testing. Limitations are encountered however, when using group

methodologies. A well-established pitfall of between-group methods is that a group's average performance can change, when only a minority of participants respond in a certain way. Furthermore, as between group research only examines the average responses of a group, any individual differences are masked by the averaging of results (Molloy, Murphy, & King, 2007).

Another notable disadvantage of the group-based approach is the difficulty in generalizing a group or averaged result to an individual (Barlow & Nock, 2009). The majority of participants used as part of group research are recruited from hospital, university or laboratory settings. This places limits on the external validity of findings, and makes the results less representative of the general population. It has been noted that clinicians often question the applicability of generalizing the results of group methodologies to individuals in clinical settings (Molloy, Murphy, & King, 2007). To complement the advantages of between group designs – with its comparison groups – future research should consider adding single-case (or ideographic) methodologies. The use of qualitative, single-case designs – which focus on the intensive study of the individual – avoids many of the issues involved in between-group research. Single-case (or n=1) methodologies can require minimal time, few resources and participants; and they are useful in providing strong evidence of causal relations between variables. Although both between-group and single-case studies have advantages and disadvantages, it is suggested that both methodologies are of value and should be viewed as complimentary. General patterns of findings can be identified with the use of between-group analyses; these results may then be fine-tuned with the use of single-case research (i.e., applying interview techniques or using personal stress diaries) to determine the source of inter-participant variability and the isolating factors responsible

for that variability. The single-case method will further assist clinicians with evaluating individual needs in order to design interventions that can be targeted to each case.

5.8 Implications for Psychological Theory and Practice

The fundamental aim of health research involving chronic illness is to provide individuals with strategies and treatment options that may facilitate actual and perceived improvements of physical and psychological wellbeing. Logically, before attempting to design such management plans, it is necessary to determine the contributing factors of wellbeing. The current study developed a "Conceptual Framework of Adjustment to Chronic Illness", which clarifies the interrelations between stress, personality and coping; and provides a means of identifying the influence of these factors on wellbeing. This framework can be incorporated and tested in future studies, as a means of assisting researchers in identifying factors associated with varying degrees of wellbeing experienced by those faced with life stress, and varied types of chronic illness.

As the framework of this research emphasizes, chronic illness is classified as an *added* source of stress, which contributes significantly to the experience of wellbeing. Individuals with IBD can be helped to minimize the stress associated with their chronic illness by teaching them how to effectively deal with it by altering their perceptions. It is recommended that various interventions be implemented as part of a multifaceted approach to chronic illness. These include stress management, relaxation and group or individual therapy. Techniques such as thought stopping and positive thinking are also recommended as a way forward.

It is proposed that the management of chronic illness will not be successful if *only* the disease itself is addressed. Data gained from this group research established valuable information involving differences between "sick" and "healthy" individuals, and how these inter- and intra-personal differences contribute to wellbeing. As established within this research, negative personal dispositions play an integral role in predicting wellbeing. Perceived control of emotional states, although a less potent wellbeing contributor, also emerged as an important influence on wellbeing. These findings highlight the need for interventions which are aimed at promoting wellbeing, to not only focus on reducing negative personal attributes, but also to facilitate modifiable factors such as adaptive personal control beliefs.

5.9 Conclusion

In summary, this research failed to provide evidence of an IBD-prone personality, as was previously suggested (Robertson et al., 1989). It was identified that the measures of personal dispositions and coping-control mechanisms were *essentially* the same for both the IBD and non-IBD comparison groups. As stipulated by the framework, IBD participants possessed an added, identifiable source of stress, that being their illness. It was not surprising therefore that this group reported significantly worse wellbeing scores, compared to the "healthy" comparison group. Although the IBD group scored significantly lower on the selected wellbeing measures, it is emphasized that neither comparison group scored low enough to warrant classification within the clinical range of maladjustment. It is suggested therefore that individuals with IBD are not distinct from those without IBD. Some individuals cope with stress better than others, and this is independent of having a chronic illness (IBD). The results of this study also suggest

that individuals display better wellbeing when they report less negative emotions (NA) and perceived greater control of their internal thoughts, feelings and emotions (PCOIS). Overall, personality domains are regarded as the strongest influence on wellbeing due to their inherent and stable nature. Coping strategies and internal control mechanisms may play an important role in influencing wellbeing under certain stressful conditions, but it is the individual's innate personality make-up that is seen to override these other more transient influences. This thesis concludes with the argument that between-group comparisons are not very helpful in identifying differences in predicting psychological wellbeing between the "well" and the "sick". In other words, group studies by their nature cannot identify individual differences as they are lost in group averages. It is suggested that idiographic or *n*=1 studies are likely to prove a more fruitful method of understanding relations between chronic illness and wellbeing.

The completion of this research has generated new data in the field of IBD, personality, coping and wellbeing. A search within all relevant databases revealed limited research in this area. The scarcity of recent research reports involving these key terms is illustrated by having conducted a search for articles using the PsycINFO and MEDLINE databases "Year 2000 to present". Using the search term "Inflammatory Bowel Disease" combined with "personality", "coping", "wellbeing" or "psychological adjustment" only a handful of entries emerged. Moreover these research studies lacked a theoretical basis, failed to provide a guiding conceptual framework and were poorly designed – often not involving healthy, matched comparison groups. Although this study has its own inherent limitations, it nonetheless adds to the small body of research in this area and provides opportunities for further research and refinement.

5.10 Chapter Summary

This chapter reviewed the results of the data analyses reported in the previous chapter and discussed these findings along with their implications for the wider population. Following the preliminary analyses, each of the research predictions were restated and discussed separately. The chapter concluded with a discussion of some limitations of the study and proposals for future research directions.

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Appendices

Appendix A: Purpose and Requirements of the Research

Project Title: Psychological Predictors of Wellbeing: A Comparison of IBD and non-IBD respondents.

My name is Bianca Holzer and I am undertaking my research under the supervision of Geoffrey N Molloy (Associate Professor, Institute of Human Development and Counselling, Faculty of Education) towards a PhD in Psychology at Monash University.

Inflammatory Bowel Disease (IBD) is a term relating to two related diseases of the gastrointestinal tract, ulcerative colitis and Crohn's disease. Currently there is no known cause or cure for these diseases. However, it is the aim of this research project to identify various strategies which may assist sufferers to better cope with their condition, and factors which may contribute to better adjustment to living with their disease. It is anticipated that through this research, improved psychological management strategies for IBD sufferers can be developed.

I am seeking individuals over 18 years of age who have either Crohn's disease or ulcerative colitis to take part in this research. I am also seeking individuals who do not experience either of these conditions, or any other chronic illness, to act as a comparison group. Participants are asked to answer the attached questionnaire in their own time. It is expected to take approximately 30 minutes to complete.

No findings which could identify any individual participant will be published. The anonymity of your participation is assured by our procedure, in which you are not asked to provide your name on the questionnaire. Only my supervisor and I will have access to this data, which will be stored for five years as prescribed by the University regulations.

Participation is this research is entirely voluntary. If you agree to take part, you may withdraw at any time by not returning the questionnaire. If you feel any distress of discomfort due to any questions you may just skip them, or alternatively you may wish to contact either myself or my supervisor, Geoffrey Molloy.

Furthermore, if you have any queries or would like to be informed of the aggregate research findings, please contact Geoffrey Molloy or myself on [redacted]

Should you have any complaint concerning the manner in which this research (project number 2003/109) is conducted, please do not hesitate to contact:

The Secretary
The Standing Committee on Ethics in Research on Humans
Monash University
Wellington Road
Clayton, Victoria 3168
[redacted] [redacted]

Thank you,

Bianca Holzer BSc, GradDip(Ed)Psych, MPsych
Registered Psychologist

Appendix B: Questionnaire

Contained within this booklet are a number of short questionnaires designed to obtain an overview of how you view the world around you. Please do not spend too long on any one question. There are no right or wrong answers, just select the option that is most true for you.

Thank you kindly for your assistance in this research.

General Information

Tick, write or circle the answer where appropriate

1. Gender: ☐ Male ☐ Female

2. Age (in years):_____

3. In your family were you born:
only child 1st 2nd 3rd 4th 5th 6th 7th _____ ?

4. Handedness: ☐ Right ☐ Left

5. Occupation: _____

6. Do you have a medical condition or chronic illness?
☐ Yes (Please specify) _____ ☐ No

7. What is your major source of stress?
(If more than one answer is chosen; please rate with 1 being most important)
☐ family/home-life ☐ study/work ☐ health/illness
☐ friends ☐ future/the "unknown" ☐ relationships
☐ death ☐ nothing causes me stress ☐ money/finance
☐ other_____

8. How do you usually deal with stress?
(If more than one answer is chosen; please rate with 1 being most important)
☐ exercise ☐ talk about it ☐ eat
☐ take relaxant medication ☐ drink alcohol ☐ take drugs
☐ smoke ☐ relax (bath/TV/read etc.) ☐ socialize
☐ ignore the issue ☐ avoid the situation ☐ plan a solution
☐ other _____

9. Do you feel that you are prone to illness/getting sick?
☐ Yes ☐ No

10. How often do you consult a medical professional (doctor/GP/specialist)?
☐ the moment I notice something different
☐ regularly
☐ only when necessary
☐ never

11. How would you rate your overall health at present?
☐ very good ☐ good ☐ bad ☐ very bad

General Information – *IBD respondents only*

1. What condition do you have?
☐ Crohn's Disease ☐ Ulcerative Colitis
☐ Other (please specify) _____

2. At what age did you experience your first "flare-up"? _____

3. How many major "flare-ups" have you had (including initial onset)?
☐ 1 ☐ 2 ☐ 3 ☐ 4 or more

4. What do you feel contributed to these "flare-ups" most of all?
(If more than one answer is chosen; please rate with 1 being most important)
☐ stress ☐ diet ☐ nothing ☐ other _____

5. How long has it been since your last "flare-up"? _____

6. Have you been admitted to hospital due to your condition? ☐ Yes ☐ No
If **Yes**, how long was your stay? _____

7. Have you undergone any surgery due to your condition? ☐ Yes ☐ No
If **Yes**, what did you have done? _____
Do you feel this has helped your condition? ☐ Yes ☐ No

8. Are you taking medication for your condition? ☐ Yes ☐ No
If **Yes**, do you take them *strictly* as prescribed? ☐ Yes ☐ No

9. How would you rate the level of knowledge you possess about your condition?
1-------2-------3-------4-------5-------6
Little or no knowledge All knowledge possible

10. Are you satisfied with the amount of information you have about your condition? ☐ Yes ☐ No

11. If you experience symptoms of your condition, what do you do?
(If more than one answer is chosen; please rate with 1 being most important)
☐ try to relax (have bath/read/watch TV etc.) ☐ call the doctor
☐ self-medicate *(ie. ☐ painkillers ☐ relaxants ☐ other _____)*
☐ ignore the symptoms and hope they pass ☐ other _____

12. What aspect of your life has been MOST affected by your condition?
(Please tick most affected)
☐ social ☐ family ☐ relationships ☐ leisure/hobbies
☐ professional ☐ personal outlook/beliefs ☐ other _____

13. Do you feel that your condition has affected your life
☐ positively?,
☐ negatively?, or
☐ not at all?.

Experience related to IBD (IBD Adjustment)

Olbrisch, ME., & Ziegler, SW. (1982b). Psychological adjustment and patient information in inflammatory bowel disease: development of two assessment instruments. *Journal of chronic disease*, **35**, 649-658.

For those individuals with IBD, here is a list of statements concerning your illness. Please circle the number that best represents the way you feel about the following statements.

		Very Frequently						Never
1	When someone asks you about you disease, do you give it a more 'socially acceptable' label?	1	2	3	4	5	6	7
2	When your disease is acting up and you are making frequent trips to the bathroom, do you make up excuses for these trips?	1	2	3	4	5	6	7
3	If you're invited to a dinner which you find you can't eat because of your disease, would you politely refuse and explain the nature of the problem?	1	2	3	4	5	6	7
4	How often do you respond to a flare-up of your disease by becoming depressed?	1	2	3	4	5	6	7
5	How often do you do things that are likely to cause a flare-up even though you're aware of the consequences?	1	2	3	4	5	6	7
6	Do you find yourself resenting your friends without chronic illness?	1	2	3	4	5	6	7
7	Have you ever considered suicide primarily because of your disease?	1	2	3	4	5	6	7
8	When you are ill and unable to maintain your normal physical routine, do you find substitute activities that you are capable of to keep you busy and productive?	1	2	3	4	5	6	7
9	Are you able to laugh afterwards about some of the awkward situations arising from your disease?	1	2	3	4	5	6	7
10	Does your disease cause you to restrict your sexual activity?	1	2	3	4	5	6	7
11	How often do you think about the increased risk of cancer that accompanies some forms of IBD?	1	2	3	4	5	6	7
12	If you were to have long-standing plans with someone and your disease flared-up, would you cancel with an honest explanation?	1	2	3	4	5	6	7
13	Are you reluctant to plan anything far in advance because you might not feel up to it when the time comes?	1	2	3	4	5	6	7
14	Does separation from your doctor because of a trip (on your part or his/hers) make you anxious?	1	2	3	4	5	6	7
15	Do you speak frankly with your doctor about even the most embarrassing aspects of your illness?	1	2	3	4	5	6	7

		Very Frequently						Never
16	Are you reluctant to go somewhere when you are not already familiar with the bathroom arrangement?	1	2	3	4	5	6	7
17	Do you avoid telling your doctor about changes in symptoms?	1	2	3	4	5	6	7
18	Does your disease make you feel less physically attractive?	1	2	3	4	5	6	7
19	When a good friend who's acquainted with your condition asks you how you're feeling, do you attempt to answer honestly?	1	2	3	4	5	6	7
20	Do you feel like a pest or complainer when you have to contact your doctor frequently about not feeling well?	1	2	3	4	5	6	7
21	Would you leave a place early rather than produce possibly embarrassing odours by using the bathroom there?	1	2	3	4	5	6	7
22	How often are you able to forget about your disease?	1	2	3	4	5	6	7
23	How often would you say you get depressed over the realization that you are going to have this disease for the rest of your life?	1	2	3	4	5	6	7

		Strongly Agree						Strongly Disagree
24	I find that I unnecessarily restrict the range of my activities because of my disease.	1	2	3	4	5	6	7
25	I think that my self-respect has suffered because of my disease.	1	2	3	4	5	6	7
26	I feel that I am somehow being punished for something by having this disease.	1	2	3	4	5	6	7
27	I think I am living quite a normal life despite my illness.	1	2	3	4	5	6	7
28	I feel somehow 'dirty' and 'unclean' because of the disease I have.	1	2	3	4	5	6	7
29	I feel ashamed of my disease as if it were something I contracted because of my own physical or emotional weakness.	1	2	3	4	5	6	7
30	I intend to lead a productive and fulfilling life despite my illness.	1	2	3	4	5	6	7

LOT-R Scheier, MF., Carver, CS. & Bridges, MW. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, **67**, 1063-1078.

Please read through the following statements and decide how much you Agree or Disagree with each. Circle the number, from 1 to 5, that best indicates how you feel.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	In uncertain times I usually expect the best	1	2	3	4	5
2	If something can go wrong for me it will	1	2	3	4	5
3	I'm always optimistic about my future	1	2	3	4	5
4	I hardly ever expect things to go my way	1	2	3	4	5
5	Overall I expect more good things to happen to me than bad	1	2	3	4	5
6	I rarely count on good things happening to me	1	2	3	4	5

PANAS Watson, D., Clark, L. A. & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology*, **54**, 1063-1070.

This scale consists of a number of words that describe different feelings and emotions. Read each item and then write the appropriate number (1 to 5) in the space next to each word. Indicate to what extent you have felt this way during the past few weeks.

1 Very slightly or not at all	**2** A little	**3** Moderately	**4** Quite a bit	**5** Extremely

1	_____	interested	**11**	_____	irritable
2	_____	distressed	**12**	_____	alert
3	_____	excited	**13**	_____	ashamed
4	_____	upset	**14**	_____	inspired
5	_____	strong	**15**	_____	nervous
6	_____	guilty	**16**	_____	determined
7	_____	scared	**17**	_____	attentive
8	_____	hostile	**18**	_____	jittery
9	_____	enthusiastic	**19**	_____	active
10	_____	proud	**20**	_____	afraid

Coping Scale for Adults (CSA) Frydenberg, E. & Lewis, R (1997). *The Coping Scale for Adults*. ACER:Vic.
Below is a list of ways in which people cope with a wide variety of concerns or problems. Please indicate the things you do to deal with your concerns or worries by circling the appropriate number.

When I am worried / concerned about something I …

	Active coping **Non-productive coping**	Doesn't apply or don't do it	Used very little	Used sometimes	Used Often	Used a great deal
1	Play sport	1	2	3	4	5
2	Talk to others and give each other support	1	2	3	4	5
3	Put effort into my work	1	2	3	4	5
4	Pray for help and guidance so that everything will be alright	1	2	3	4	5
5	I get sick; for example headache, stomach ache	1	2	3	4	5
6	Work on my self-image	1	2	3	4	5
7	Look on the bright side of things and think of all that is good	1	2	3	4	5
8	Develop a plan of action	1	2	3	4	5
9	Try to be funny	1	2	3	4	5
10	Find a way to let off steam; eg. cry, scream, drink, take drugs	1	2	3	4	5
11	Improve my relationship with others	1	2	3	4	5
12	Go to meetings which look at the problem	1	2	3	4	5
13	Daydream about how things will turn out well	1	2	3	4	5
14	Blame myself	1	2	3	4	5
15	Don't let others know how I am feeling	1	2	3	4	5
16	Consciously 'block out' the problem	1	2	3	4	5
17	Ask a professional person for help	1	2	3	4	5
18	Worry about what will happen to me	1	2	3	4	5
19	Make time for leisure activities	1	2	3	4	5
20	List any other things you do to cope with your concern/s					

MHLOC Wallston, K., Wallston, B.S. & DeVellis, R (1978). Development of the Multidimensional Health Locus of Control (MHLC) scales, *Health Education Monographs*, **6**, 161-170.

For each item, circle the number that represents the extent to which you agree or disagree with the statement. This is a measure of your personal beliefs, so naturally there are no right or wrong answers.

	Internal LOC Chance LOC Powerful others LOC	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
1	If I get sick, it is my own behaviour which determines how soon I get well again	1	2	3	4	5	6
2	No matter what I do, if I am going to get sick, I will get sick	1	2	3	4	5	6
3	Having regular contact with my doctor is the best way for me to avoid illness	1	2	3	4	5	6
4	Most things that affect my health happen to me by accident	1	2	3	4	5	6
5	Whenever I don't feel well, I should consult a medically trained professional	1	2	3	4	5	6
6	I am in control of my health	1	2	3	4	5	6
7	My family has a lot to do with my becoming sick, or staying healthy	1	2	3	4	5	6
8	When I get sick I am to blame	1	2	3	4	5	6
9	Luck plays a big part in determining how soon I will recover from an illness	1	2	3	4	5	6
10	Health professionals control my health	1	2	3	4	5	6
11	My good health is largely a matter of good fortune	1	2	3	4	5	6
12	The main thing which affects my health is what I myself do	1	2	3	4	5	6
13	If I take care of myself, I can avoid illness	1	2	3	4	5	6
14	When I recover from an illness, it's usually because other people (eg. doctors, family) have been taking good care of me	1	2	3	4	5	6
15	No matter what I do, I'm likely to get sick	1	2	3	4	5	6
16	If it's meant to be, I will stay healthy	1	2	3	4	5	6
17	If I take the right actions, I can stay healthy	1	2	3	4	5	6
18	Regarding my health, I can only do what my doctor tells me to do	1	2	3	4	5	6

PCOISS Pallant, J. F. (2000). Development and Validation of a Scale to Measure Perceived Control of Internal States. *Journal of Personality Assessment*, **75**, 308-337.

Using the scale provided, decide how much you either disagree or agree with each of the following statements. Circle the number from 1 to 5 that best indicates how you feel.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I don't have much control over my emotional reactions to stressful situations.	1	2	3	4	5
2	When I'm in a bad mood I find it hard to snap myself out of it.	1	2	3	4	5
3	My feelings are usually fairly stable	1	2	3	4	5
4	I can usually talk myself out of feeling bad	1	2	3	4	5
5	No matter what happens to me in my life I am confident of my ability to cope emotionally	1	2	3	4	5
6	I have a number of good techniques that will help me cope with any stressful situation	1	2	3	4	5
7	I find it hard to stop myself from thinking about my problems.	1	2	3	4	5
8	If I start to worry about something I can usually distract myself and think about something nicer	1	2	3	4	5
9	If I realise I am thinking silly thoughts I can usually stop myself	1	2	3	4	5
10	I am usually able to keep my thoughts under control	1	2	3	4	5
11	I imagine there will be many situations in the future where silly thoughts will get the better of me.	1	2	3	4	5
12	I have a number of techniques which I am confident will help me think clearly and rationally in any situation I might find myself	1	2	3	4	5
13	Even when under pressure I can usually keep calm and relaxed	1	2	3	4	5
14	I have a number of techniques or tricks that I use to stay relaxed in stressful situations	1	2	3	4	5
15	When I'm anxious or uptight there does not seem to be much that I can do to help myself relax.	1	2	3	4	5
16	There is not much I can do to relax when I get uptight.	1	2	3	4	5
17	I have a number of ways of relaxing that I am confident will help me cope	1	2	3	4	5
18	If my stress levels get too high I know there are things I can do to help myself	1	2	3	4	5

EPI -Neuroticism Eysenck, H. J. & Eysenck, SBG. (1964). *Eysenck Personaluity Inventory*. San Diego, CA. Educational and Industrial Teaching Service.

Please indicate the extent to which you either Agree or Disagree with the following questions by circling the appropriate number (1 to 4).

		Strongly Disagree	Disagree	Agree	Strongly Agree
1	Have you often got a restless feeling that you want something but do not know what?	1	2	3	4
2	Do you sometimes feel happy, sometimes sad, without any real reason?	1	2	3	4
3	Do you sometimes sulk?	1	2	3	4
4	Are you moody?	1	2	3	4
5	Have you often lost sleep over your worries?	1	2	3	4
6	Do you often make up your mind too late?	1	2	3	4
7	Have you often felt listless and tired for no good reason?	1	2	3	4
8	Do you often feel 'fed up'?	1	2	3	4
9	Does your mind often wonder when you are trying to attend closely to something?	1	2	3	4
10	Are you often lost in thought?	1	2	3	4
11	Do you often think of your past?	1	2	3	4
12	When you get annoyed, do you need someone friendly to talk about it with?	1	2	3	4
13	Are you touchy about some things?	1	2	3	4
14	Do you sometimes get so restless that you cannot sit long in a chair?	1	2	3	4
15	Do you have dizzy turns?	1	2	3	4
16	Do you ever get short of breath without having done heavy work?	1	2	3	4
17	Do you suffer from nerves?	1	2	3	4
18	Do you get nervous in places like lifts, trains or tunnels?	1	2	3	4
19	Do you get very bad headaches?	1	2	3	4
20	Do you find it hard to get to sleep at night?	1	2	3	4
21	Do you worry to long after an embarrassing experience?	1	2	3	4
22	Do you often get into a jam because you do things without thinking?	1	2	3	4
23	Do you often feel self-conscious when you are with superiors?	1	2	3	4
24	Do you often get 'butterflies in your stomach' before an important occasion?	1	2	3	4

Generalized Self-Efficacy Scale Schwarzer, R. & Jerusalem, M. (1993). Measurement of perceived self-efficacy: Psychometric scales for cross-cultural research. Berlin: Frie Universitat.

The following two groups of statements concern general feelings about yourself. Please indicate the extent to which you either Agree or Disagree with each, by circling the appropriate number.

		Strongly Agree	Agree	Disagree	Strongly Disagree
1	I can always manage to solve difficult problems if I try hard enough	1	2	3	4
2	If someone opposes me, I can find means and ways to get what I want	1	2	3	4
3	It is easy for me to stick to my aims and accomplish my goals	1	2	3	4
4	I am confident that I could deal efficiently with unexpected events	1	2	3	4
5	Thanks to my resourcefulness, I know how to handle unforeseen situations	1	2	3	4
6	I can solve most problems if I invest the necessary effort	1	2	3	4
7	I can remain calm when facing difficulties because I can rely on my coping abilities	1	2	3	4
8	When I am confronted with a problem, I can usually find several solutions	1	2	3	4
9	If I am in a bind I can usually think of something to do	1	2	3	4
10	No matter what comes my way, I'm usually able to handle it	1	2	3	4

Rosenberg Self-Esteem Scale Rosenberg, M. (1989). Society and the Adolescent Self-Image (reprint edition). Middletown, CT. Wesleyan University Press.

		Strongly Agree	Agree	Disagree	Strongly Disagree
1	On the whole, I am satisfied with myself	1	2	3	4
2	At times I think I am no good at all	1	2	3	4
3	I feel that I have a number of good qualities	1	2	3	4
4	I am able to do things as well as most other people	1	2	3	4
5	I feel I do not have much to be proud of	1	2	3	4
6	I certainly feel useless at times	1	2	3	4
7	I feel that I'm a person of worth, at least on an equal plane with others	1	2	3	4
8	I wish I could have more respect for myself	1	2	3	4
9	All in all, I am inclined to feel that I am a failure	1	2	3	4

SOFA Molloy, G. N. & Pallant, J. F. (2002). A Short Scale of Family Atmosphere (SOFA): Development and Psychometric Evaluation. *North American Journal of Psychology*, **4,** 243-248.

Here are some statements about how you, or people in your family, might feel or act. Circle the number (1 to 5) that indicates how much you Agree or Disagree with each statement.

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	My childhood has been a happy one	1	2	3	4	5
2	I respect my family	1	2	3	4	5
3	My family fight a lot	1	2	3	4	5
4	I have (had) a happy and close relationship with my mother	1	2	3	4	5
5	My house is full of tensions and disagreements	1	2	3	4	5
6	I enjoy being around my family	1	2	3	4	5
7	I have (had) a happy and close relationship with my father	1	2	3	4	5
8	My family listen and take notice of what I say	1	2	3	4	5
9	My family rarely argue	1	2	3	4	5
10	Sometimes members of my family are physically violent to each other	1	2	3	4	5

Perceived Stress Scale (PSS) Cohen, S., Kamarck, T. & Mermelstein, R (1983). A global measure of perceived stress, *Journal of Health and Social Behaviour*, **24**, 385-396.

The following statements ask about your feelings and thoughts during the last few weeks. Indicate the alternative given below (1 to 5) that seems like a reasonable estimate for you.

Never	Almost Never	Sometimes	Fairly Often	Very Often
1	2	3	4	5

In the last few weeks, how often have you

1. ____ been upset because of something that happened unexpectedly?

2. ____ felt that you were unable to control the important things in your life?

3. ____ felt nervous and stressed?

4. ____ felt confident about your ability to handle your personal problems?

5. ____ felt that things were going your way?

6. ____ found that you could not cope with all the things that you had to do?

7. ____ been able to control irritations in your life?

8. ____ felt that you were on top of things?

9. ____ been angered due to things that happened that were outside of your control?

10. ____ felt difficulties were piling up so high that you could not overcome them?

Dukes Social Support Index (DSSI)

Goodger, B., Byles, J., Higganbotham, N. & Mishra, G. (1999). Assessment of a short scale to measure social support among older people. *Australian and New Zealand Jnl of Public Health*, **23 (3)**, 260-265.

The following questions concern your relationships with your family and friends. Please tick the alternative that seems like a reasonable estimate for you.

1. How many people, within one hour's travel form your home, do you feel you can depend on or feel very close to? Do not include members of your own family.

☐ 0 people ☐ 1 – 2 people ☐ 3 or more people

2. How many times during the past week did you spend some time with someone who does not live with you. (E.g. you went to see them, they came to visit you, or you went out together)?

☐ none ☐ two times ☐ four times ☐ six times
☐ one time ☐ three times ☐ five times ☐ seven times or more

3. How many times during the past week did you talk to friends or relatives on the telephone?

☐ none ☐ two times ☐ four times ☐ six times
☐ one time ☐ three times ☐ five times ☐ seven times or more

4. Does it seem that your family and friends understand you?

☐ none of the time ☐ hardly ever ☐ some of the time
☐ most of the time ☐ all of the time

5. Do you feel useful to your family and friends?

☐ none of the time ☐ hardly ever ☐ some of the time
☐ most of the time ☐ all of the time

6. Do you know what is going on with your family and friends?

☐ none of the time ☐ hardly ever ☐ some of the time
☐ most of the time ☐ all of the time

7. When you are talking with your family and friends, do you feel you are being listened to?

☐ none of the time ☐ hardly ever ☐ some of the time
☐ most of the time ☐ all of the time

8. Do you feel you have a definite role in your family and among your friends?

☐ none of the time ☐ hardly ever ☐ some of the time
☐ most of the time ☐ all of the time

9. Can you talk about your deepest problems with at least some of your family and friends?

☐ none of the time ☐ hardly ever ☐ some of the time
☐ most of the time ☐ all of the time

10. How satisfied are you with the relationships you have with your family and friends?

☐ extremely dissatisfied ☐ very dissatisfied ☐ somewhat dissatisfied
☐ satisfied most of the time ☐ satisfied all of the time

Thank you for your time and assistance in answering these questions. There are only a few more to go …

☺

Beck Depression Inventory (BDI)

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory*, 2nd ed. San Antonio, TX: The Psychological Corporation.

Please read each group of statements carefully, and then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group.

1 Sadness
- 0 I do not feel sad
- 1 I feel sad much of the time
- 2 I am sad all the time
- 3 I am so sad or unhappy that I can't stand it

2 Pessimism
- 0 I am not discouraged about my future
- 1 I feel more discouraged about my future than I used to be
- 2 I do not expect things to work out for me
- 3 I feel my future is hopeless and will only get worse

3 Past Failure
- 0 I do not feel like a failure
- 1 I have failed more than I should have
- 2 As I look back, I see a lot of failures
- 3 I feel I am a total failure as a person

4 Loss of Pleasure
- 0 I get as much pleasure as I ever did from the things I enjoy
- 1 I don't enjoy things as much as I used to
- 2 I get very little pleasure from the things I used to enjoy
- 3 I can't get any pleasure from the things I used to enjoy

5 Guilty Feelings
- 0 I don't feel particularly guilty
- 1 I feel guilty over many things I have done or should have done
- 2 I feel quite guilty most of the time
- 3 I feel guilty all of the time

6 Punishment Feelings
- 0 I don't feel I am being punished
- 1 I feel I may be punished
- 2 I expect to be punished
- 3 I feel I am being punished

7 Self-Dislike
- 0 I feel the same about myself as ever
- 1 I have lost confidence in myself
- 2 I am disappointed in myself
- 3 I dislike myself

8 Self-Criticalness
- 0 I don't criticize myself or blame myself more than usual
- 1 I am more critical of myself than I used to be
- 2 I criticize myself for all of my faults
- 3 I blame myself for everything bad that happens

9 Suicidal Thoughts or Wishes
- 0 I don't have any thoughts of killing myself
- 1 I have thoughts of killing myself, but I would not carry them out
- 2 I would like to kill myself
- 3 I would kill myself if I had the chance

10 Crying
- 0 I don't cry anymore than I used to
- 1 I cry more than I used to
- 2 I cry over every little thing

I feel like crying but I can't

11 Agitation
- 0 I am no more restless or wound up than usual
- 1 I feel more restless or wound up than usual
- 2 I am so restless or agitated that it's hard to stay still
- 3 I am so restless or agitated that I have to keep moving or doing something

12 Loss of Interest
- 0 I have not lost interest in other people or activities
- 1 I am less interested in other people or things than before
- 2 I have lost most of my interest in other people or things
- 3 It's hard to get interested in anything

13 Indecisiveness
- 0 I make decisions about as well as ever
- 1 I find it more difficult to make decisions than usual
- 2 I have much greater difficulty in making decisions than I used to
- 3 I have trouble making any decisions

14 Worthlessness
- 0 I do not feel I am useless
- 1 I don't consider myself as worthwhile and useful as I used to
- 2 I feel more worthless as compared to other people
- 3 I feel utterly worthless

15 Loss of Energy

0 I have as much energy as ever
1 I have less energy than I used to have
2 I don't have enough energy to do very much
3 I don't have enough energy to do anything

16 Changes in Sleeping Pattern

0 I have not experienced any change in my sleeping pattern
1a I sleep somewhat more than usual
1b I sleep somewhat less than usual
2a I sleep a lot more than usual
2b I sleep a lot less than usual
3a I sleep most of the day
3b I wake up 1-2 hours early and can't get back to sleep

17 Irritability

0 I am no more irritable than usual
1 I am more irritable than usual
2 I am much more irritable than usual
3 I am irritable all the time

18 Changes in Appetite

0 I have not experienced any change in my appetite
1a My appetite is somewhat less than usual
1b My appetite is somewhat greater than usual
2a My appetite is much less than before
2b My appetite is much greater than usual
3a I have no appetite at all
3b I crave food all the time

19 Concentration Difficulty

0 I can concentrate as well as ever
1 I can't concentrate as well as usual
2 It's hard to keep my mind on anything for very long
3 I can't concentrate on anything

20 Tiredness or Fatigue

0 I am no more tired or fatigued than usual
1 I get more tired or fatigued more easily than usual
2 I am too tired or fatigued to do a lot of the things I used to do
3 I am too tired or fatigued to do most of the things I used to do

21 Loss of Interest in Sex

0 I have not noticed any recent change in my interest in sex
1 I am less interested in sex than I used to be
2 I am much less interested in sex now
3 I have lost interest in sex completely

Courtauld Emotional Control Scale (CECS) Watson, M. & Greer, S. (1983). Development of a questionnaire measure of emotional control. *Journal of Psychosomatic Research*, **27**, 299-305.

Please circle the number (1 to 4) which best describes the degree to which you act the following ways when experiencing the emotions displayed.

When I feel angry (very annoyed) …		**Almost Never**			**Almost Always**
1	I keep quiet	1	2	3	4
2	I refuse to argue or say anything	1	2	3	4
3	I bottle it up	1	2	3	4
4	I say what I feel	1	2	3	4
5	I avoid making a scene	1	2	3	4
6	I smother my feelings	1	2	3	4
7	I hide my annoyance	1	2	3	4

When I feel unhappy (miserable) …		**Almost Never**			**Almost Always**
1	I refuse to do anything about it	1	2	3	4
2	I hide my unhappiness	1	2	3	4
3	I put on a bold face	1	2	3	4
4	I keep quiet	1	2	3	4
5	I let others see how I feel	1	2	3	4
6	I smother my feelings	1	2	3	4
7	I bottle it up	1	2	3	4

When I feel afraid (worried) …		**Almost Never**			**Almost Always**
1	I let others see how I feel	1	2	3	4
2	I keep quiet	1	2	3	4
3	I refuse to say anything about it	1	2	3	4
4	I tell others all about it	1	2	3	4
5	I say what I feel	1	2	3	4
6	I bottle it up	1	2	3	4
7	I smother my feelings	1	2	3	4

EPI -Extrversion

Eysenck, H. J. & Eysenck, SBG. (1964). *Eysenck Personaluity Inventory*. San Diego, CA. Educational and Industrial Teaching Service.

Please indicate the extent to which you either Agree or Disagree with the following questions by circling the appropriate number (1 to 4).

		Strongly Disagree	Disagree	Agree	Strongly Agree
1	Do you like plenty of excitement and bustle around you?	1	2	3	4
2	Do you nearly always have a 'ready answer'?	1	2	3	4
3	When you are drawn into a quarrel, do you prefer to 'have it out' to being silent, hoping things will blow over?	1	2	3	4
4	Do you like mixing with people?	1	2	3	4
5	Would you call yourself happy-go-lucky?	1	2	3	4
6	Are you rather lively?	1	2	3	4
7	Can you put your thoughts into words quickly?	1	2	3	4
8	Do you like practical jokes?	1	2	3	4
9	Do you very much like good food?	1	2	3	4
10	Are you an easy going person, not generally bothered about having everything 'just-so'?	1	2	3	4
11	When you make new friends, is it you who makes the first move or does the inviting?	1	2	3	4
12	Do you generally feel that things will sort themselves out and come right in the end somehow?	1	2	3	4
13	Do you sometimes say the first thing that comes into your head?	1	2	3	4
14	Do you like cracking jokes and telling funny stories to your friends?	1	2	3	4
15	When the odds are against you, do you still usually think it is worth taking a chance?	1	2	3	4
16	Do you usually stay in the background at parties and 'get-togethers'?	1	2	3	4
17	Do you like working alone?	1	2	3	4
18	Do you feel uncomfortable in anything but everyday clothes?	1	2	3	4
19	Do you mind selling things or asking people for money for some causes?	1	2	3	4
20	Would you rather be at home on your own than go to a boring party?	1	2	3	4
21	Do you like planning things carefully, well ahead of time?	1	2	3	4
22	Can you usually do things better by figuring them out alone than by talking to others about it?	1	2	3	4
23	Would you rather plan things than do things?	1	2	3	4
24	Do you usually keep 'yourself to yourself' except with very close friends?	1	2	3	4

General Health Questionnaire (GHQ)
Goldberg, D. (1992). *General Health Questionnaire (GHQ-12)*. Windsor: NFER-NELSON.

These questions concern how your health has been in general, over the last few weeks. Please circle the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those that you had in the past.

Have you recently …

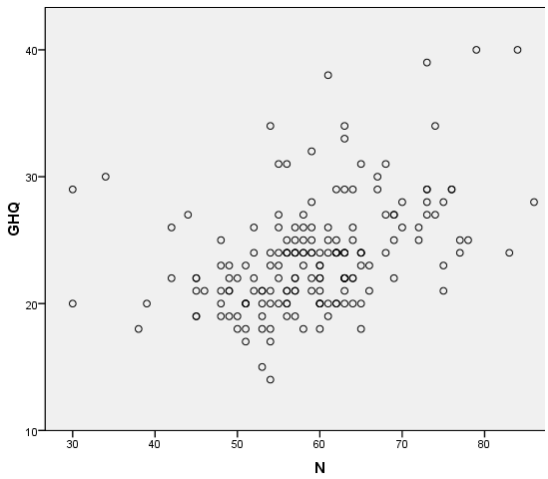
1	been able to concentrate on whatever you're doing?	Better than usual	Same as usual	Less than usual	Much less than usual
2	lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
3	felt that you are playing a useful part in things?	More so than usual	Same as usual	Less useful than usual	Much less useful
4	felt capable of making decisions about things?	More so than usual	Same as usual	Less so than usual	Much less than usual
5	felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
6	felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
7	been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
8	been able to face up to your problems?	More so than usual	Same as usual	Less so than usual	Much less than usual
9	been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
10	been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
11	been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
12	been feeling reasonably happy, all things considered?	More so than usual	About same as usual	Less so than usual	Much less than usual

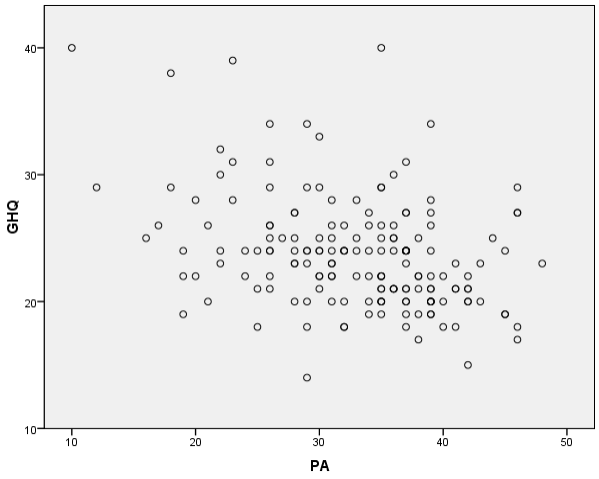
Thank you for completing the entire questionnaire booklet!

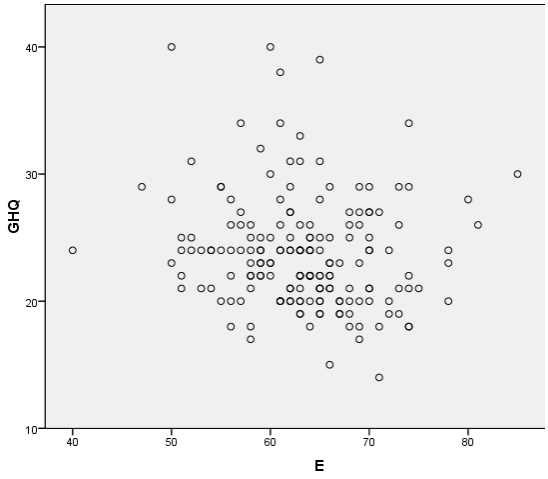
I greatly appreciate the time and effort you spent in assisting me with this research.

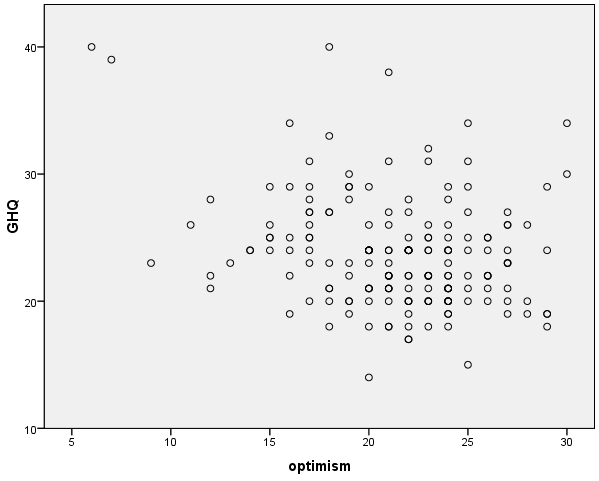
☺

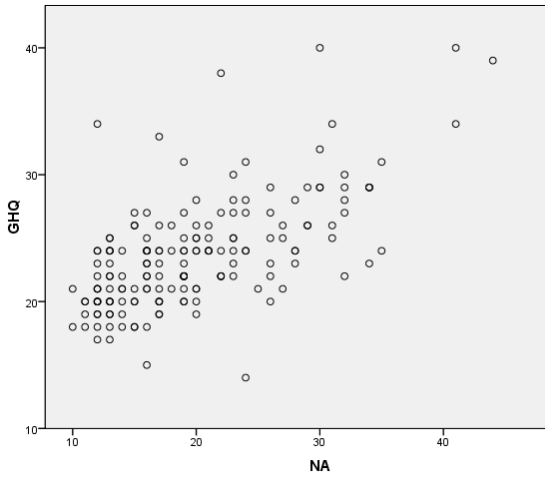
Appendix C: Scatterplots for correlations

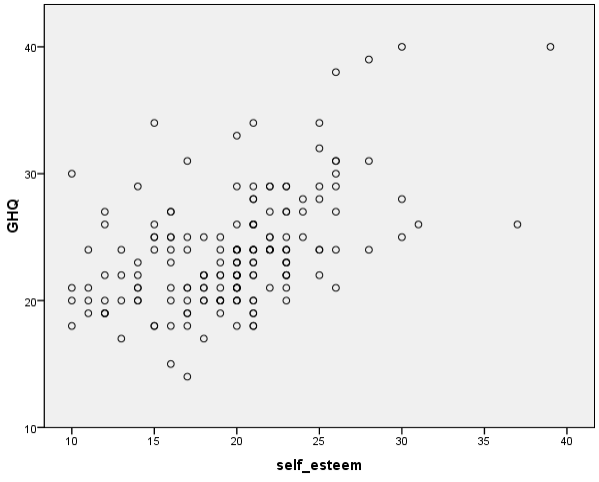


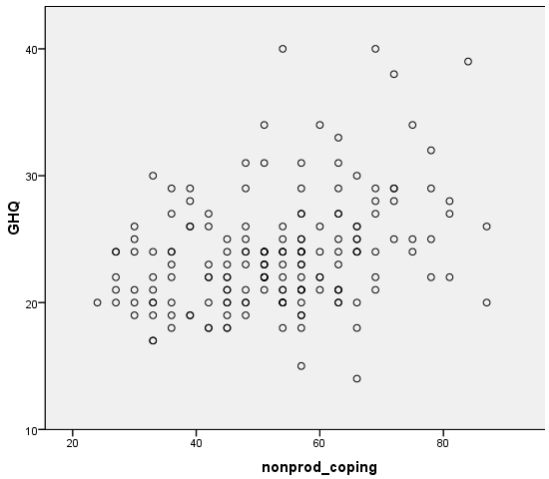








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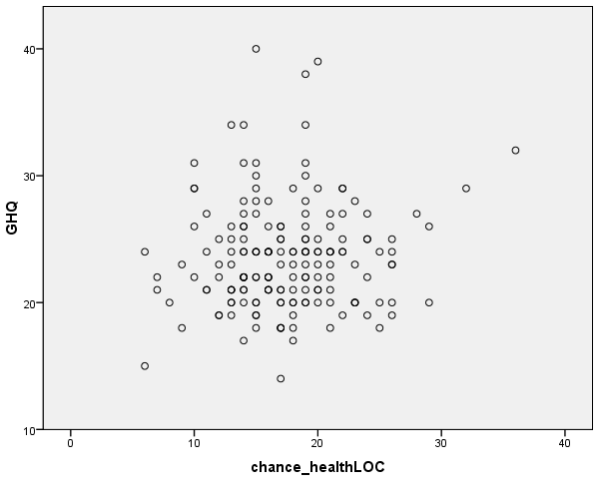
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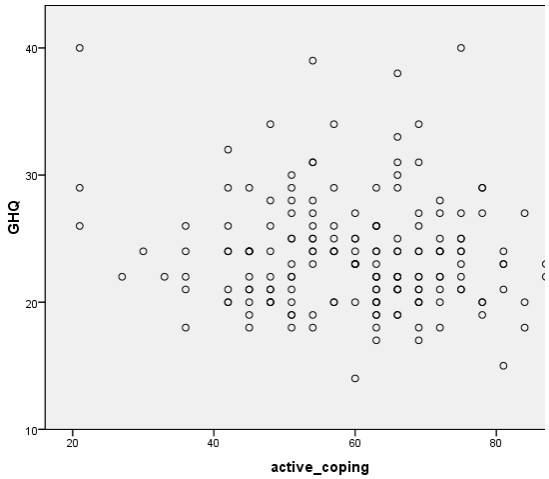
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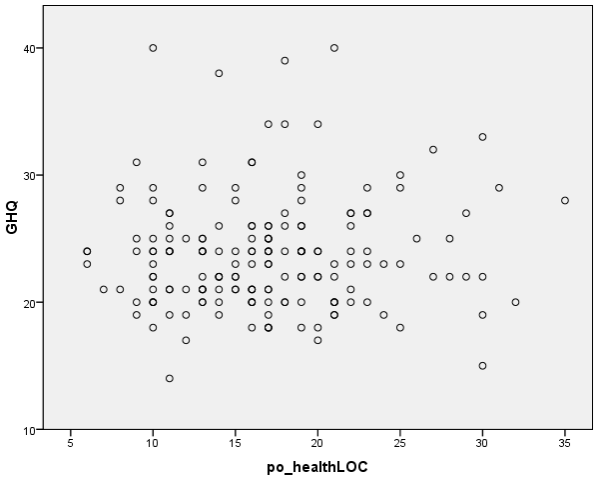
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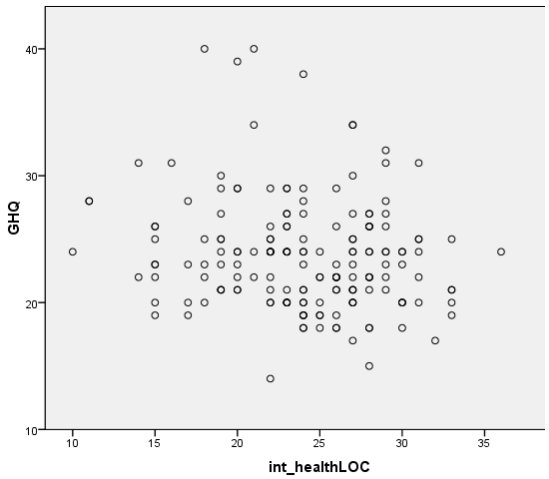
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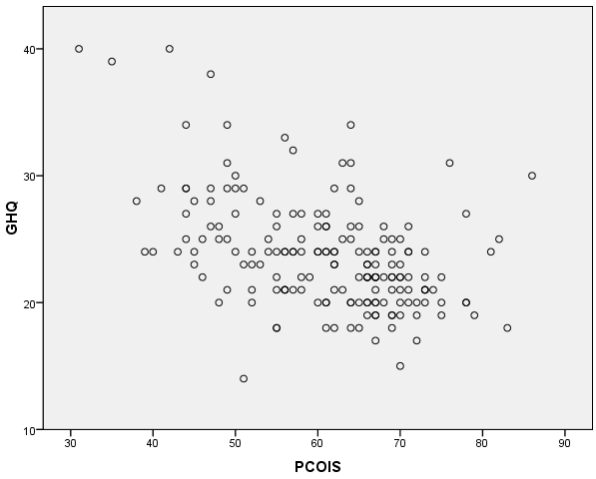
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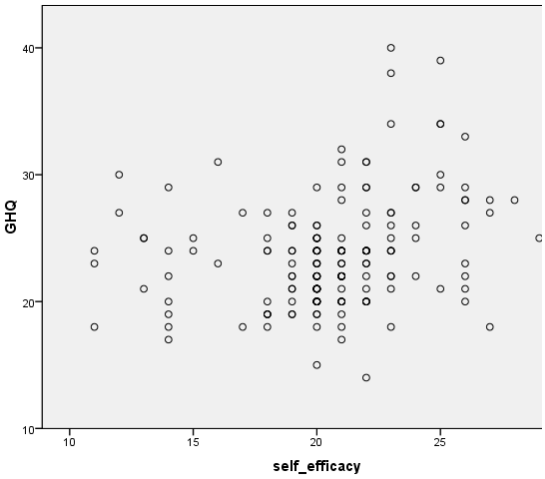
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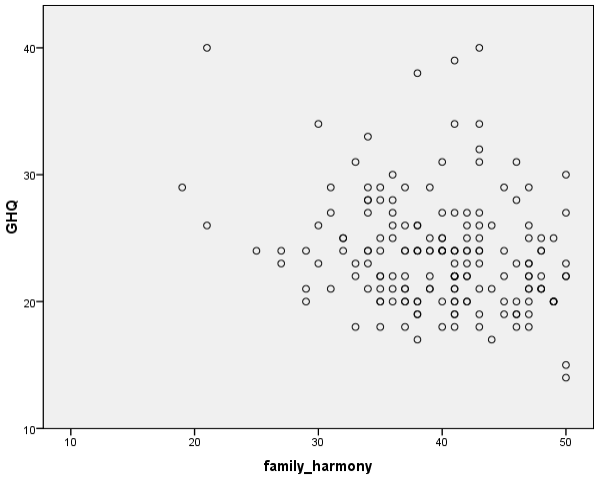
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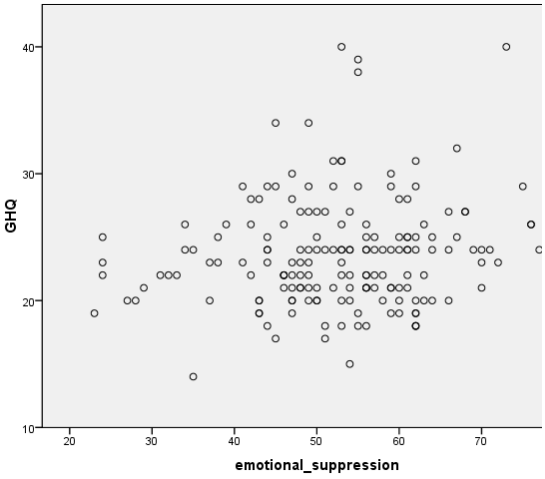
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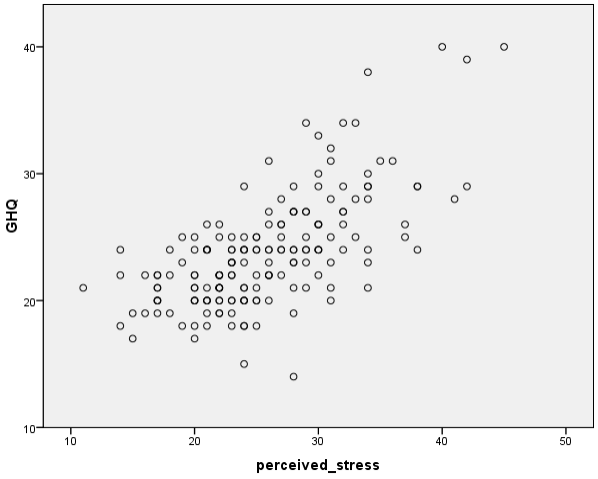
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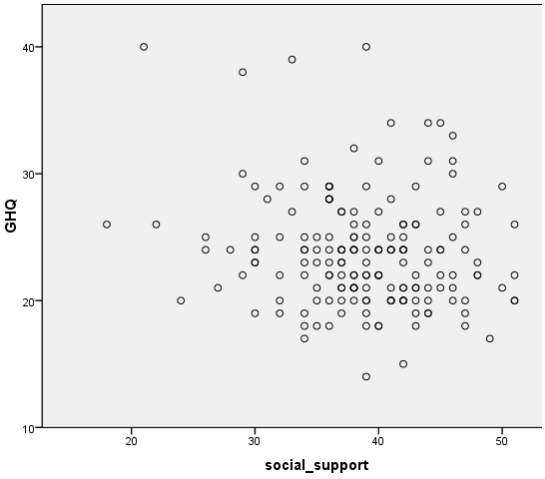
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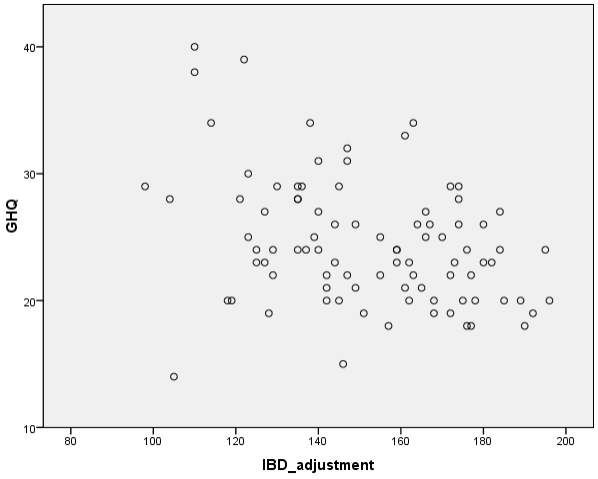
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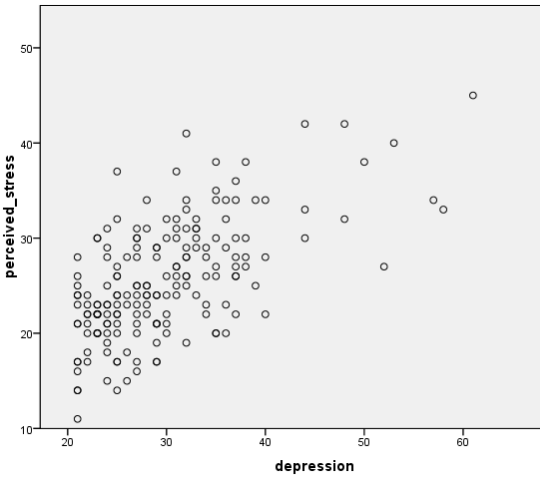
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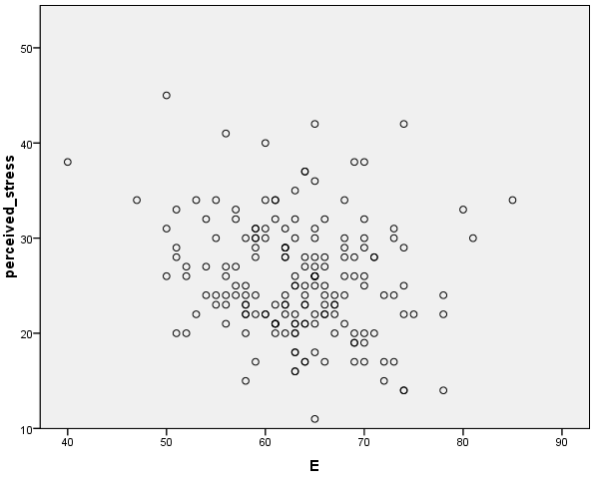
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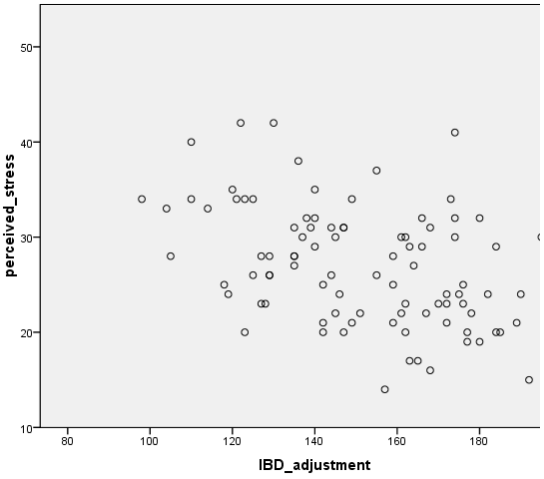
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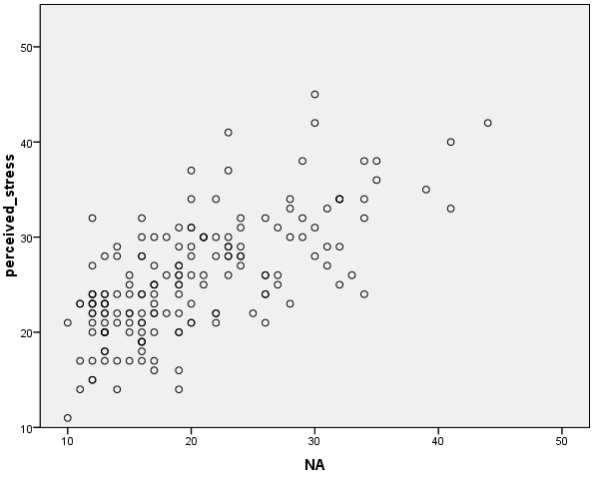
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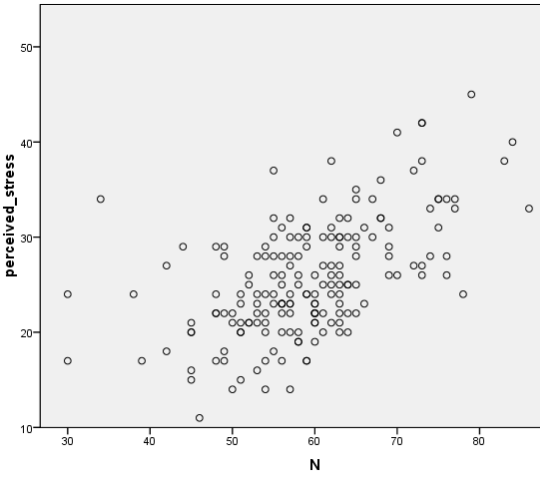
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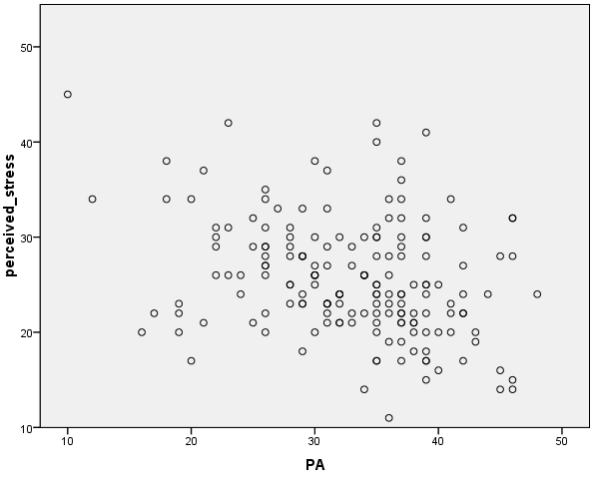
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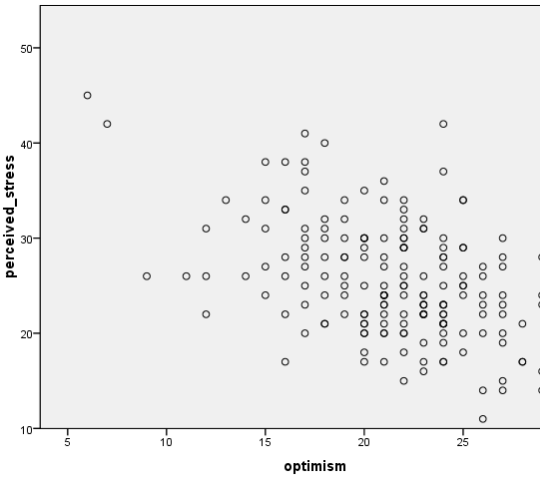
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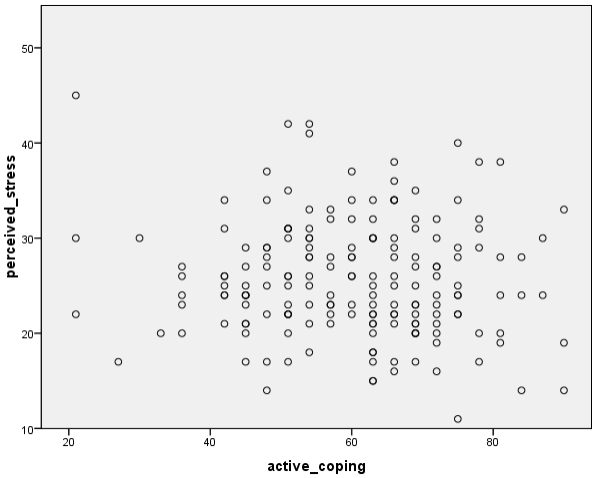
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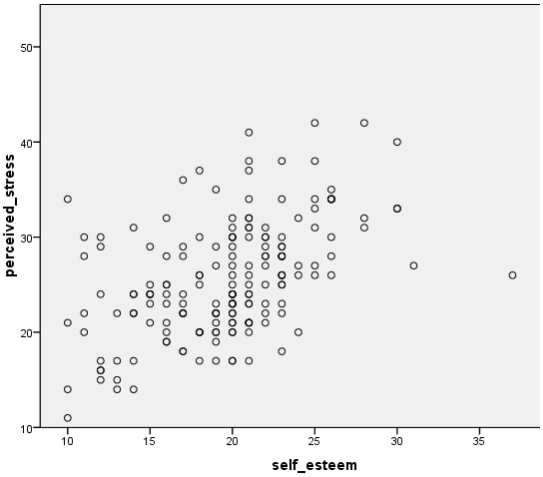
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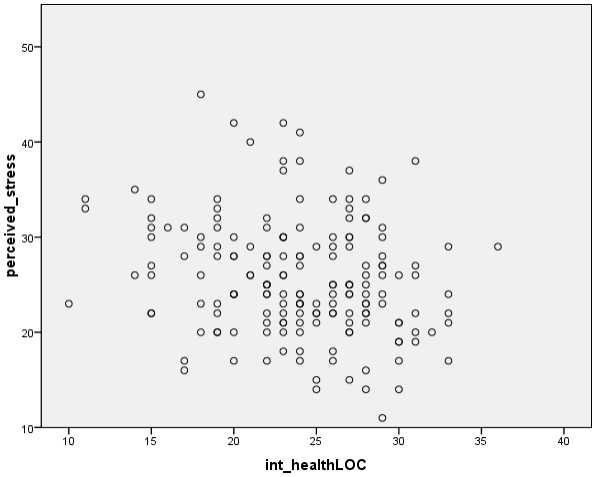
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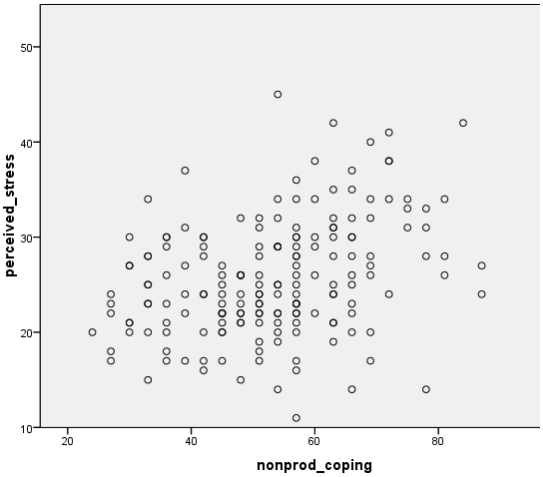
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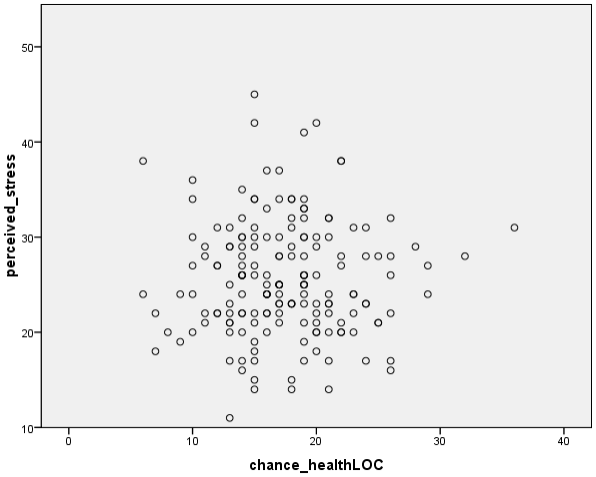
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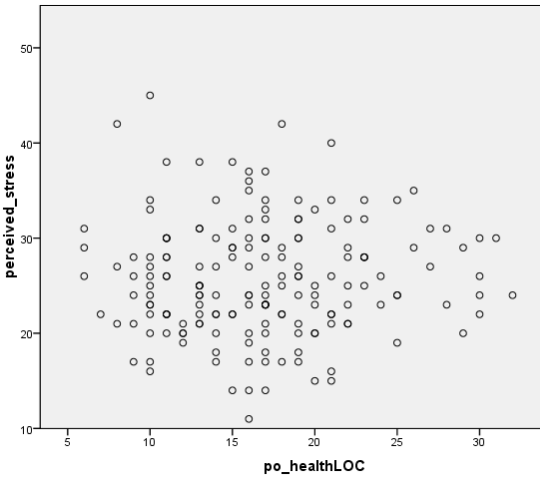
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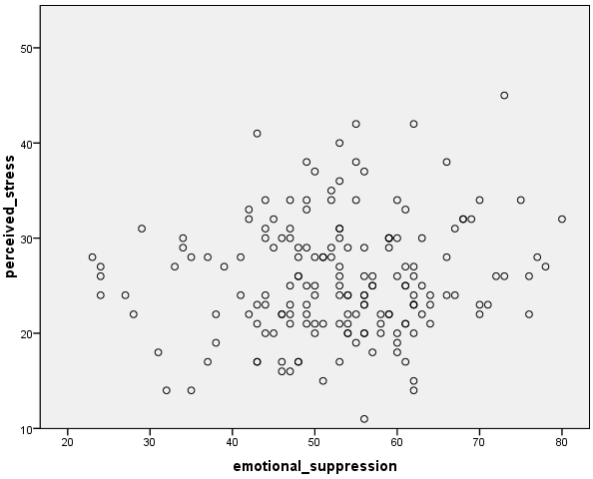
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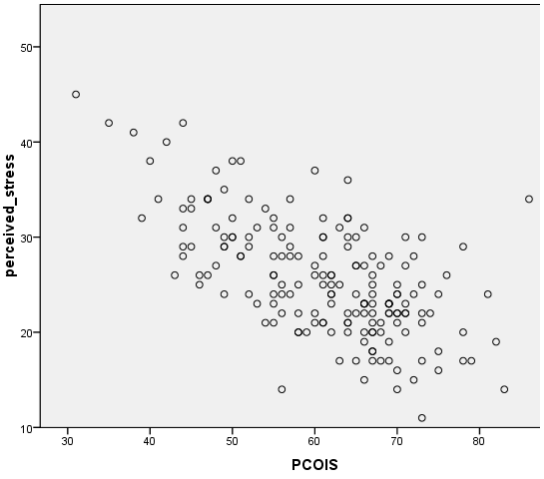
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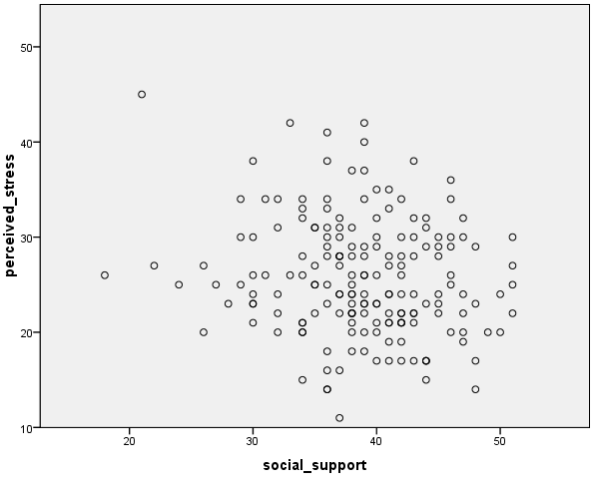
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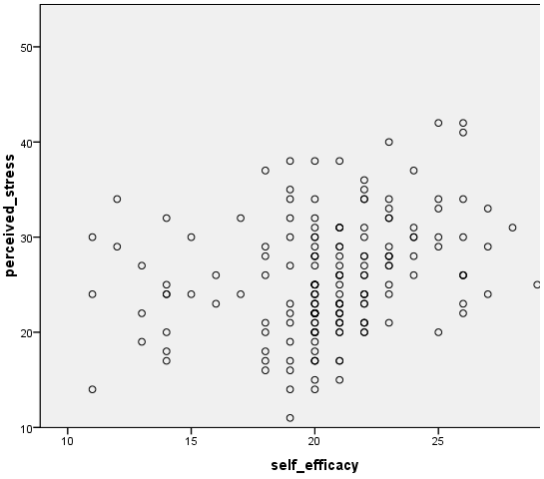
social_support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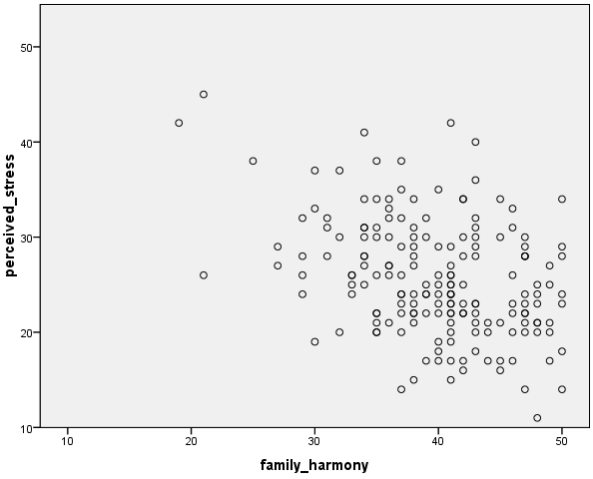
perceived_stress
family_harmony

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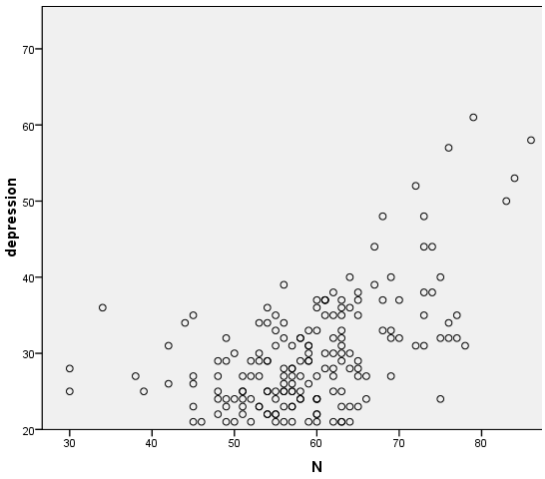
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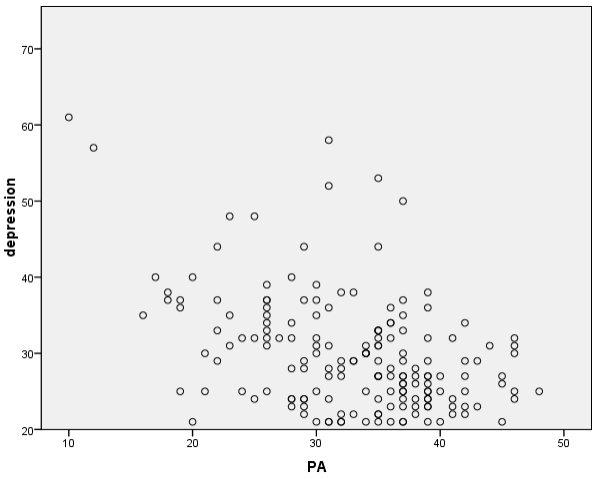
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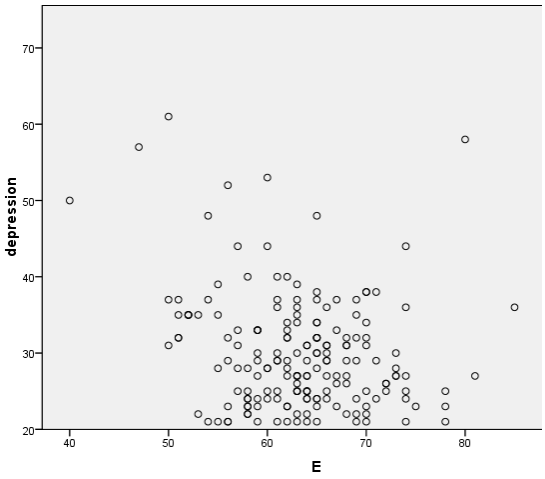
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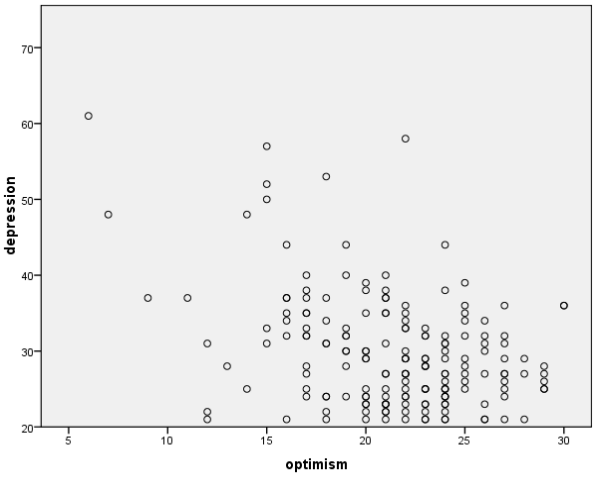
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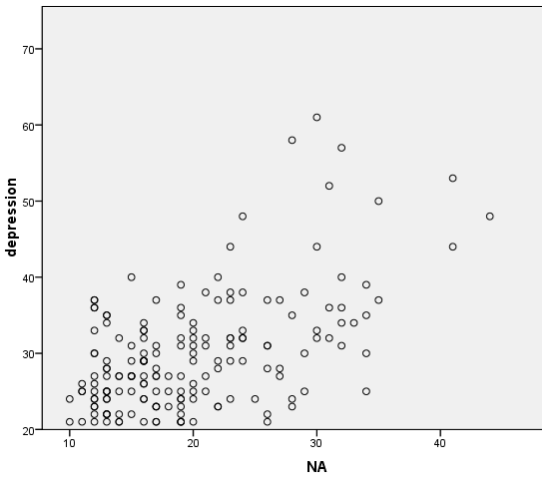
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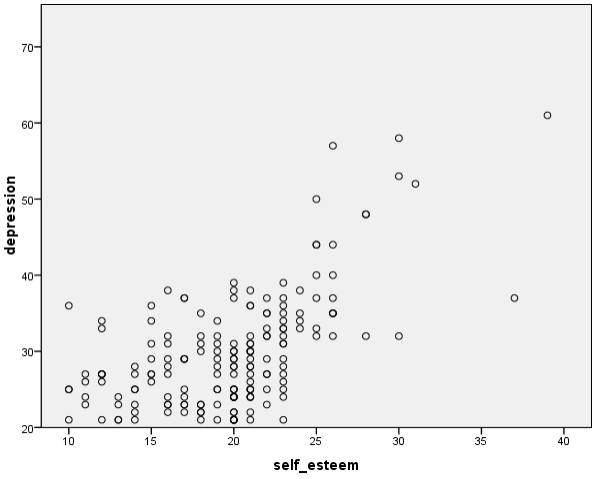
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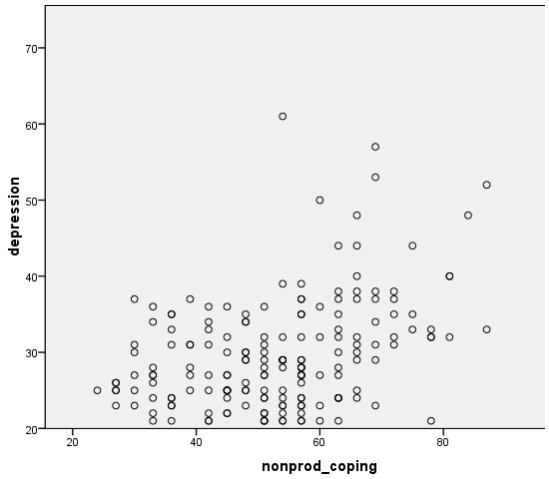
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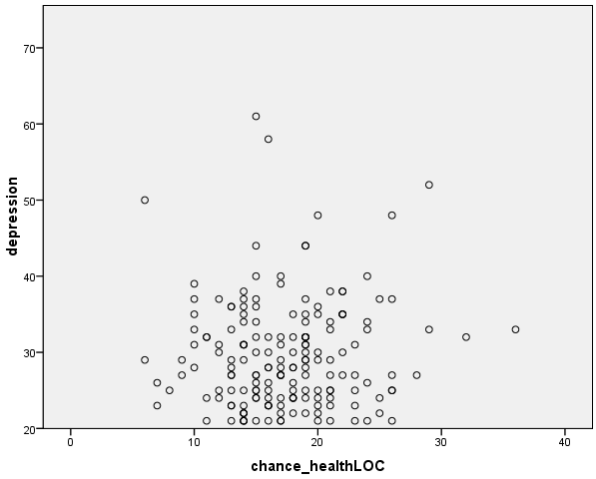
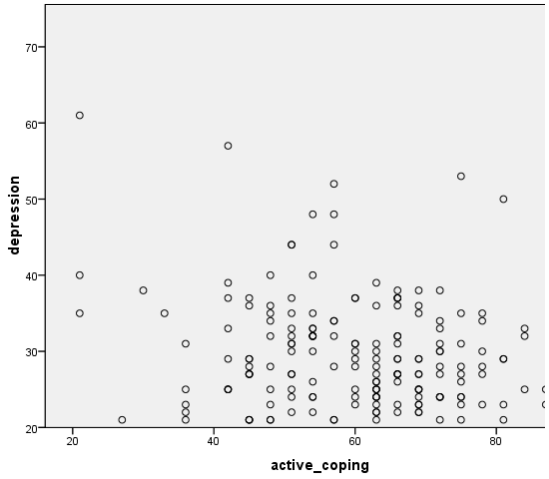

depression
chance_healthLOC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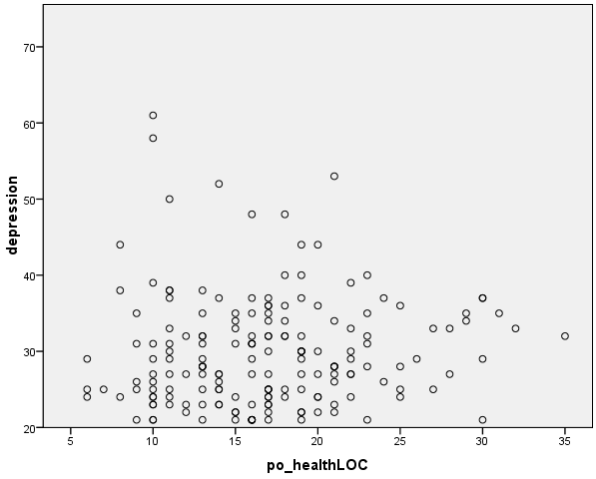
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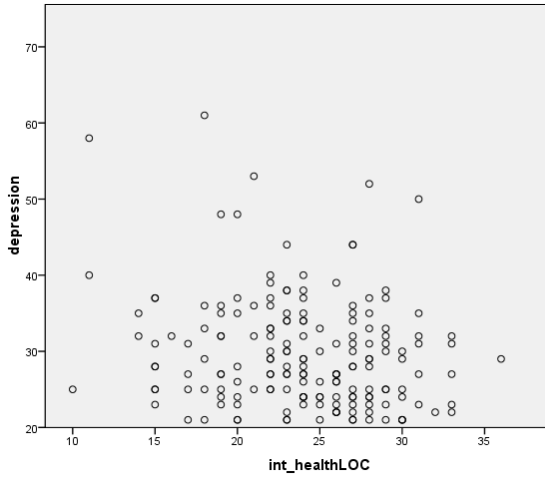
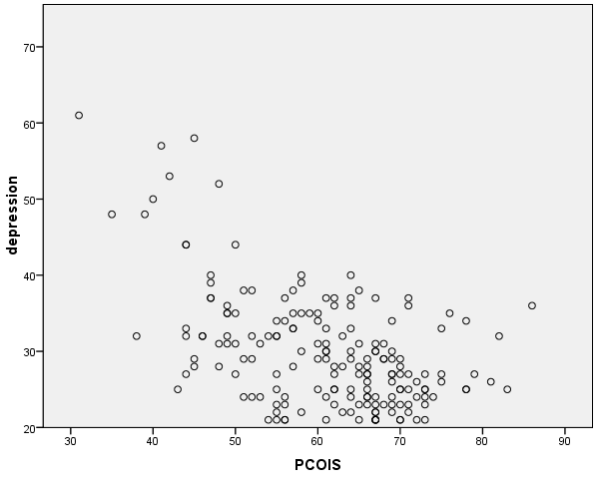
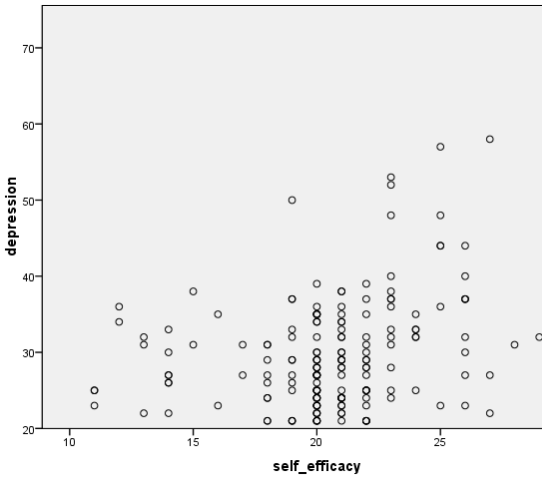
po_healthLOC


depression
int_healthLOC


depression
PCOIS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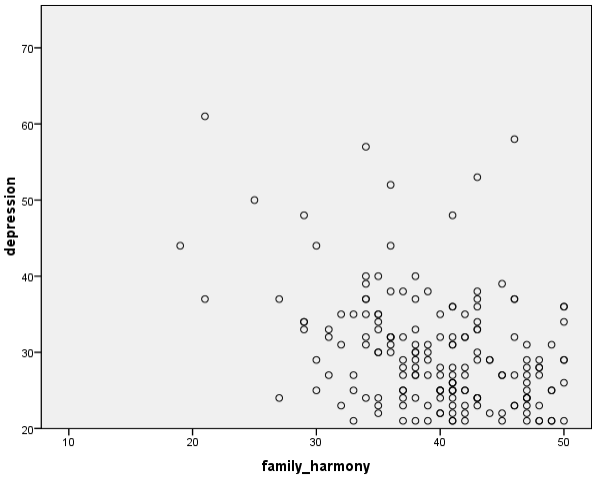
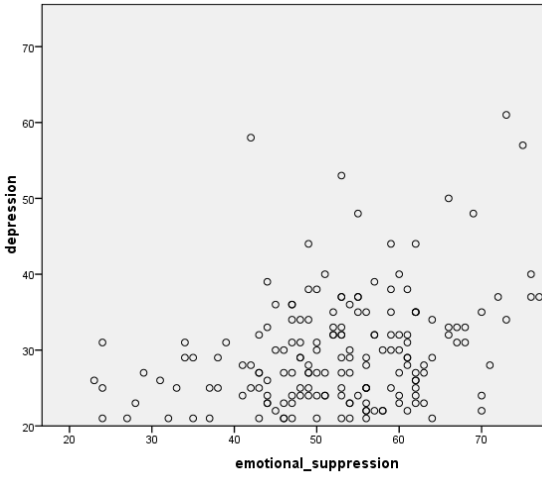
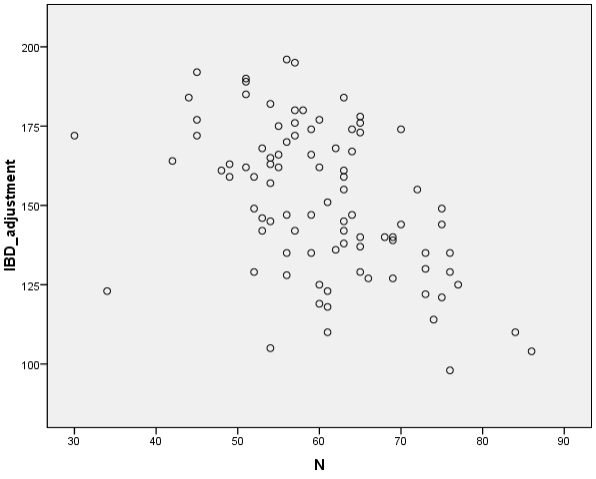
self_efficacy


depression
family_harmony


depression
emotional_suppression


IBD_adjustment
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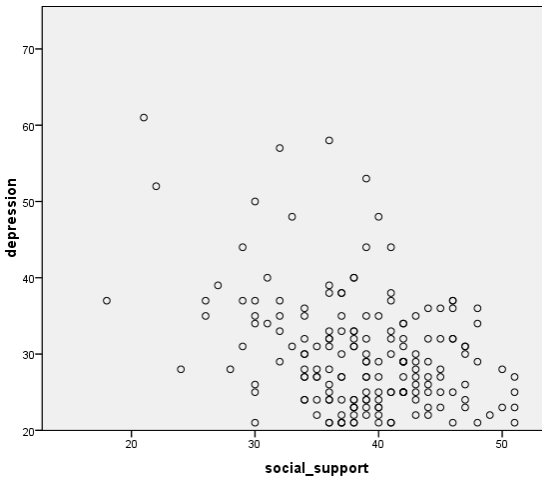
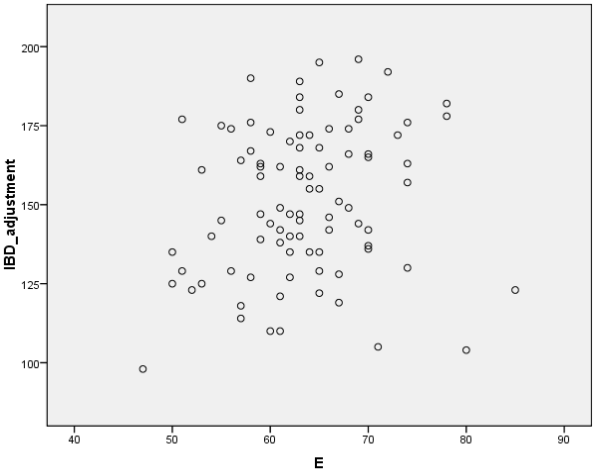

depression
social_support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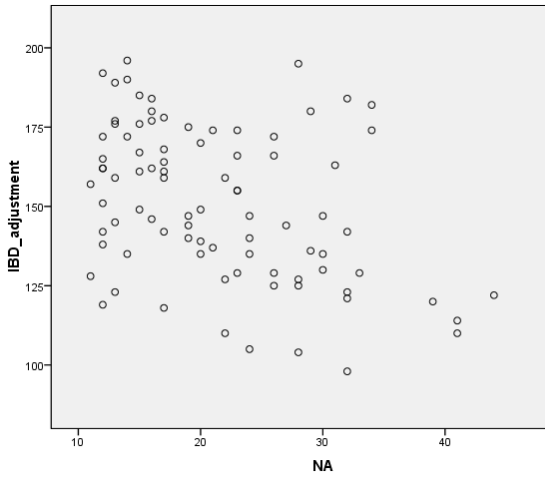
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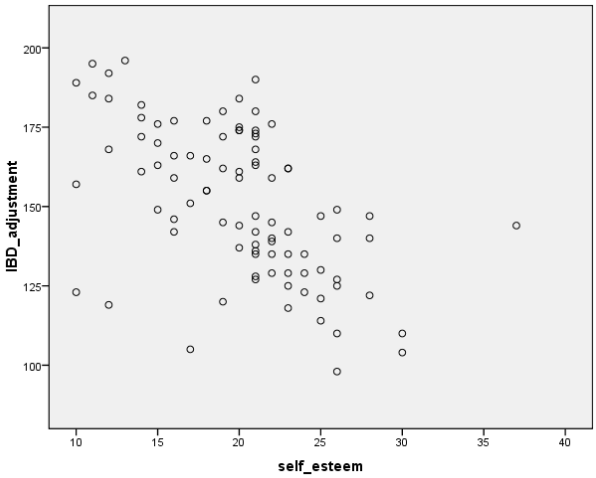
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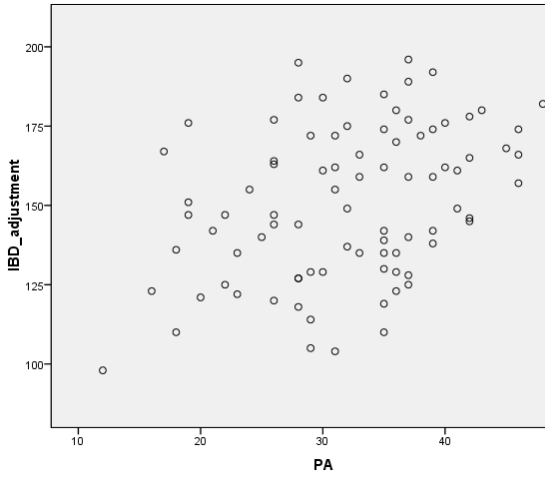
self_esteem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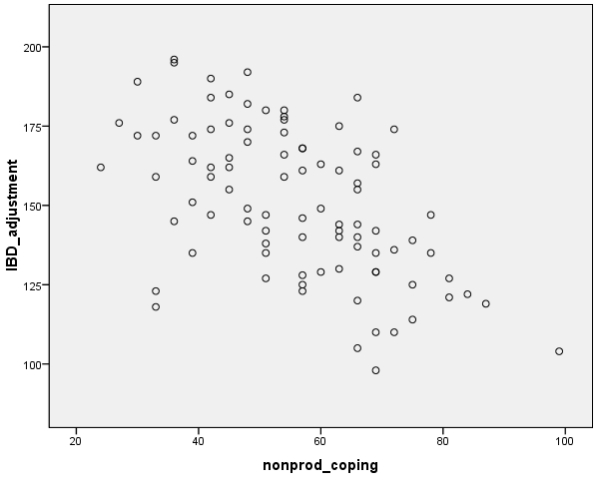
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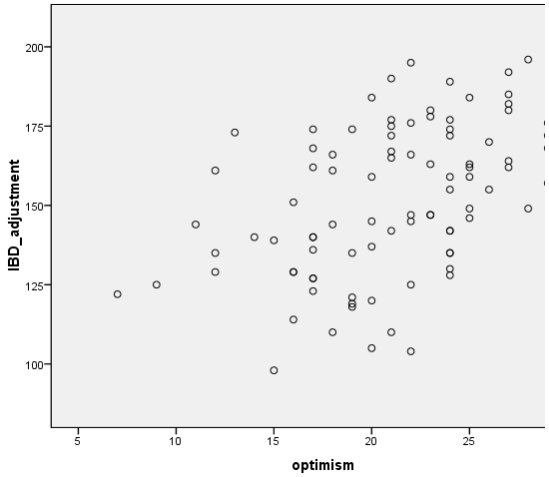
nonprod_coping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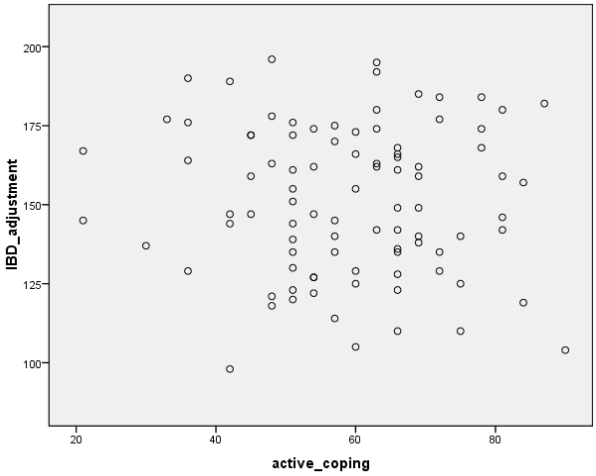
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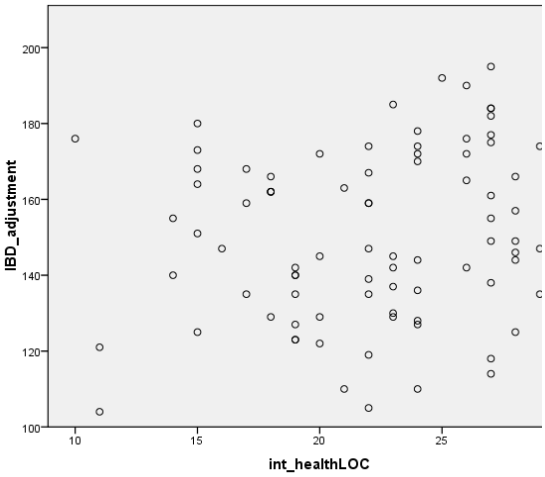
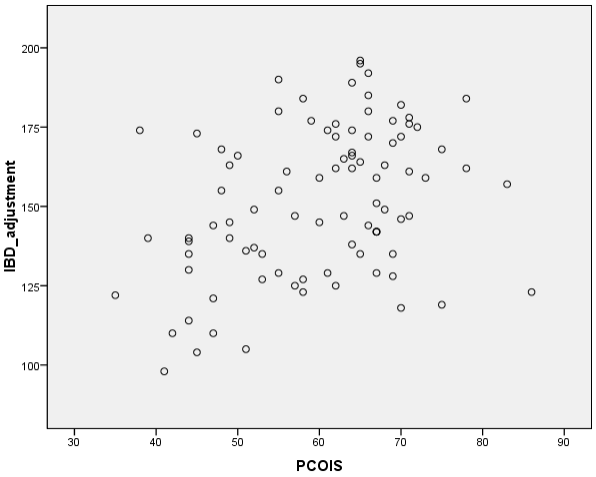

IBD_adjustment
int_healthLOC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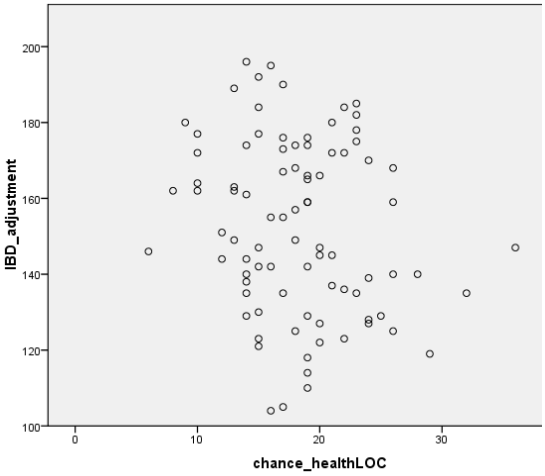
PCOIS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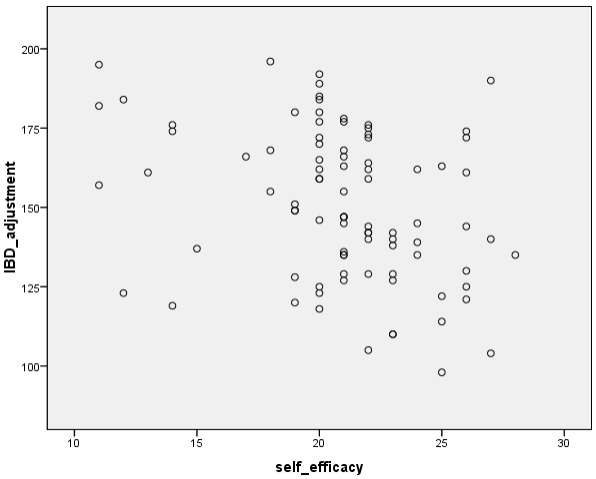
chance_healthLOC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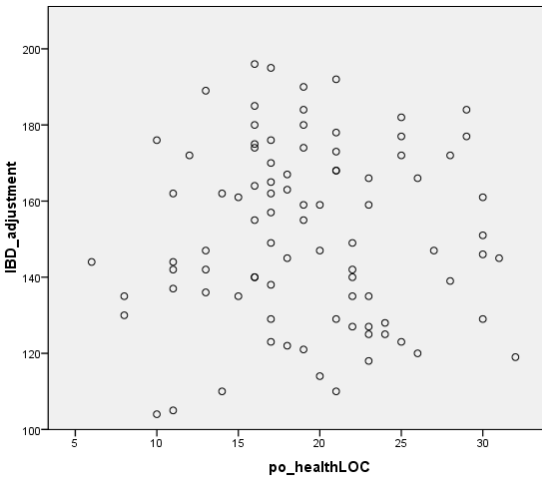
self_efficacy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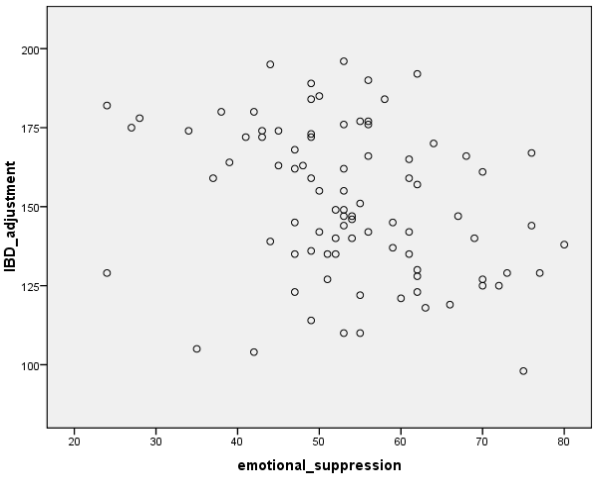
po_healthLOC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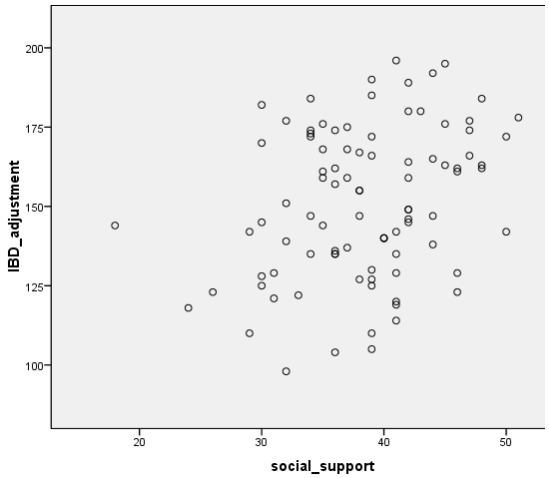
IBD_adjustment
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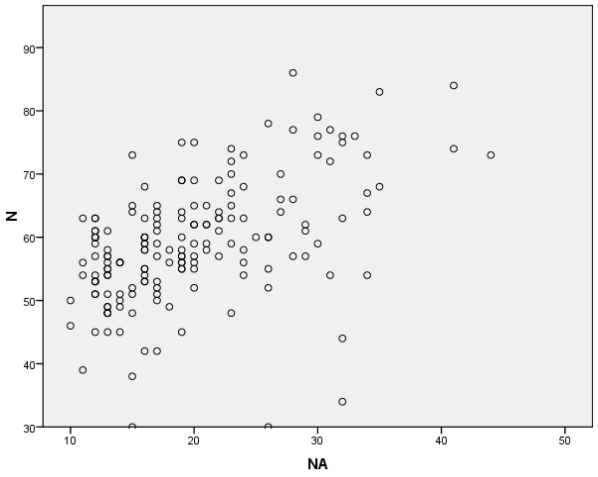
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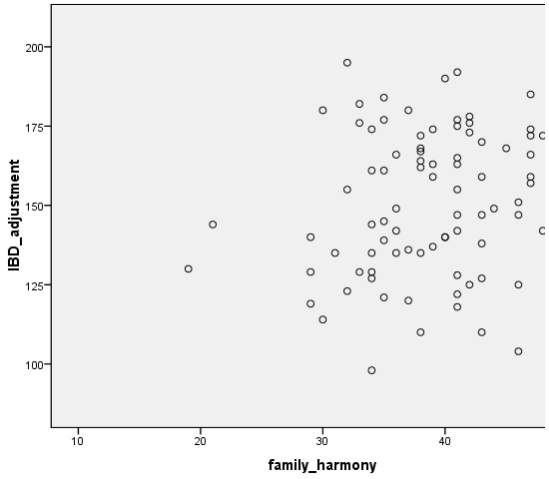
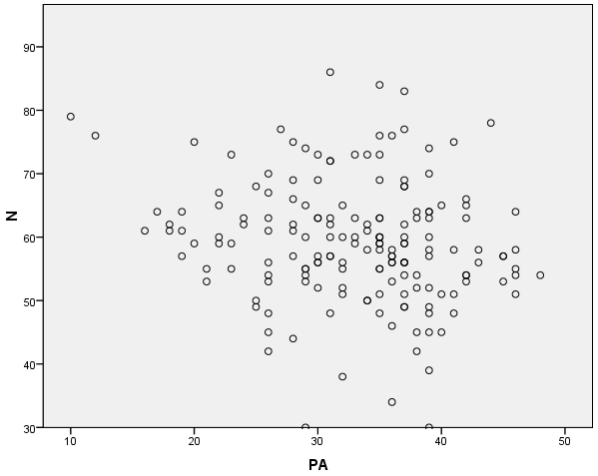

IBD_adjustment
family_harmony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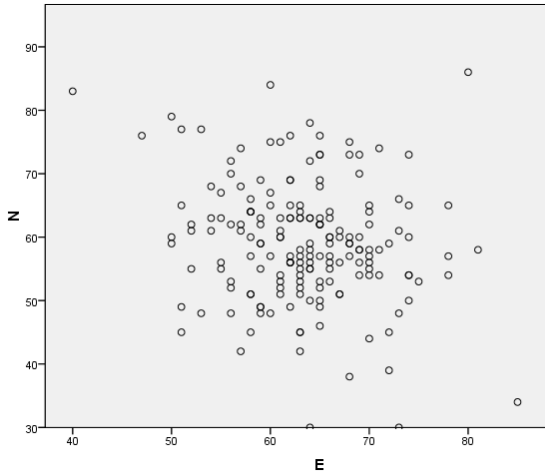
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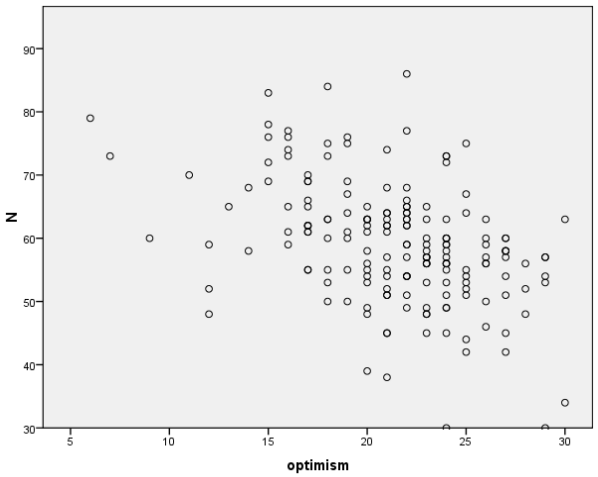
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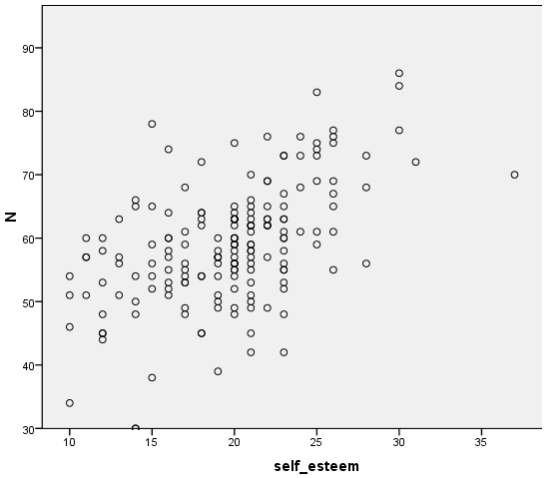
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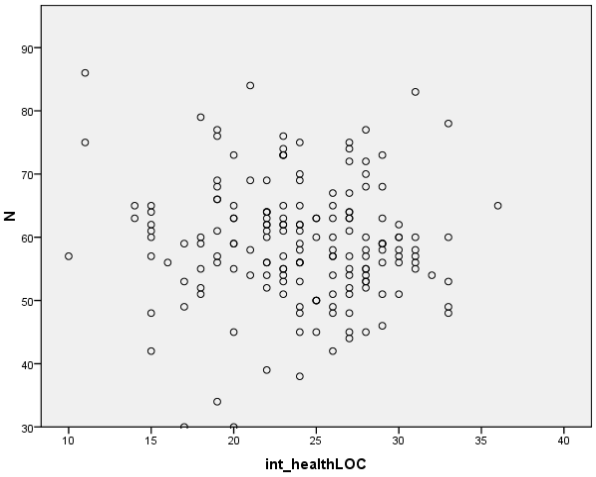
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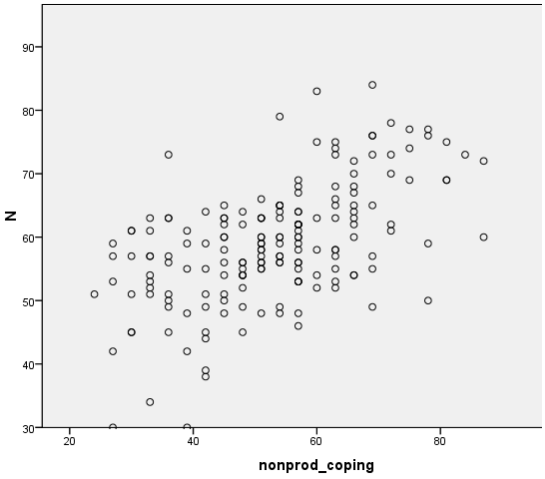
int_healthLOC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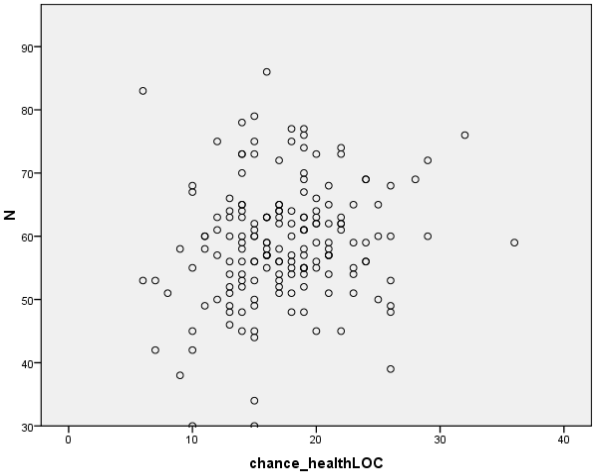
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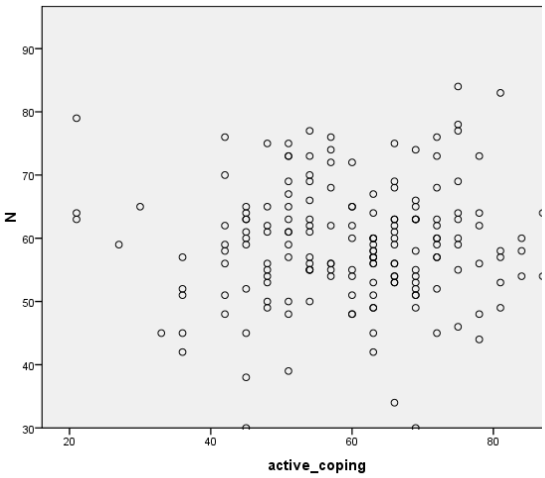
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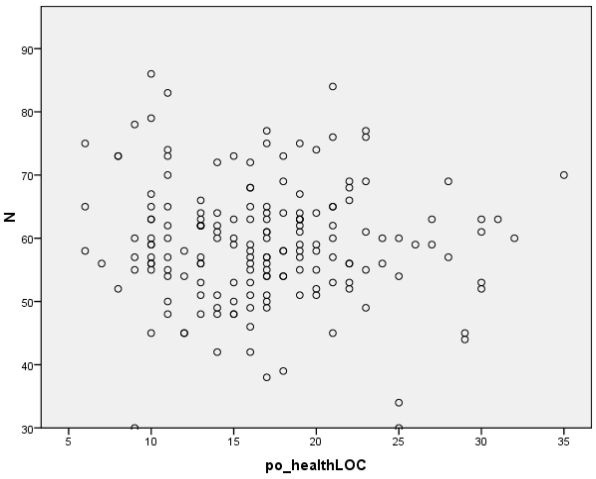
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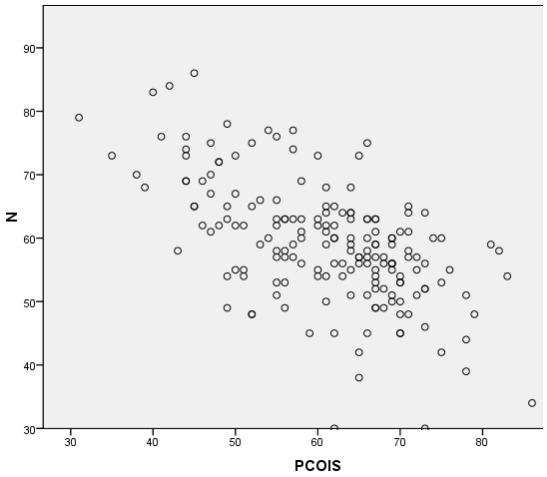
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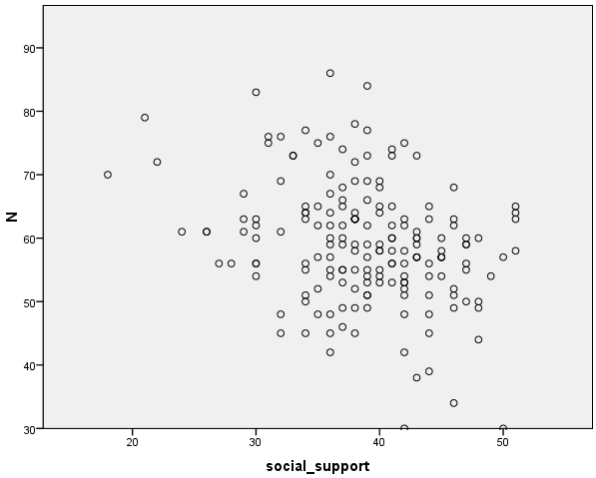
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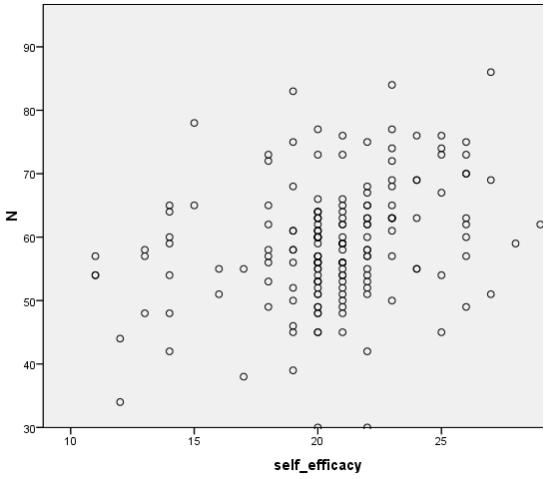
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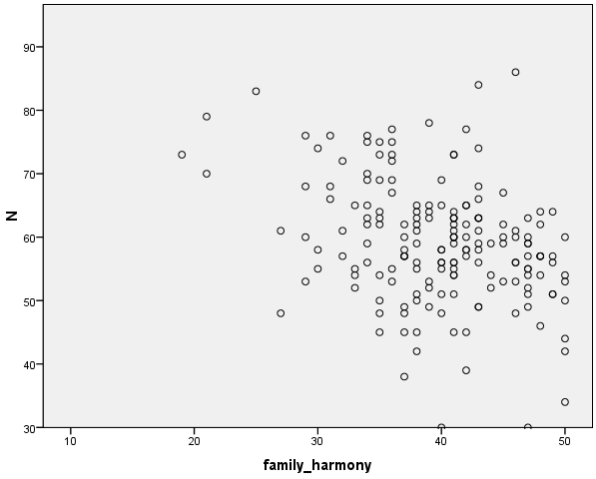
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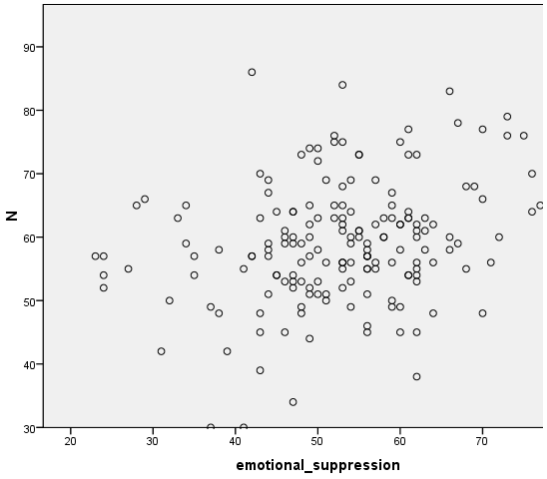
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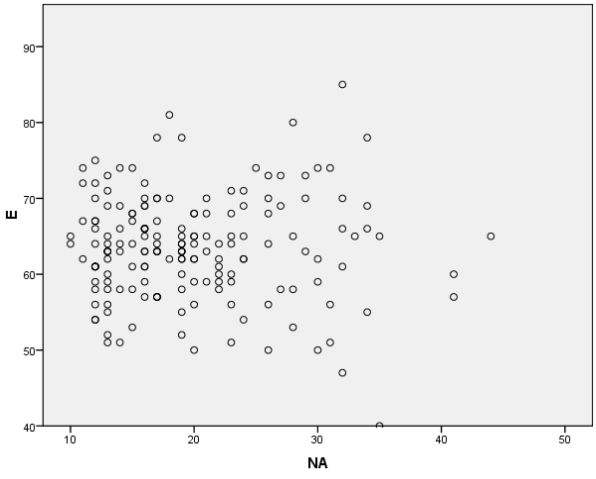
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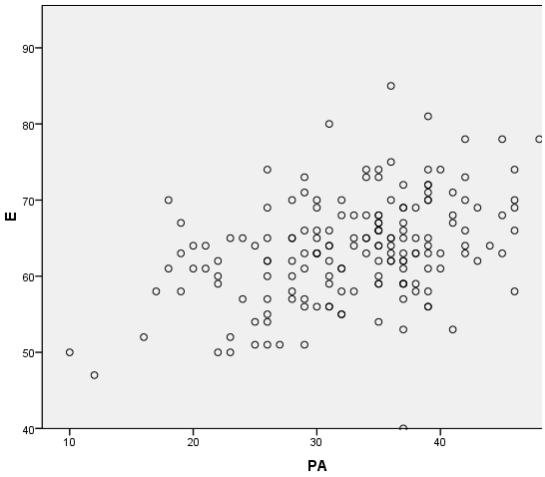
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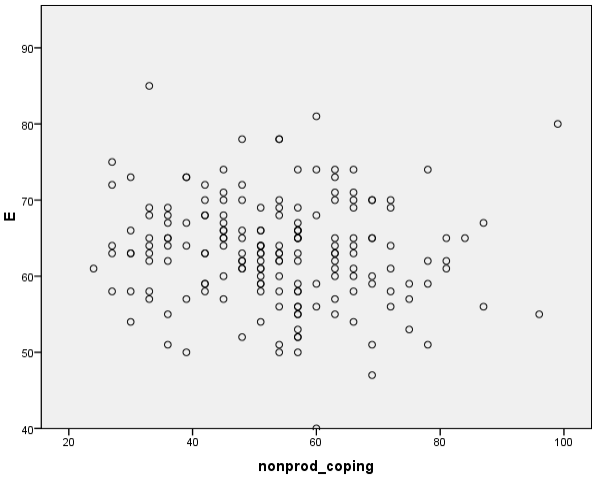
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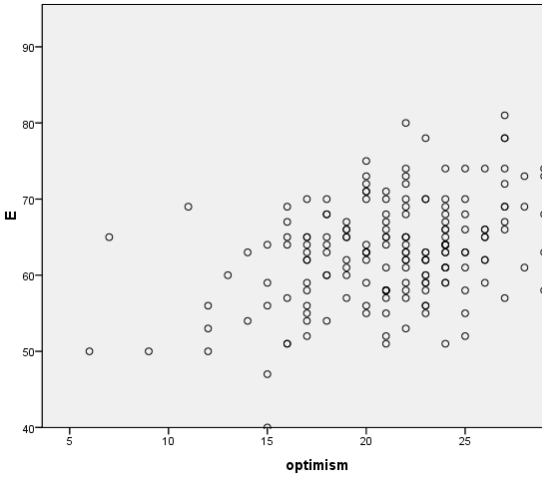
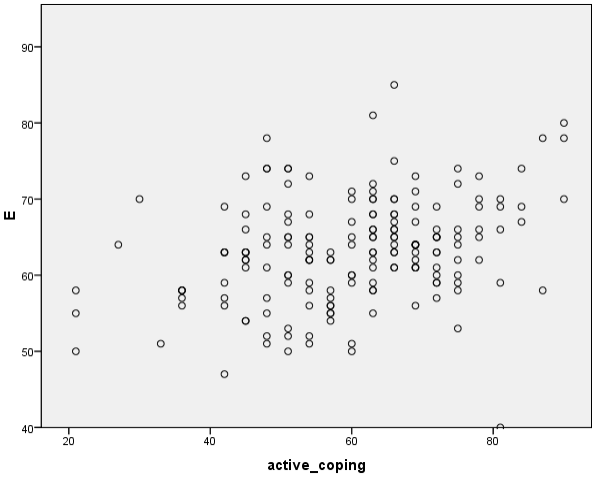

E
optimism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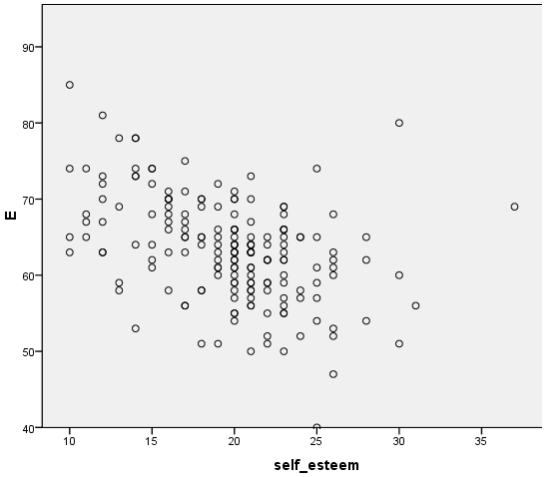
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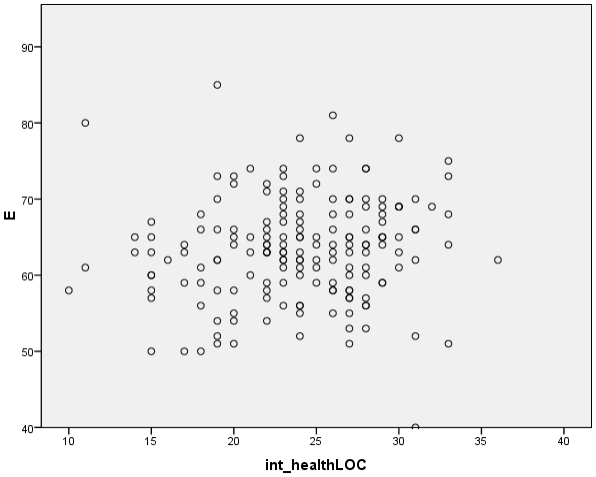
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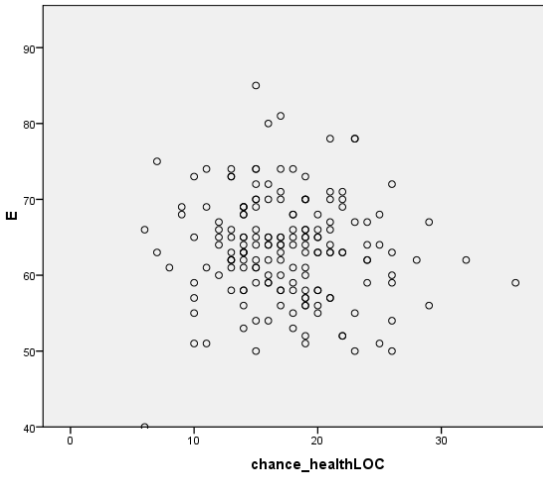
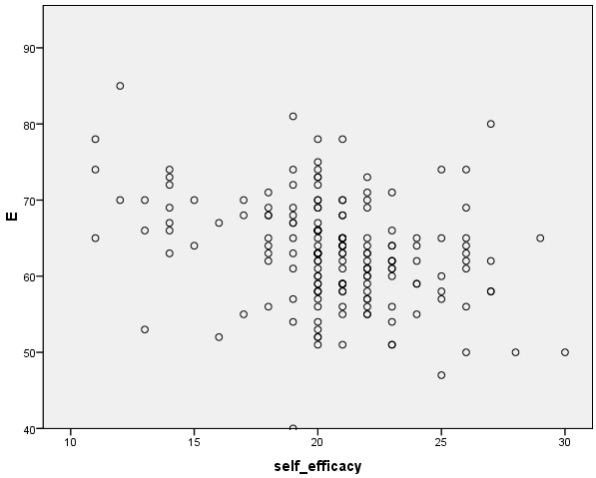

E
chance_healthLOC


E
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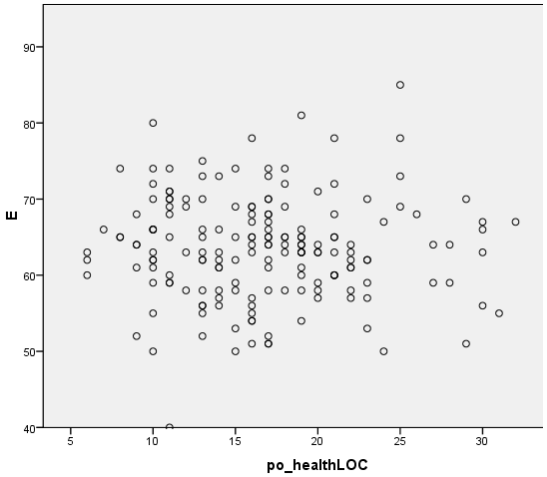
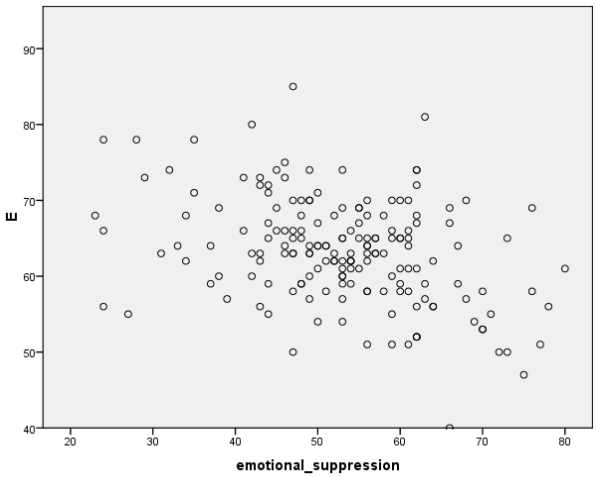

E
po_healthLOC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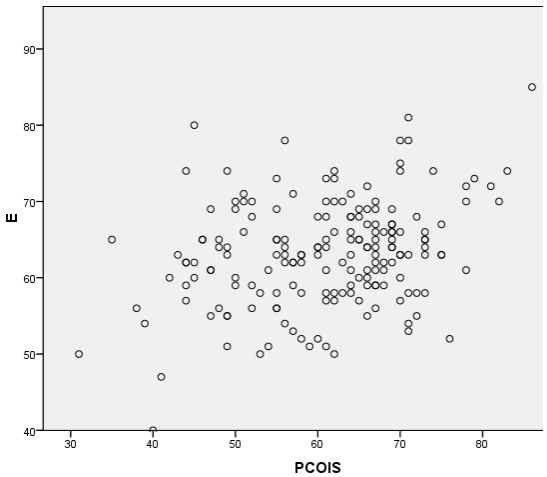
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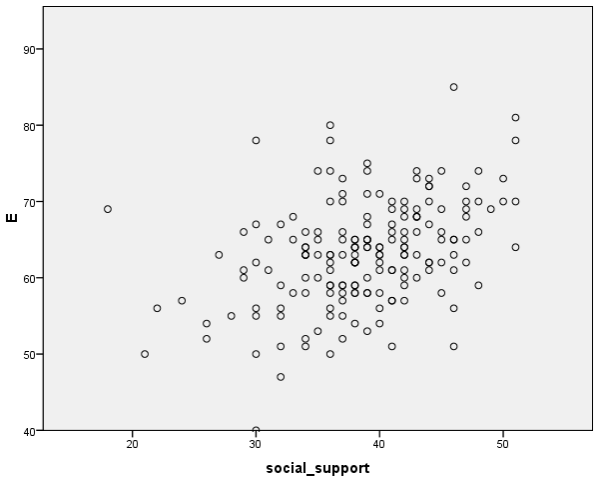
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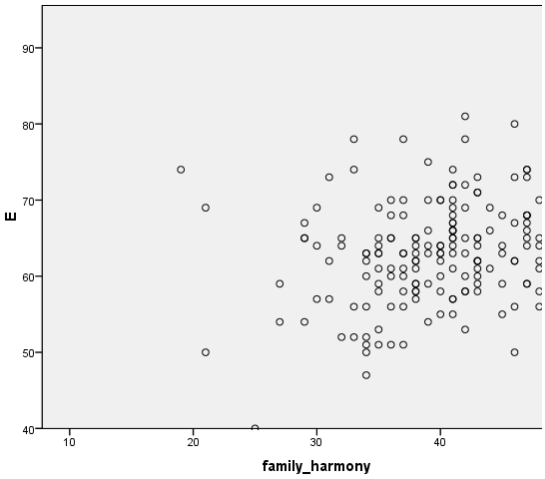
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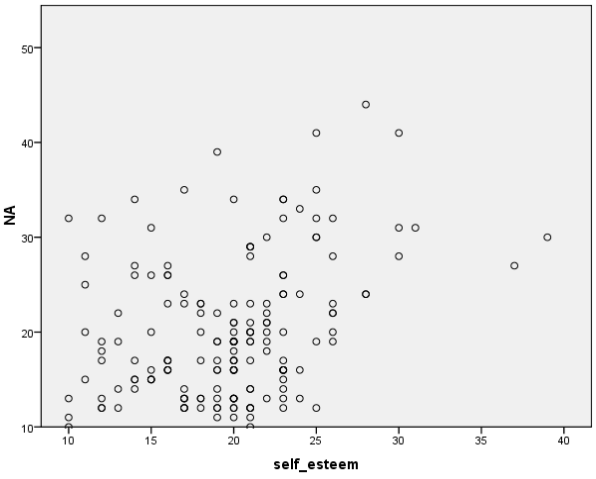
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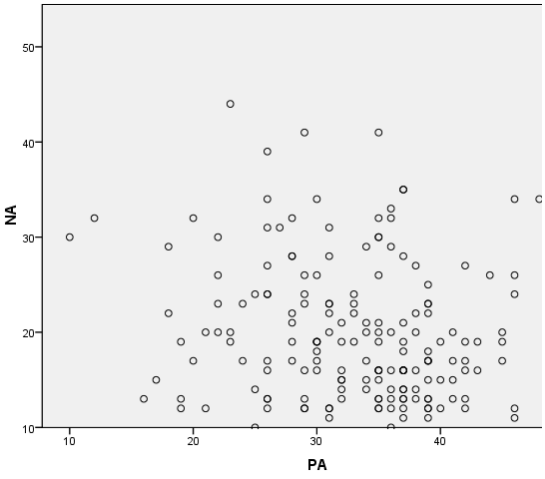
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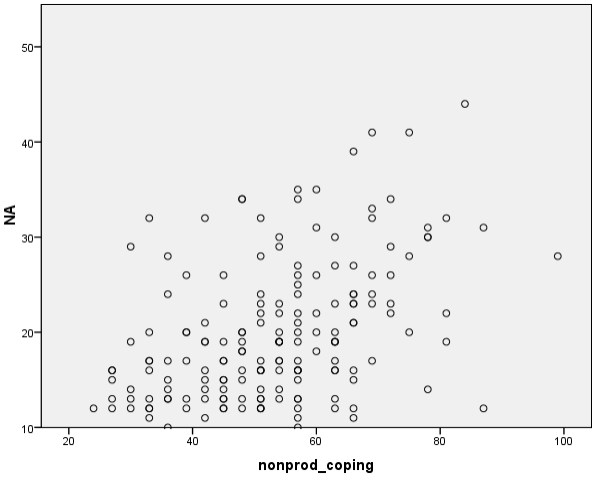
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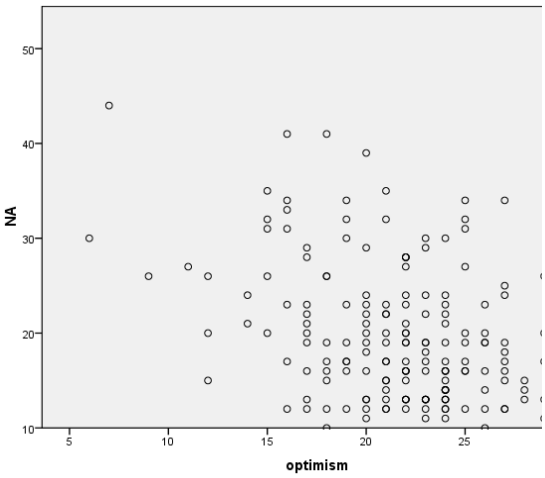
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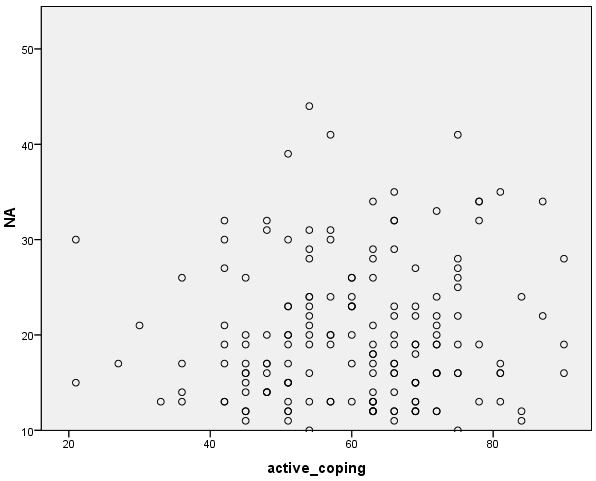
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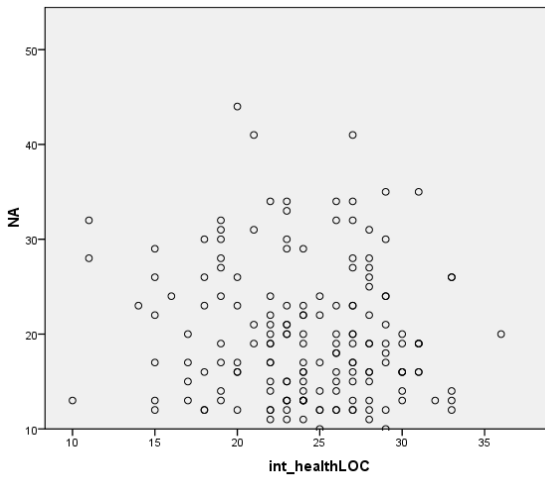
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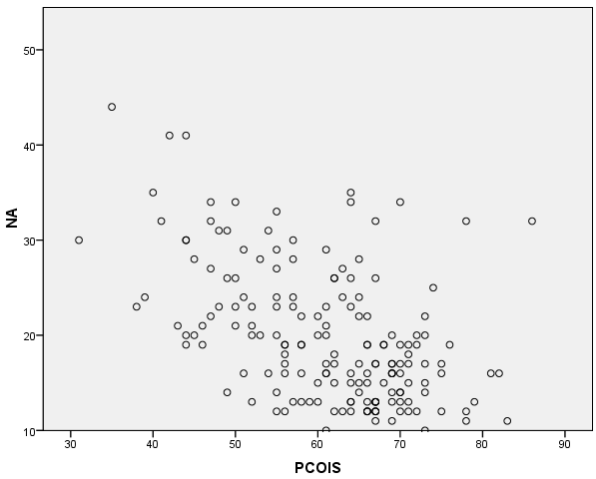
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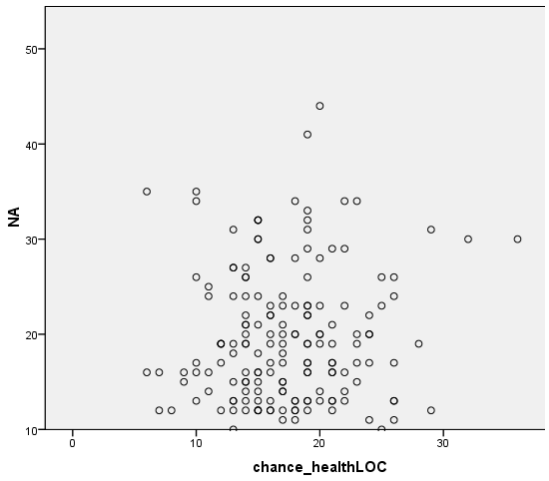
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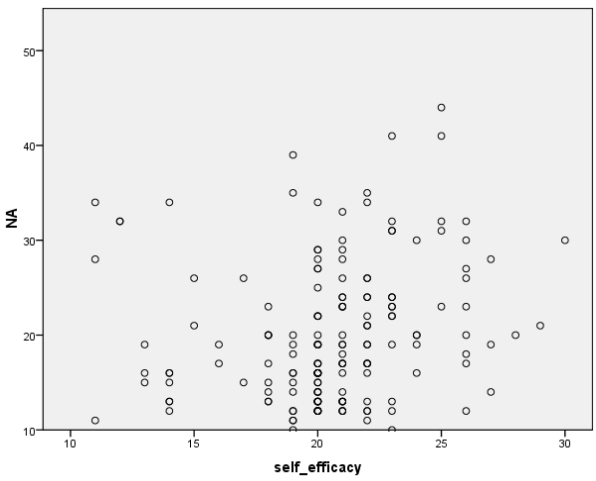
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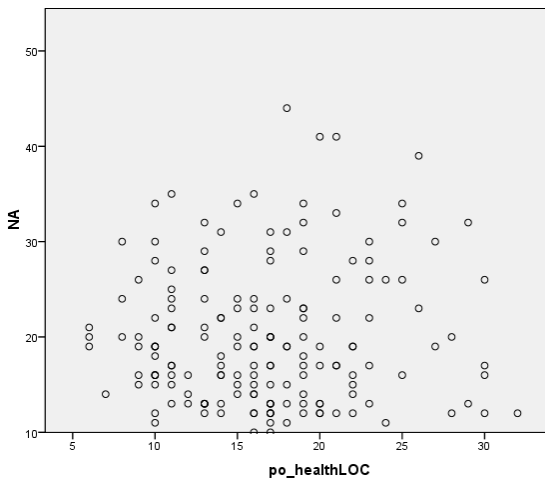
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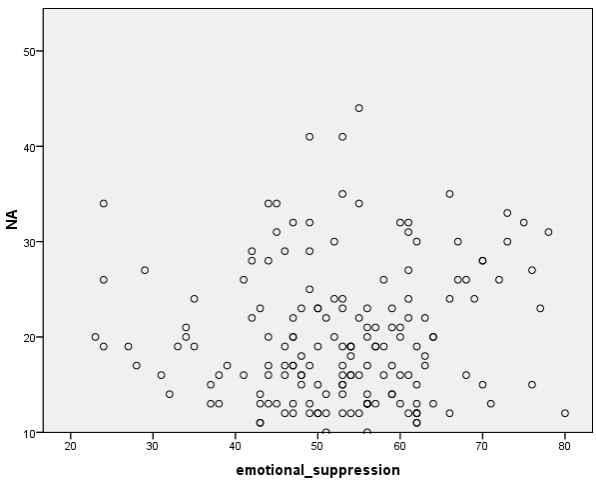
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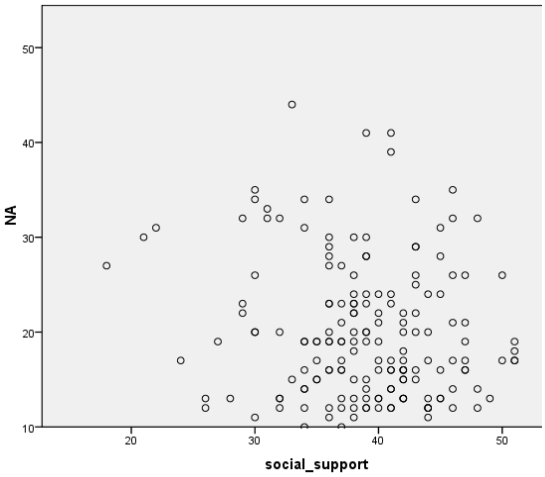
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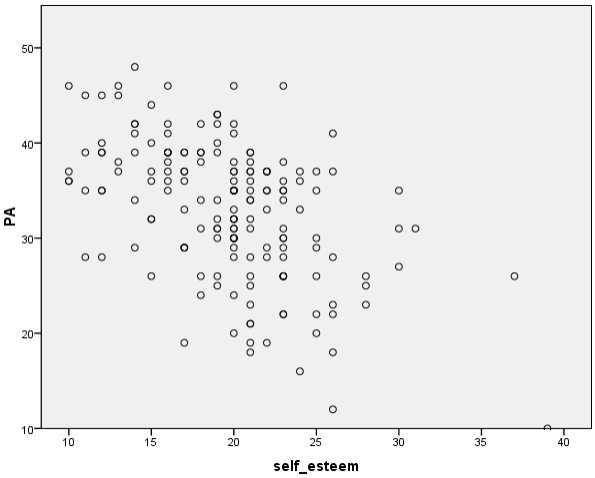
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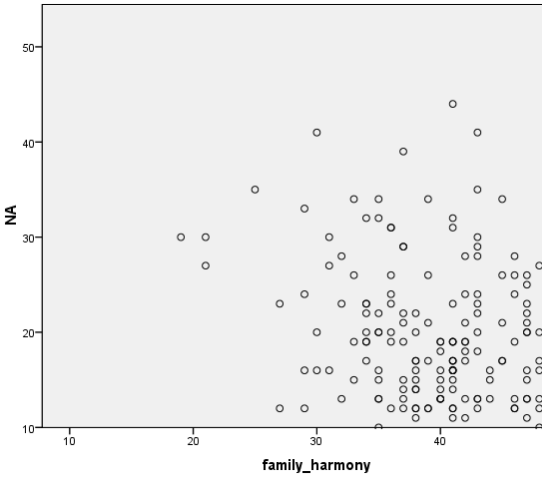
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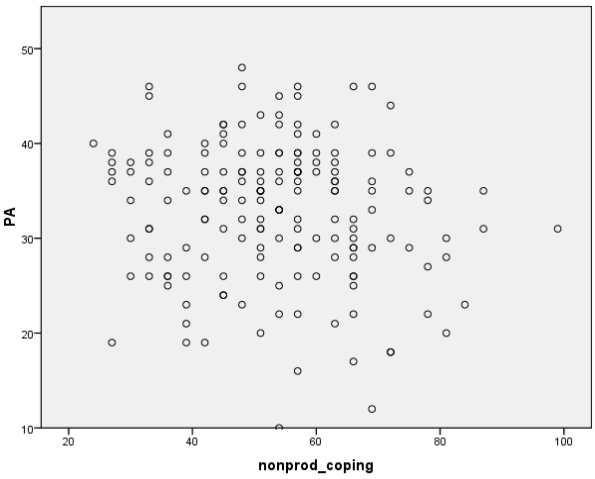
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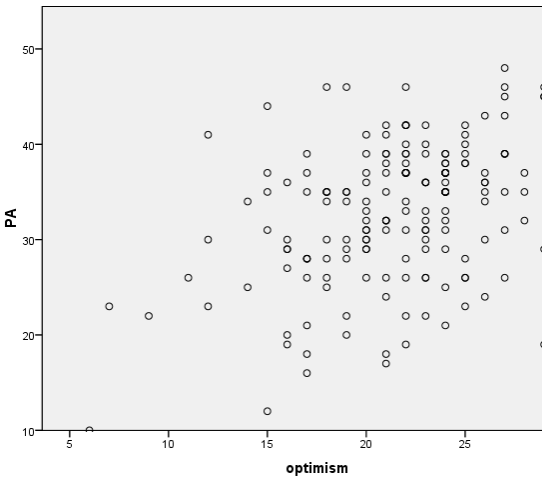
nonprod_coping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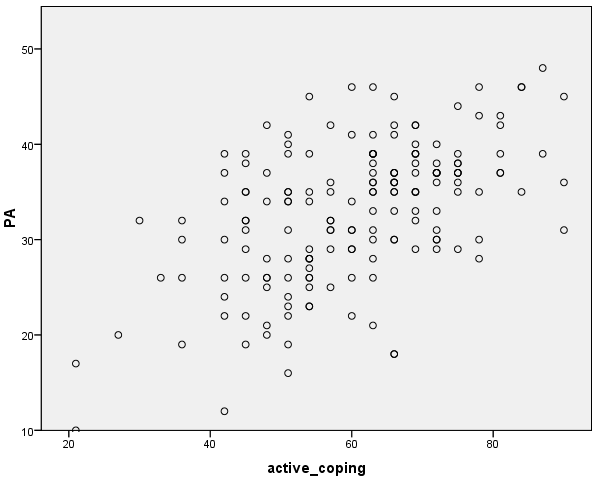
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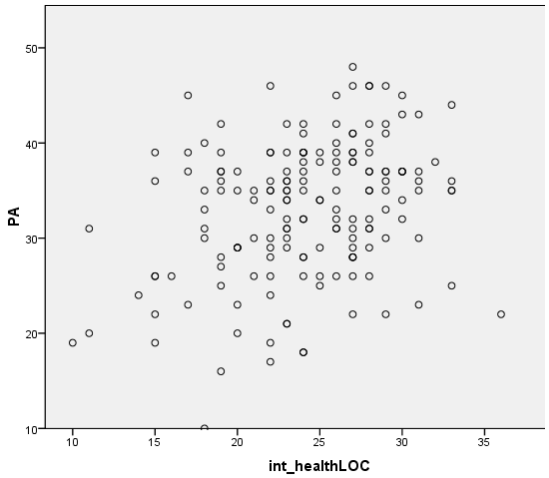
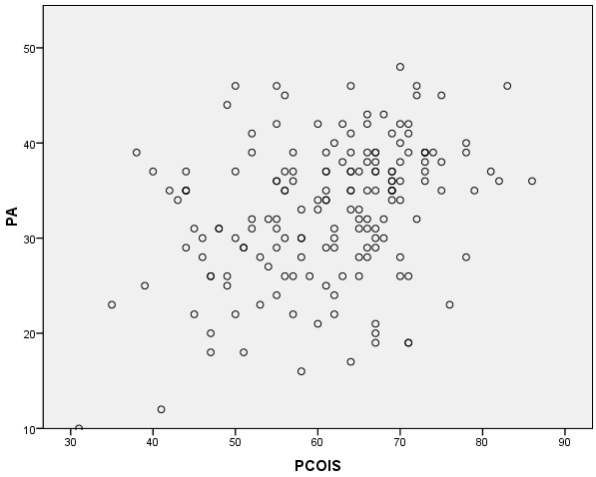

PA
int_healthLOC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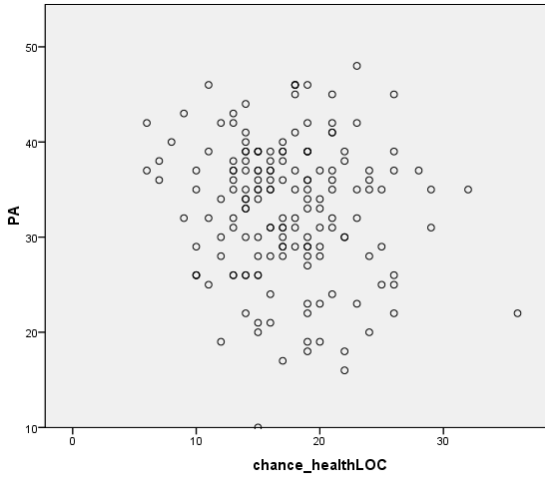
PCOIS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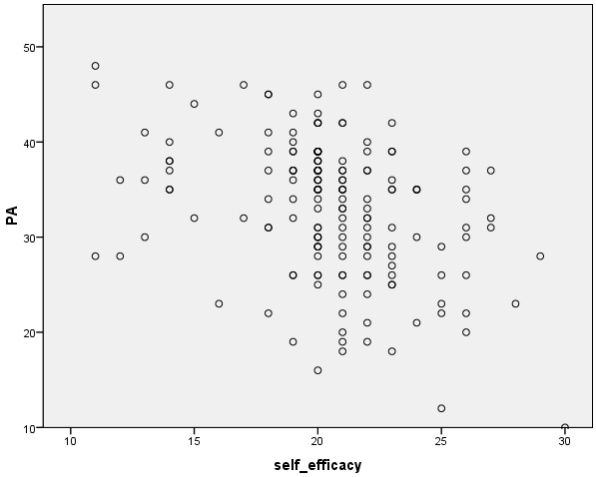
chance_healthLOC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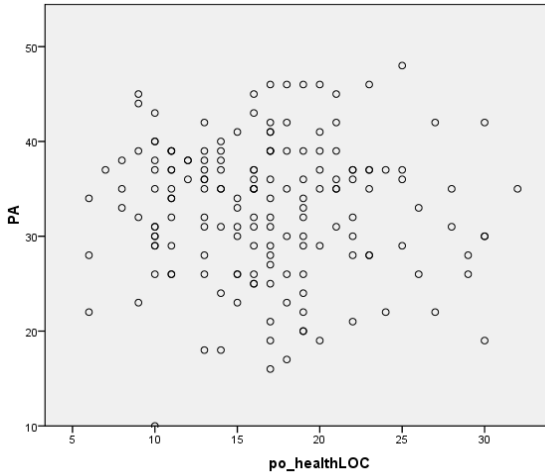
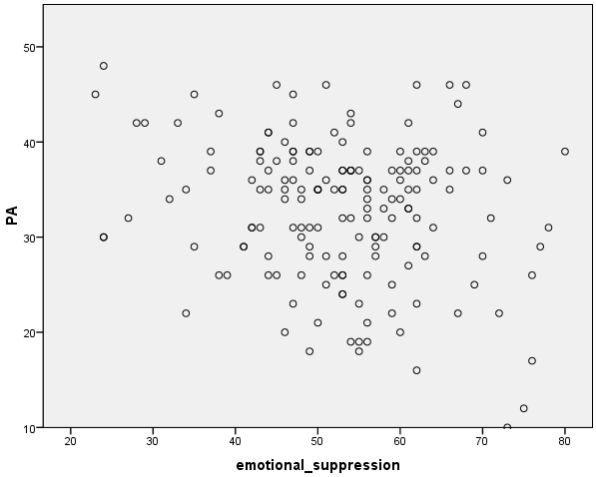

PA
po_healthLOC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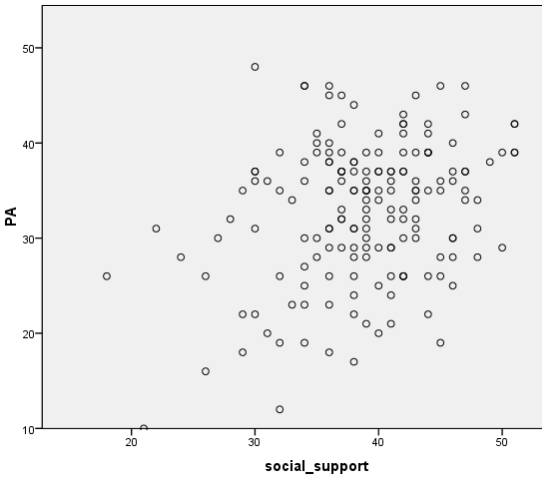
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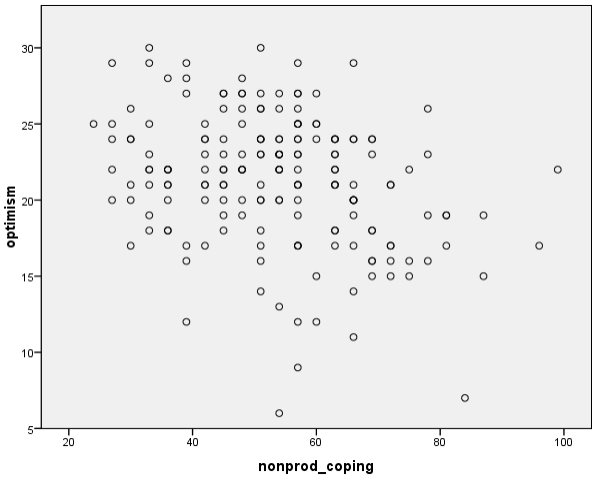
optimism
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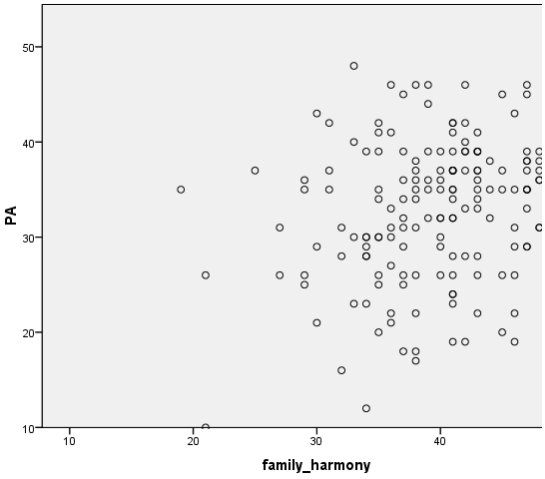
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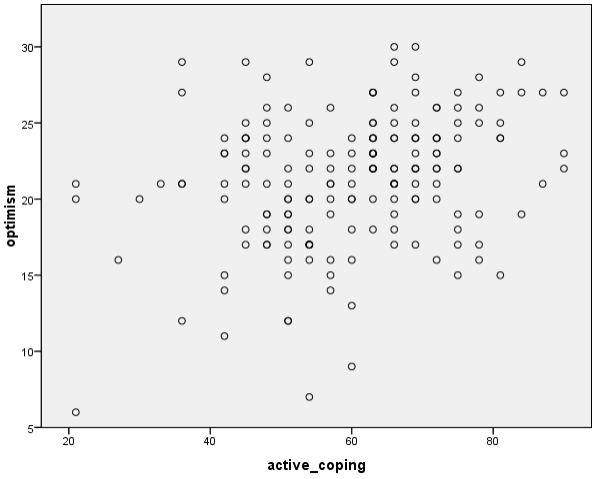
family_harmony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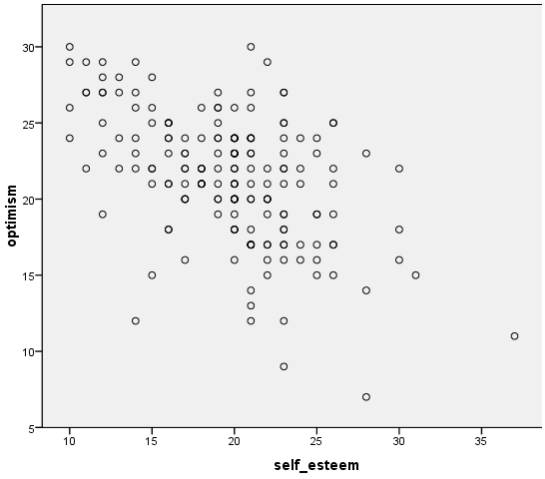
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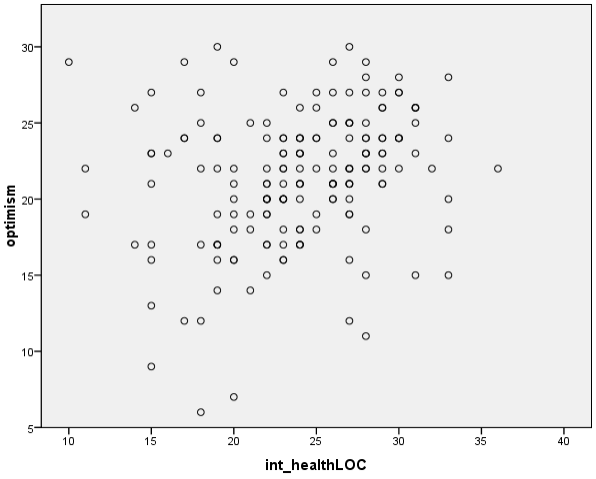
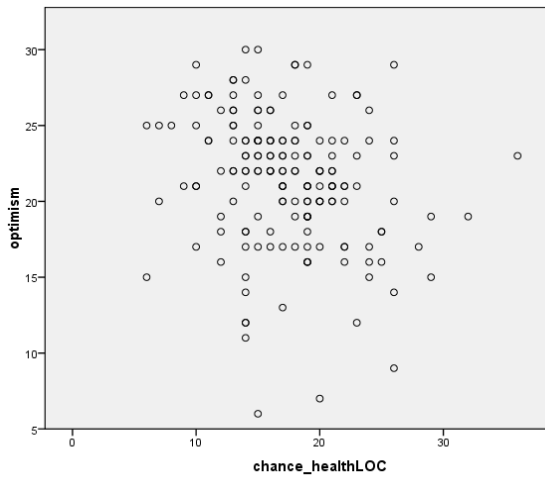
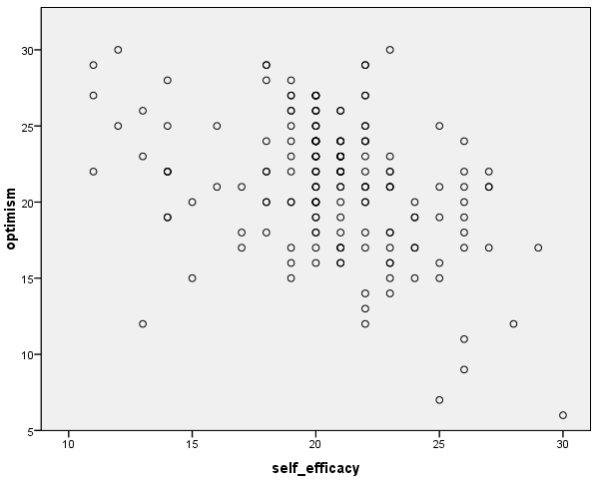

optimism
int_healthLOC


optimism
chance_healthLOC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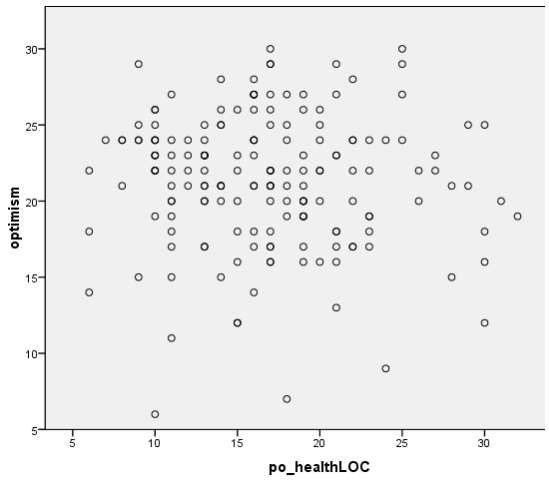
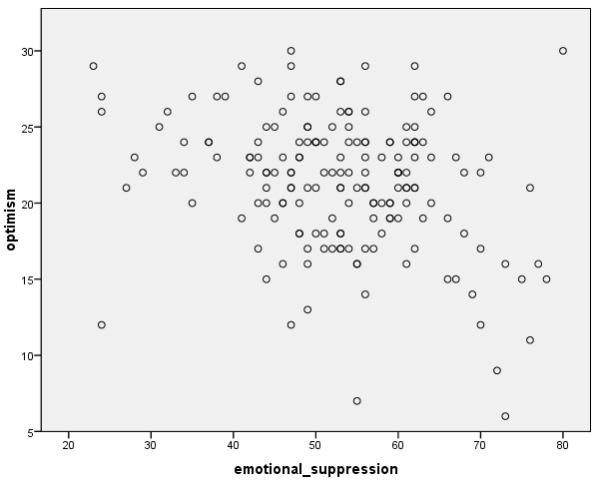

optimism
po_healthLOC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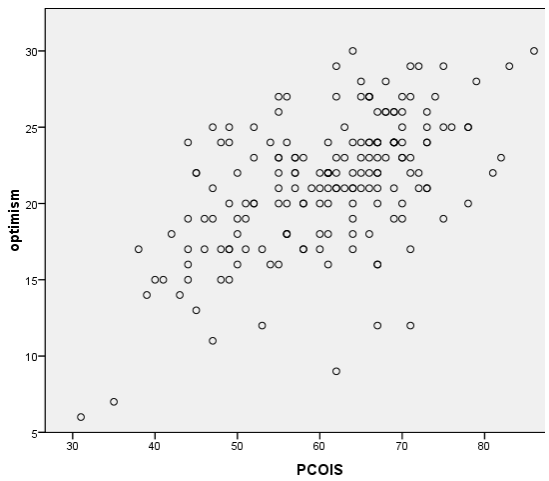
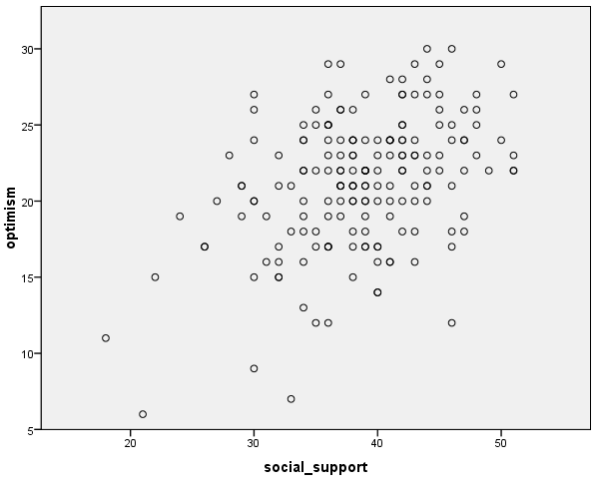
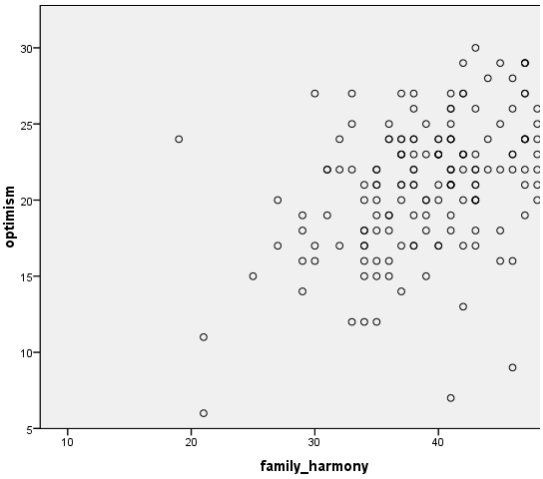
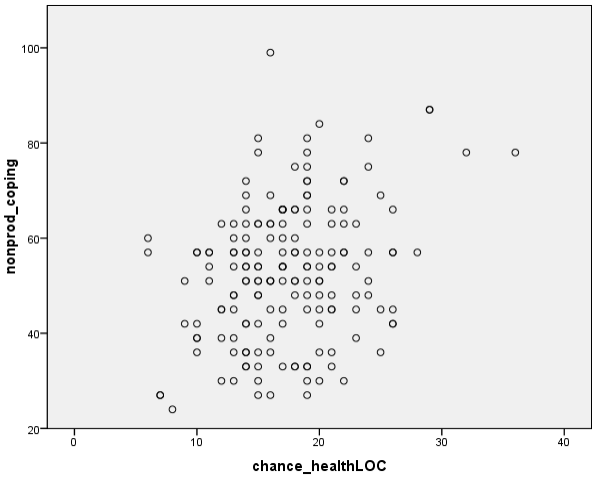
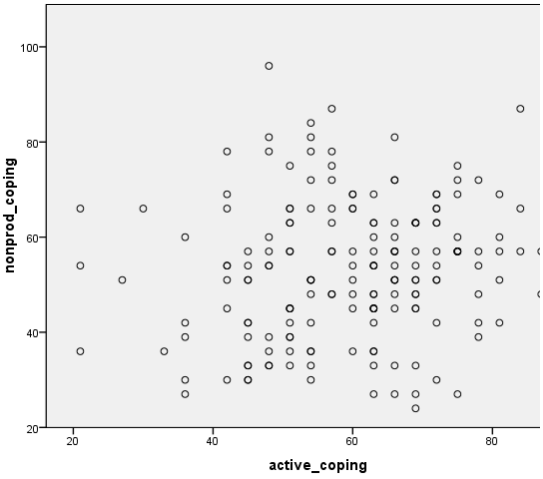
emotional_suppression


optimism
PCOIS


optimism
social_support


optimism
family_harmony


nonprod_coping
chance_healthLOC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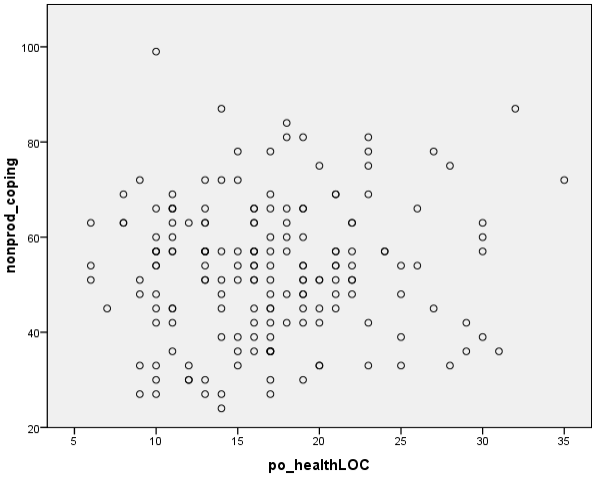
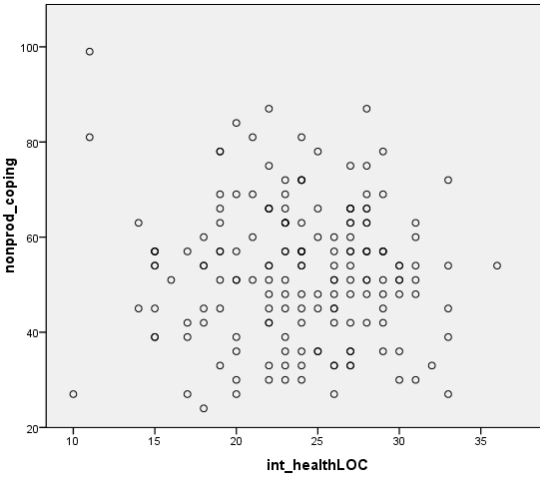
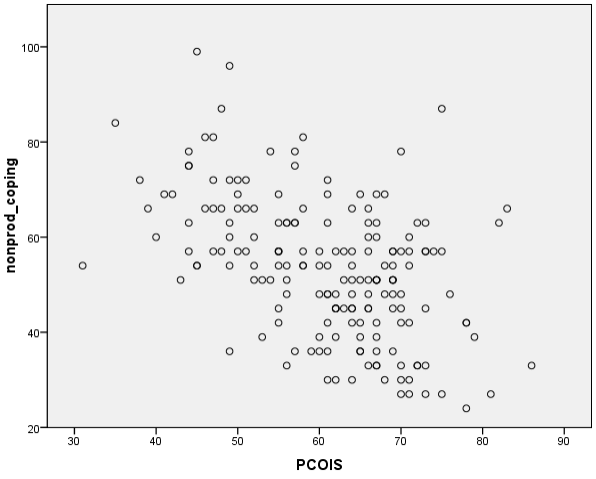
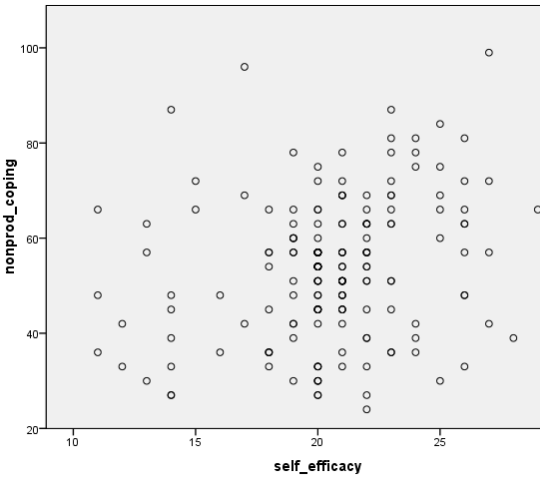
active_coping


nonprod_coping
po_healthLOC


nonprod_coping
int_healthLOC


nonprod_coping
PCOIS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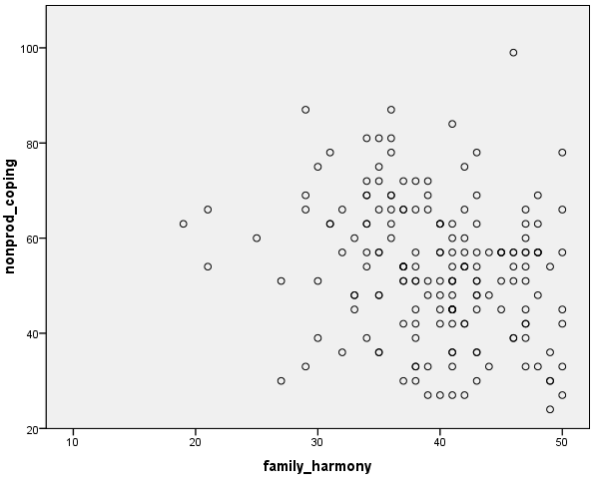
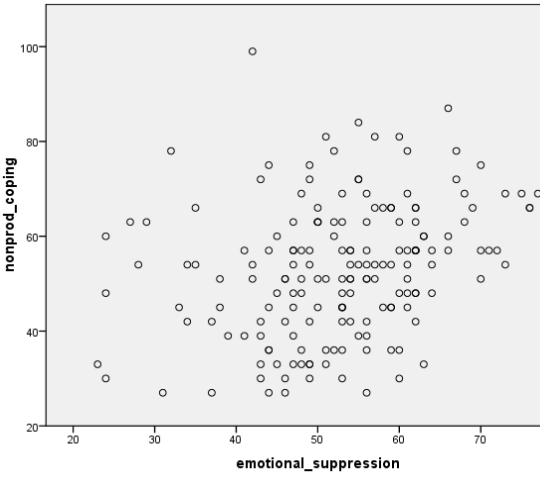
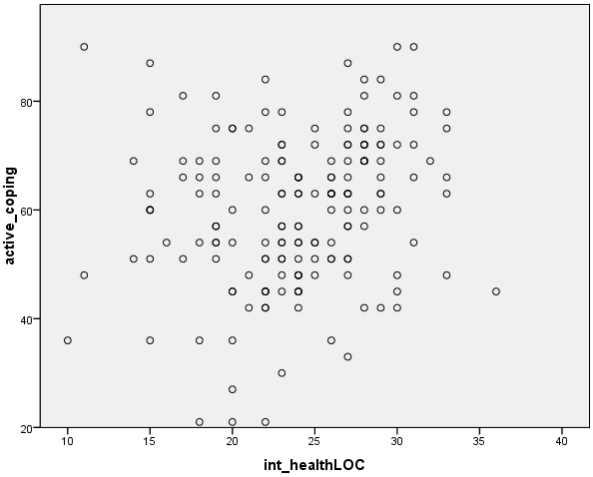
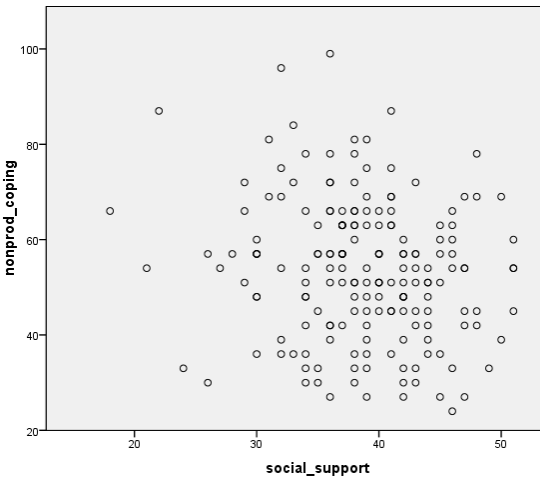
self_efficacy


nonprod_coping
family_harmony


nonprod_coping
emotional_suppression


active_coping
int_healthLOC


nonprod_coping
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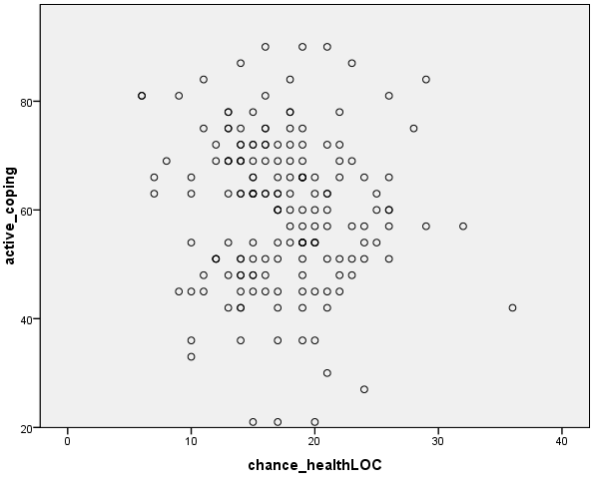
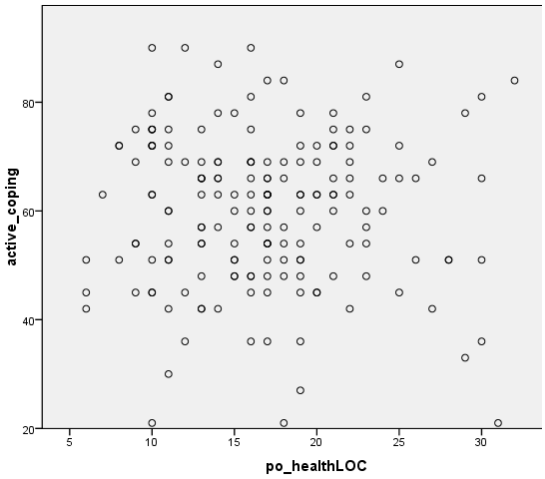
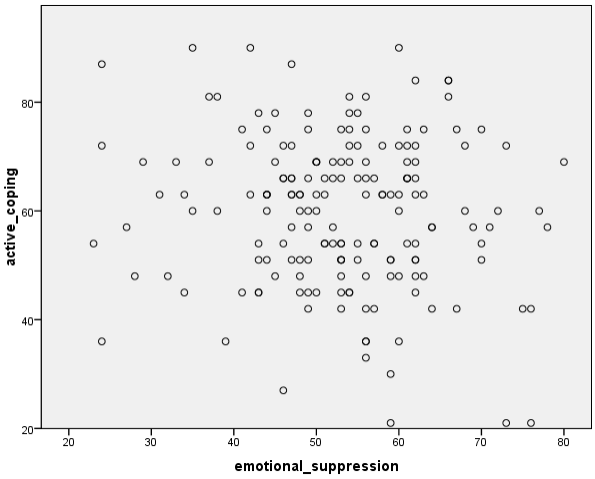

active_coping
chance_healthLOC


active_coping
po_healthLOC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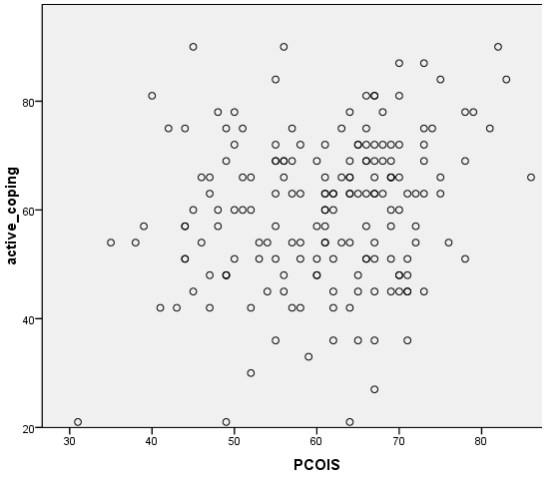
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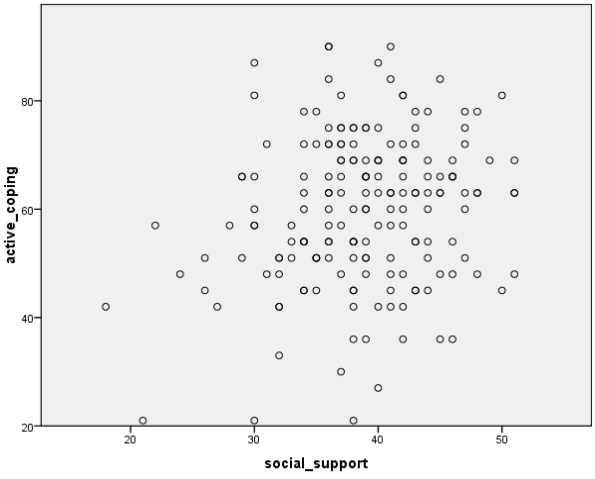
active_coping
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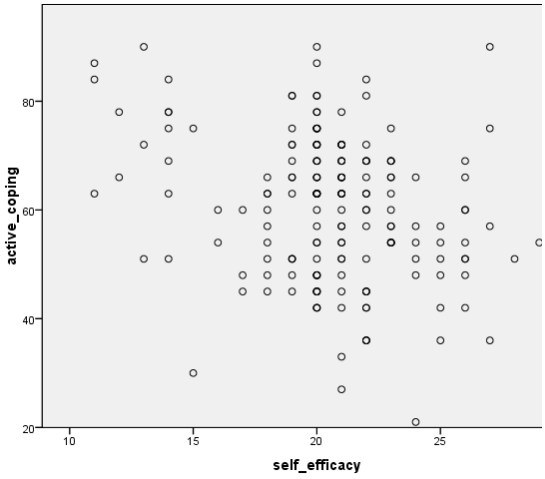
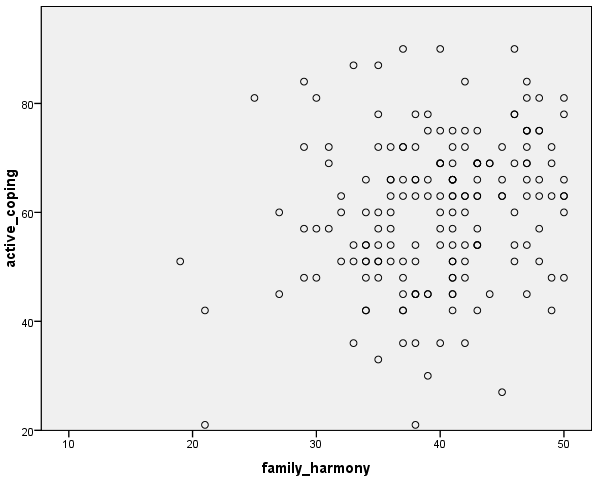
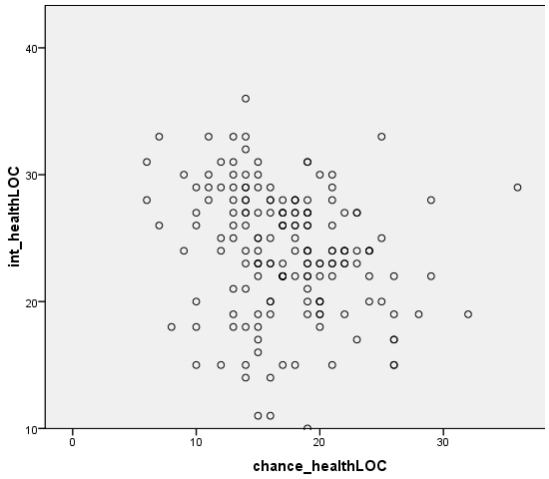
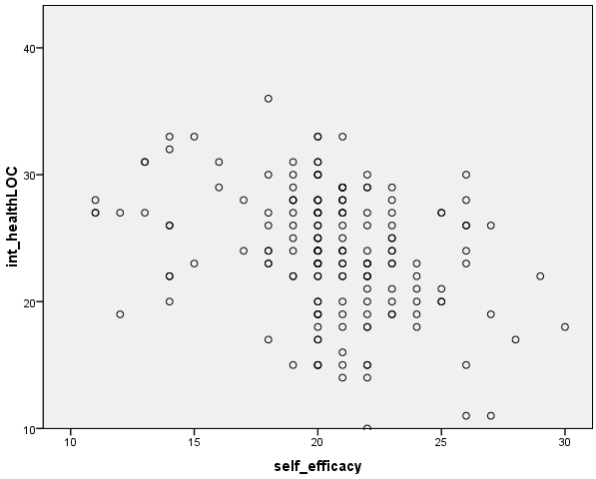
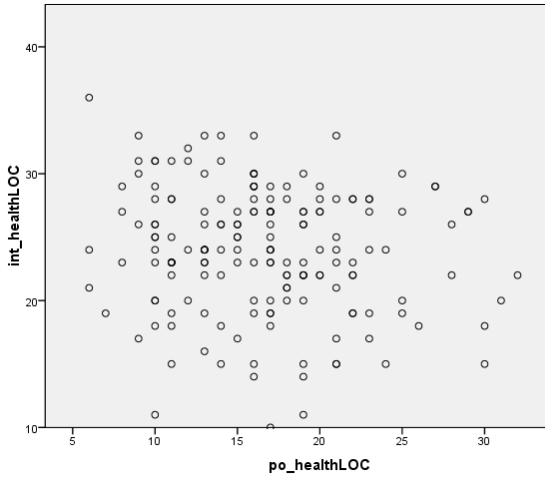
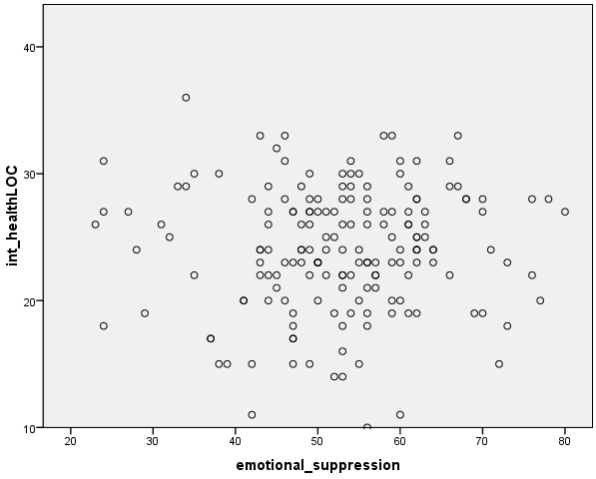

active_coping
self_efficacy

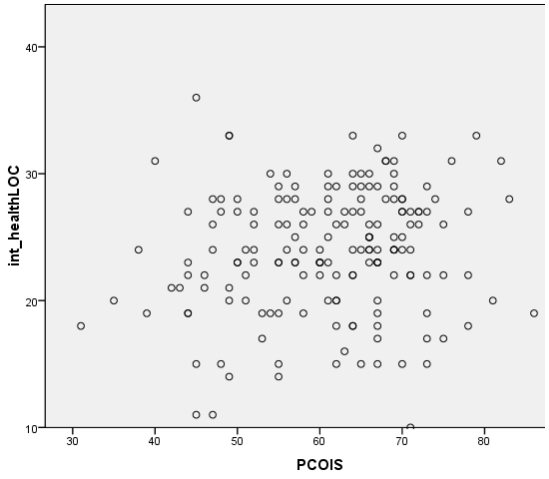

active_coping
family_harmony

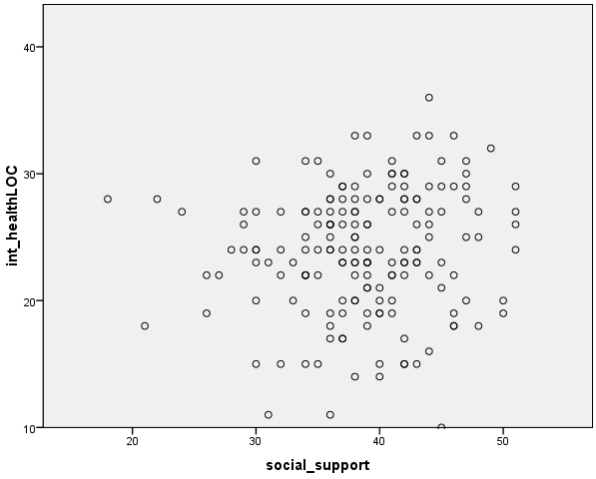

int_healthLOC
chance_healthLOC

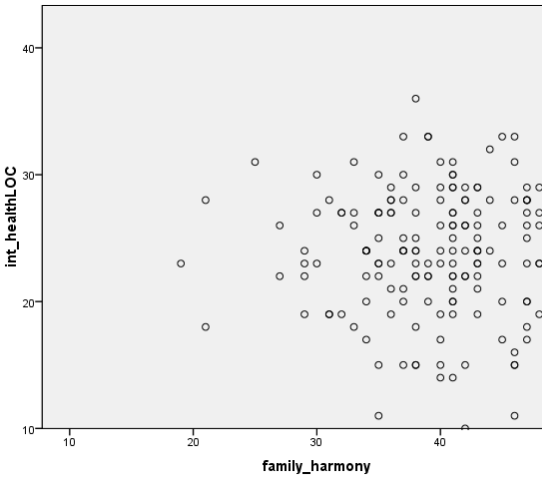

int_healthLOC
self_efficacy

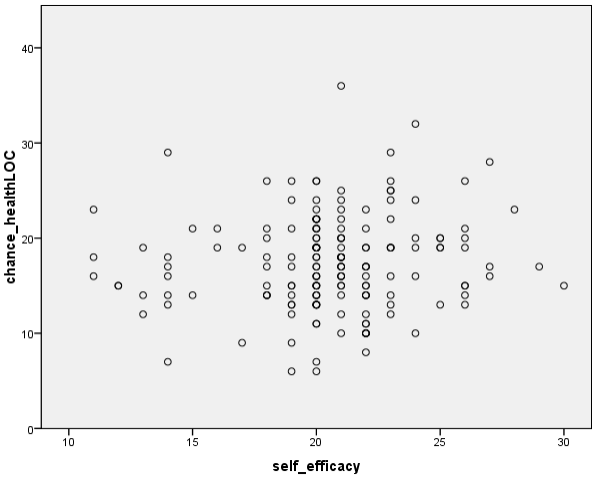

int_healthLOC
po_healthLOC

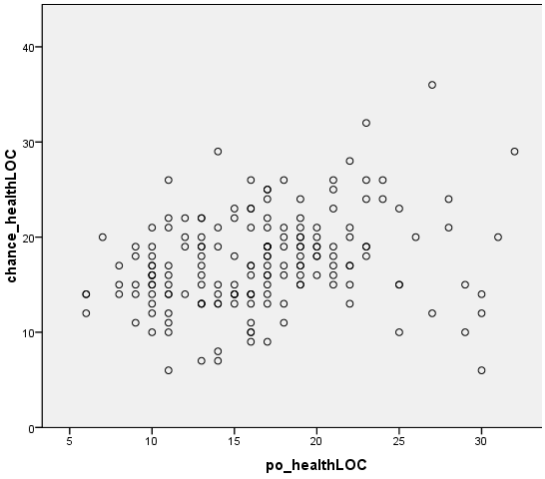

int_healthLOC
emotional_suppression

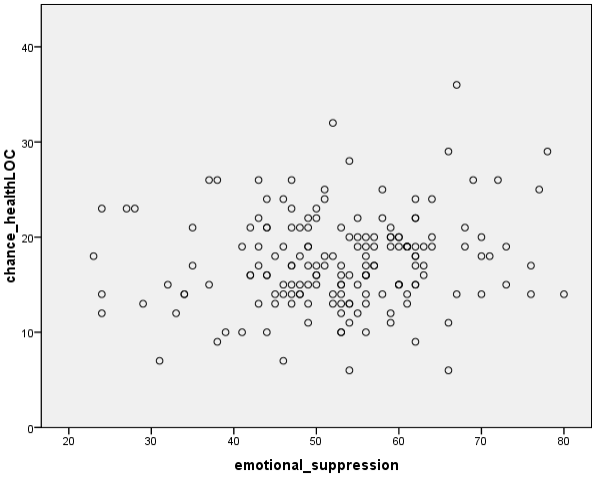

int_healthLOC
PCOIS

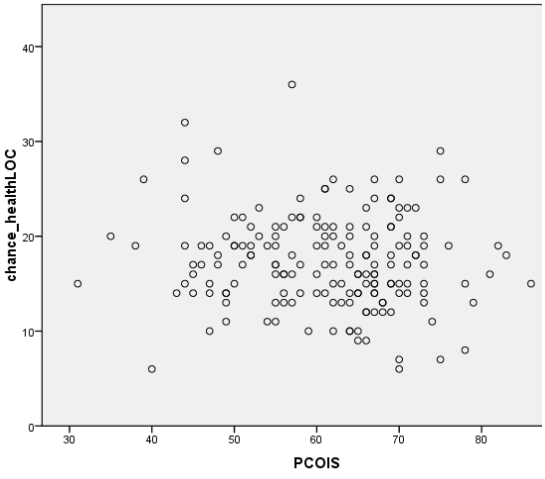

int_healthLOC
social_support

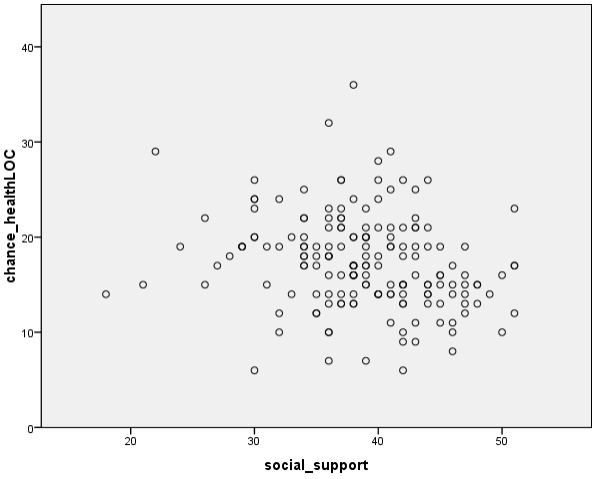

int_healthLOC
family_harmony

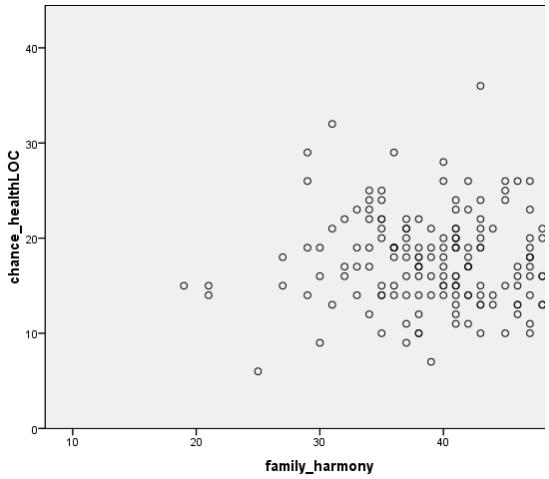

chance_healthLOC
self_efficacy

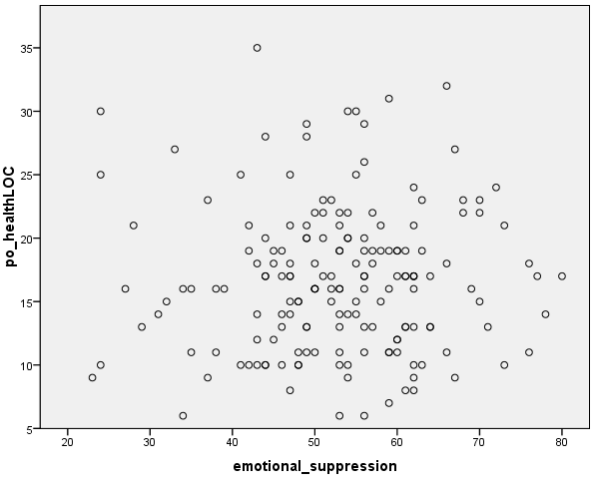

chance_healthLOC
po_healthLOC

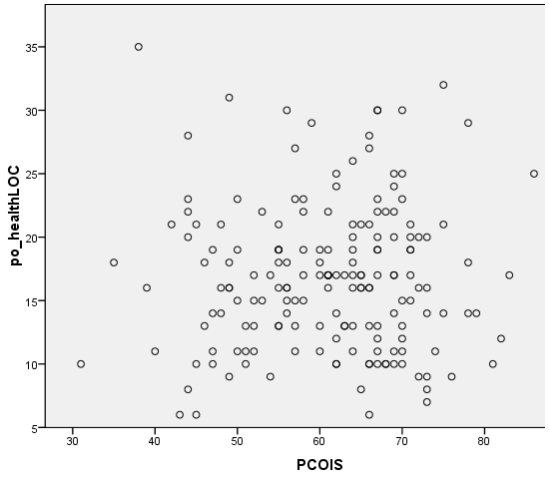

chance_healthLOC
emotional_suppression

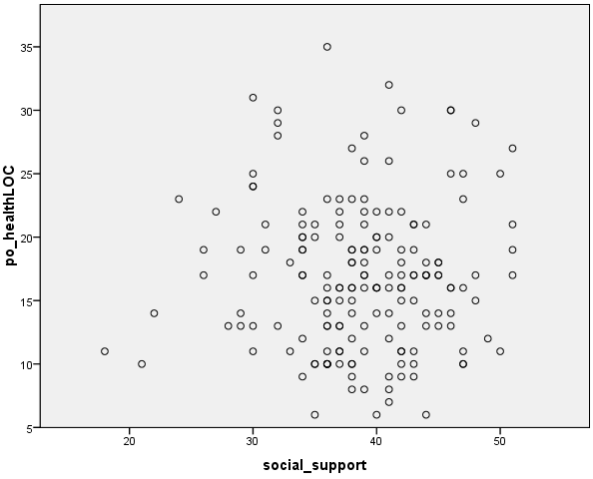

chance_healthLOC
PCOIS

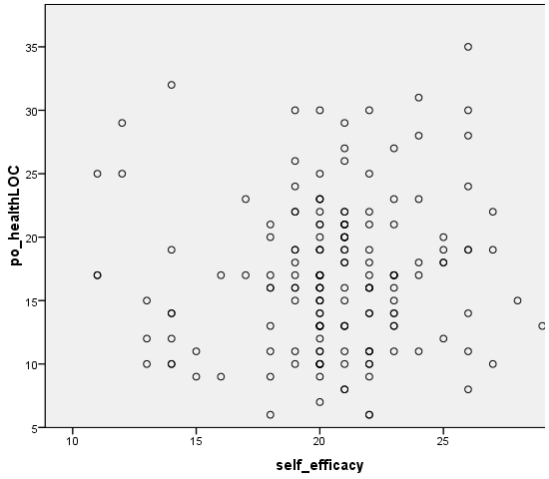

chance_healthLOC
social_support

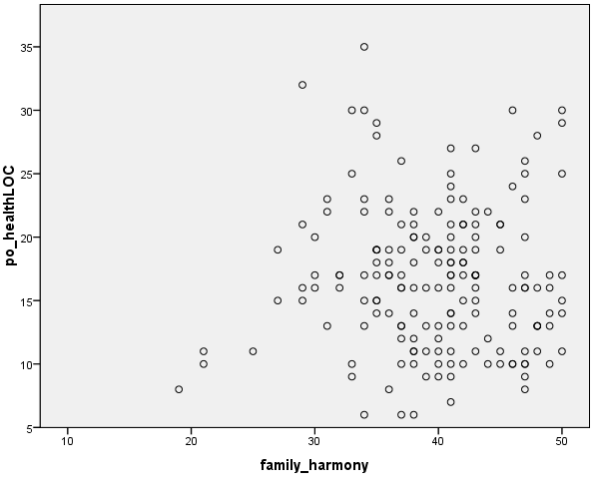

chance_healthLOC
family_harmony

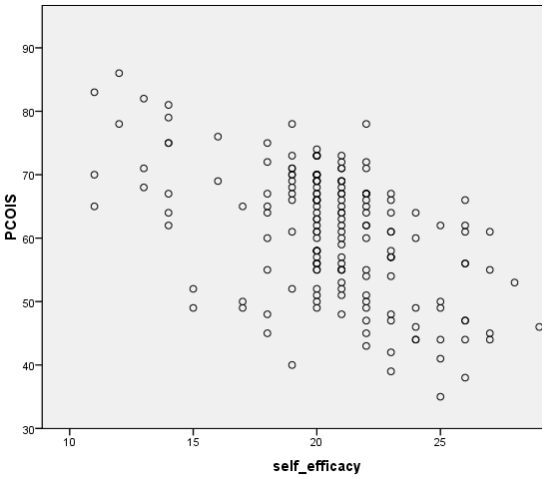

po_healthLOC
emotional_suppression

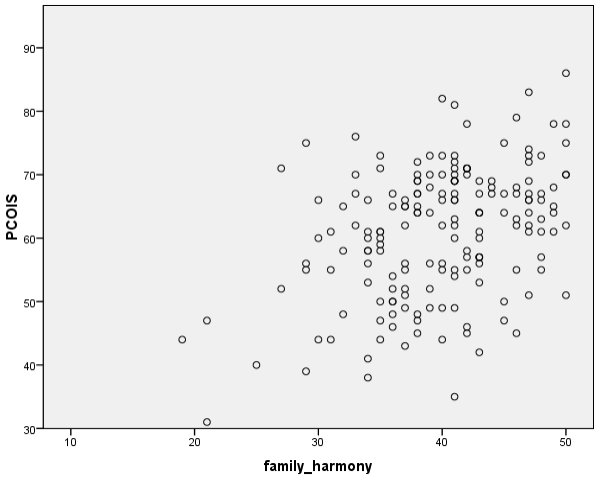

po_healthLOC
PCOIS

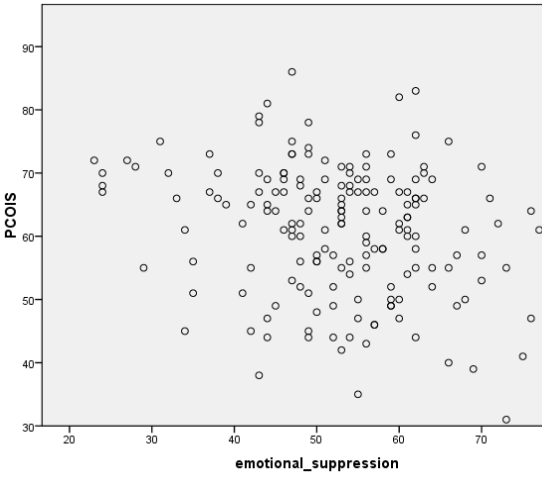

po_healthLOC
social_support

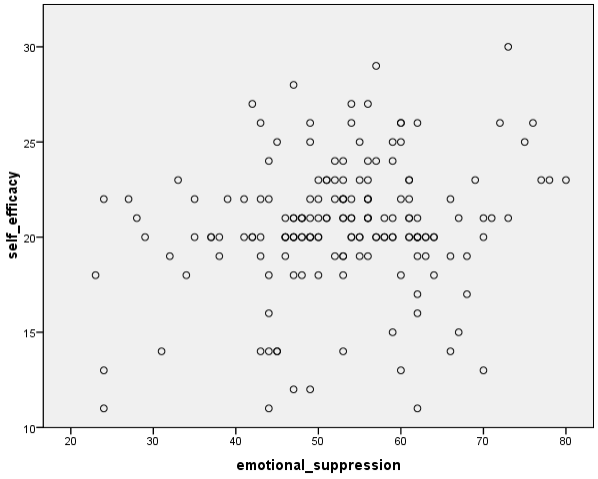

po_healthLOC
self_efficacy

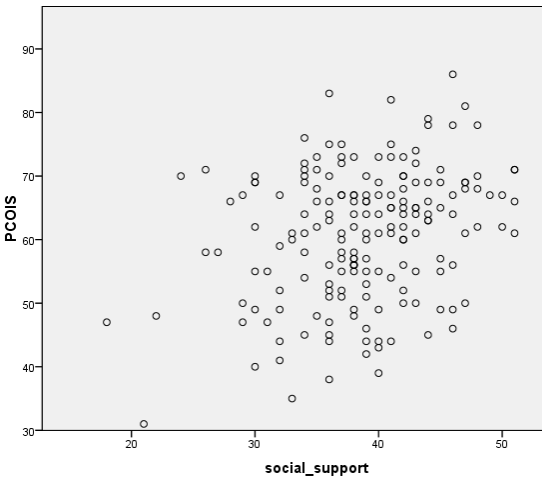

po_healthLOC
family_harmony

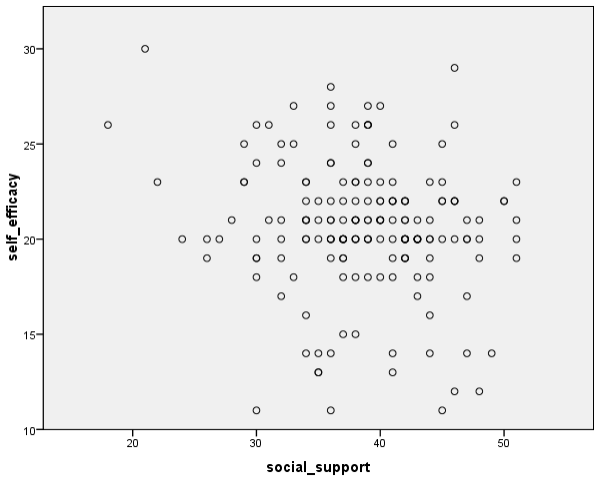

PCOIS
self_efficacy

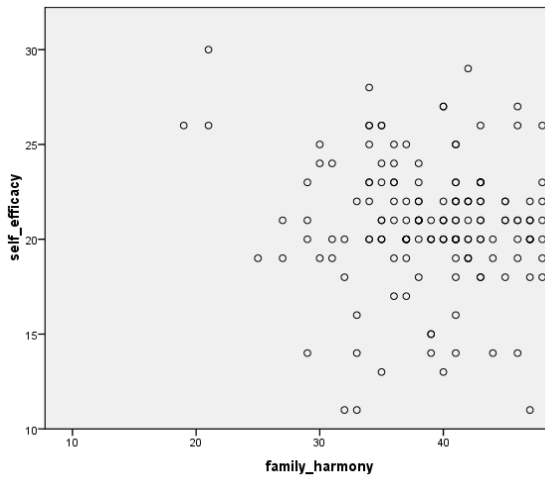

PCOIS
family_harmony

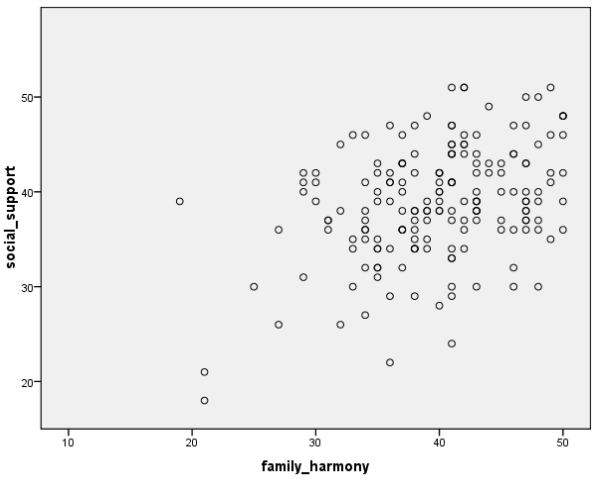

PCOIS
emotional_suppression

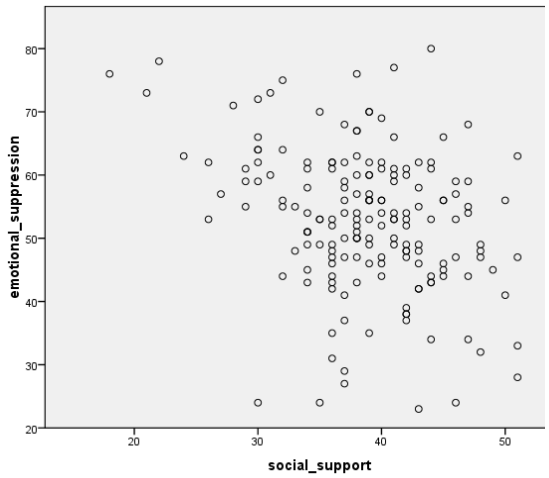

self_efficacy
emotional_suppression

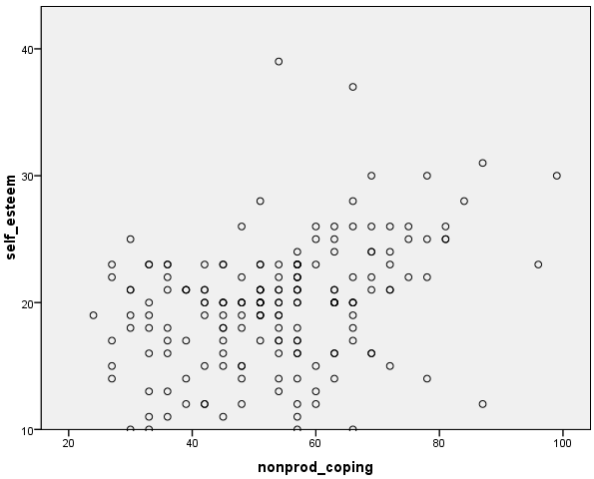

PCOIS
social_support

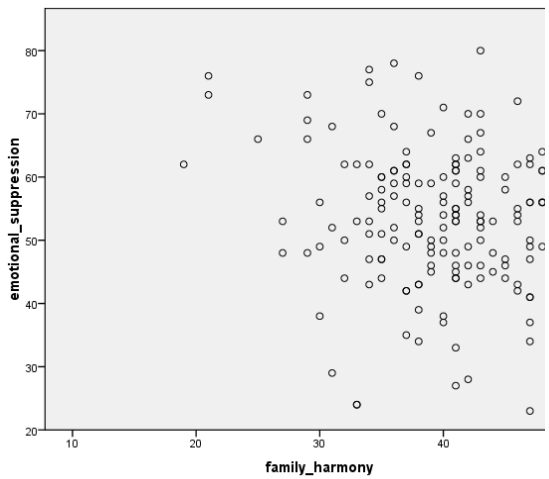

self_efficacy
social_support

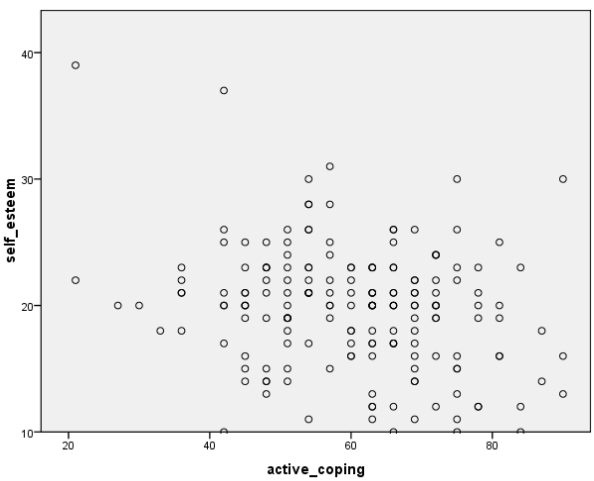

self_efficacy
family_harmony

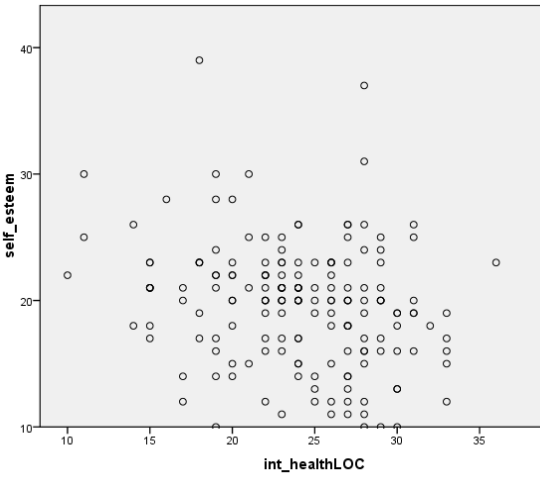

social_support
family_harmony

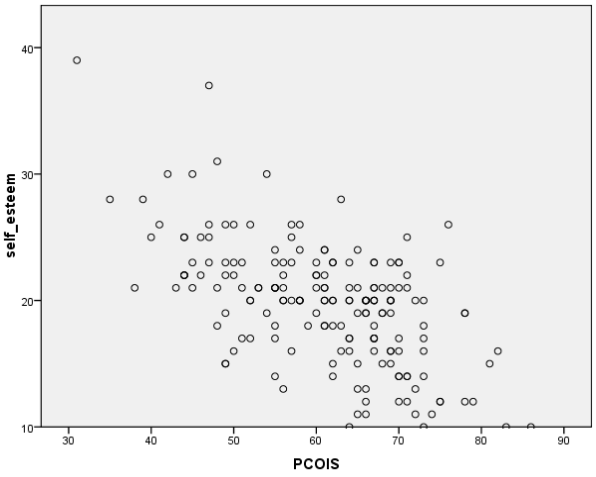

emotional_suppression
social_support

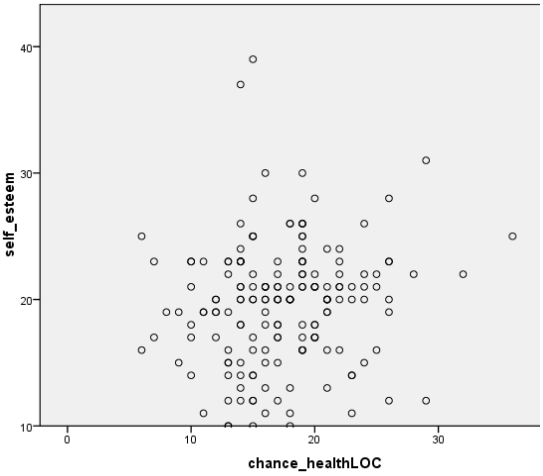

self_esteem
nonprod_coping

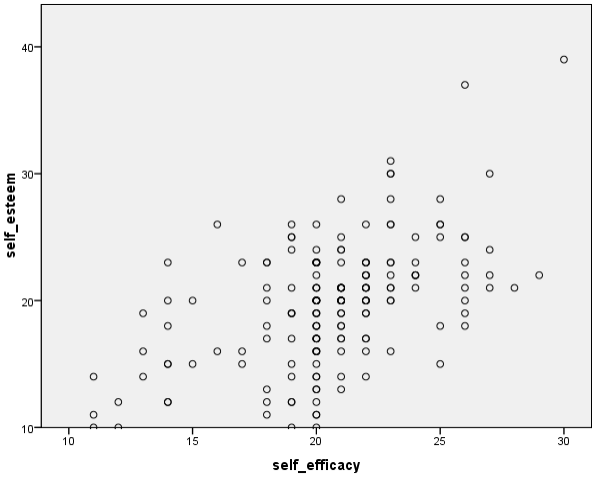

emotional_suppression
family_harmony

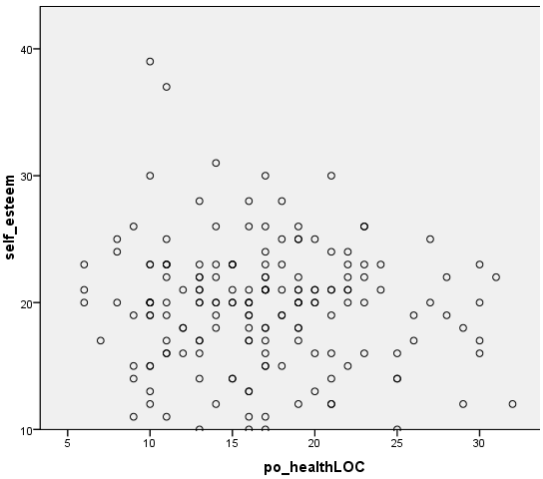

self_esteem
active_coping

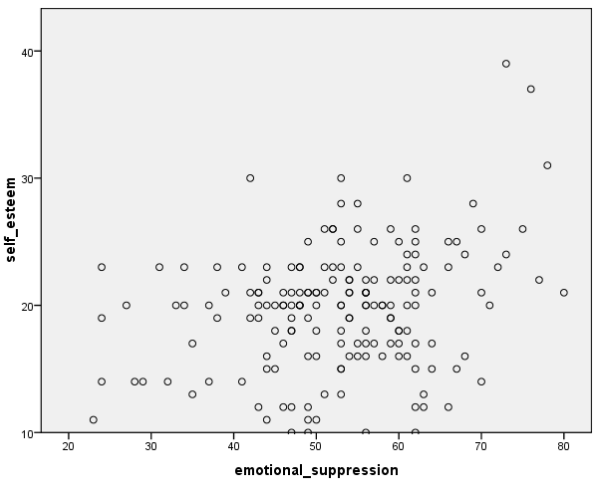

self_esteem
int_healthLOC

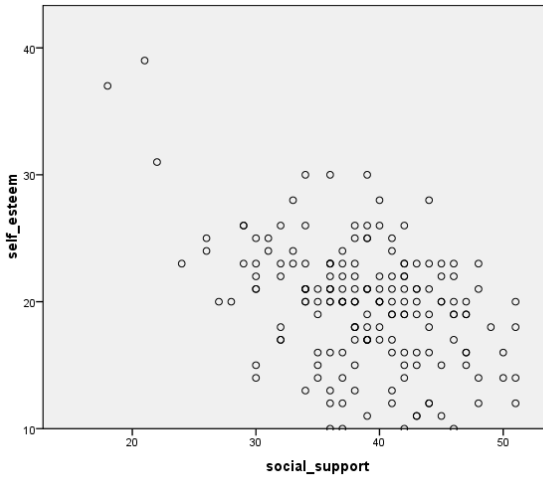

self_esteem
PCOIS

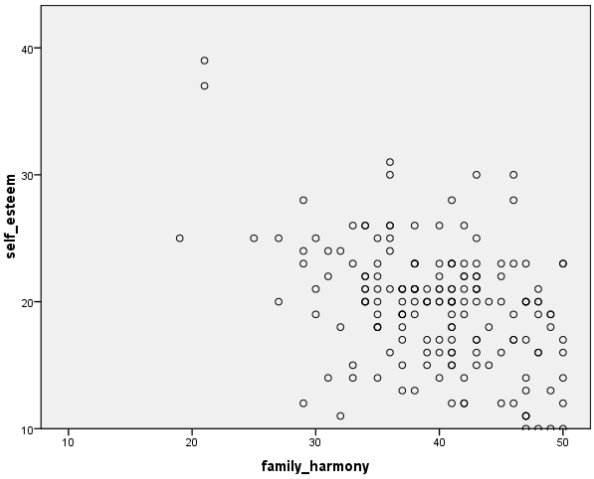

self_esteem
chance_healthLOC


self_esteem
self_efficacy

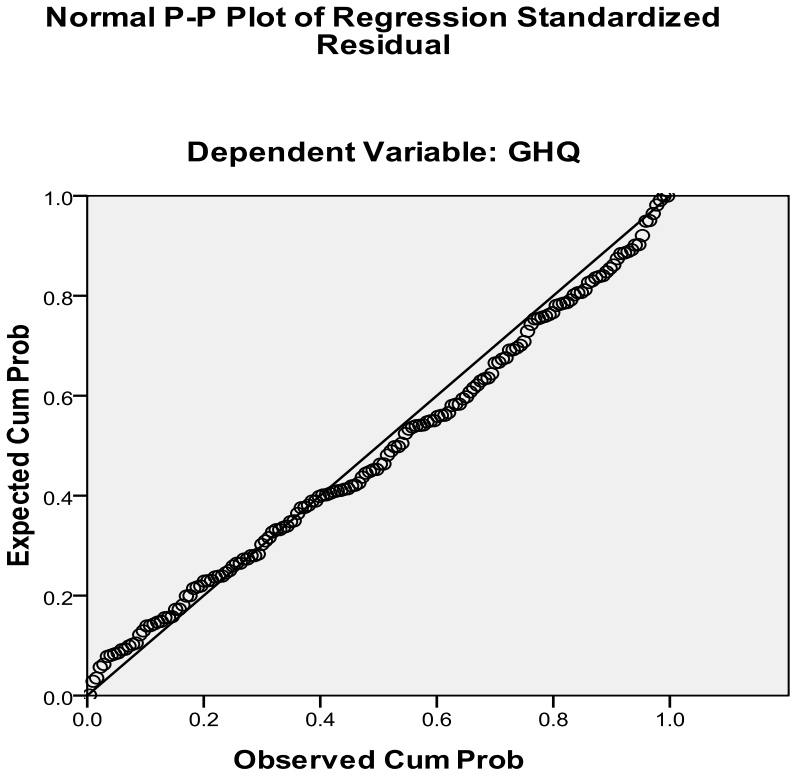

self_esteem
po_healthLOC

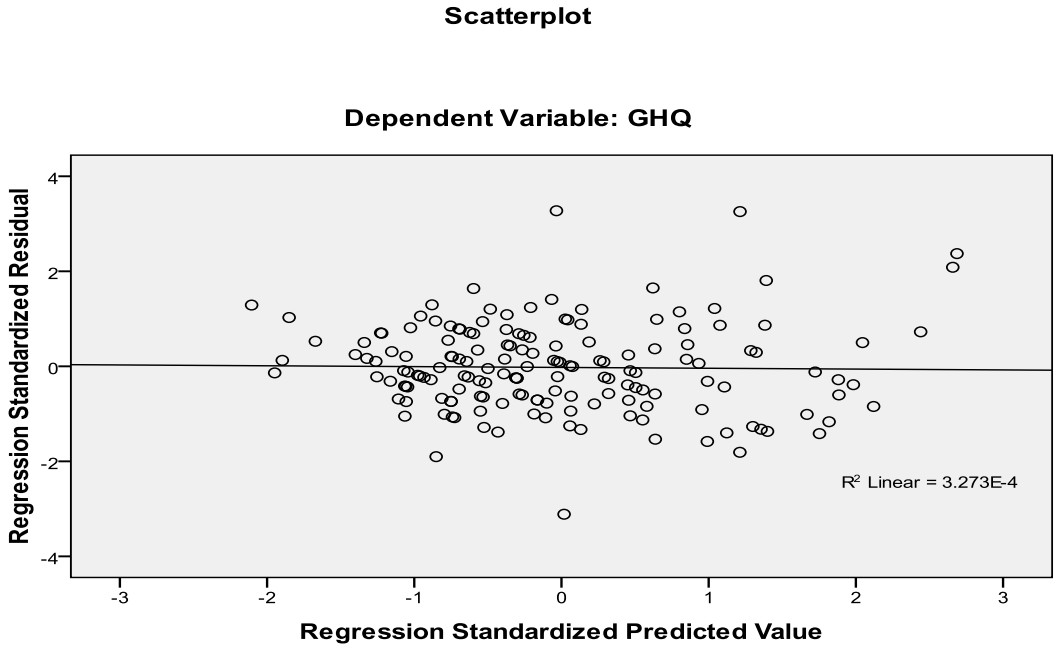

self_esteem
emotional_suppression

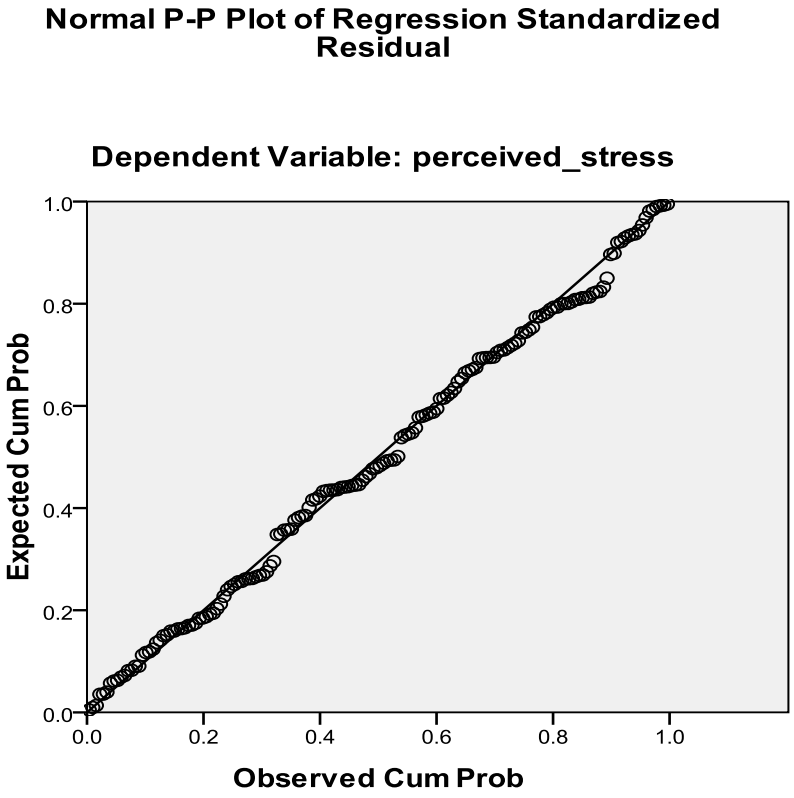

self_esteem
social_support
40
30
20
10
20
30
40
50

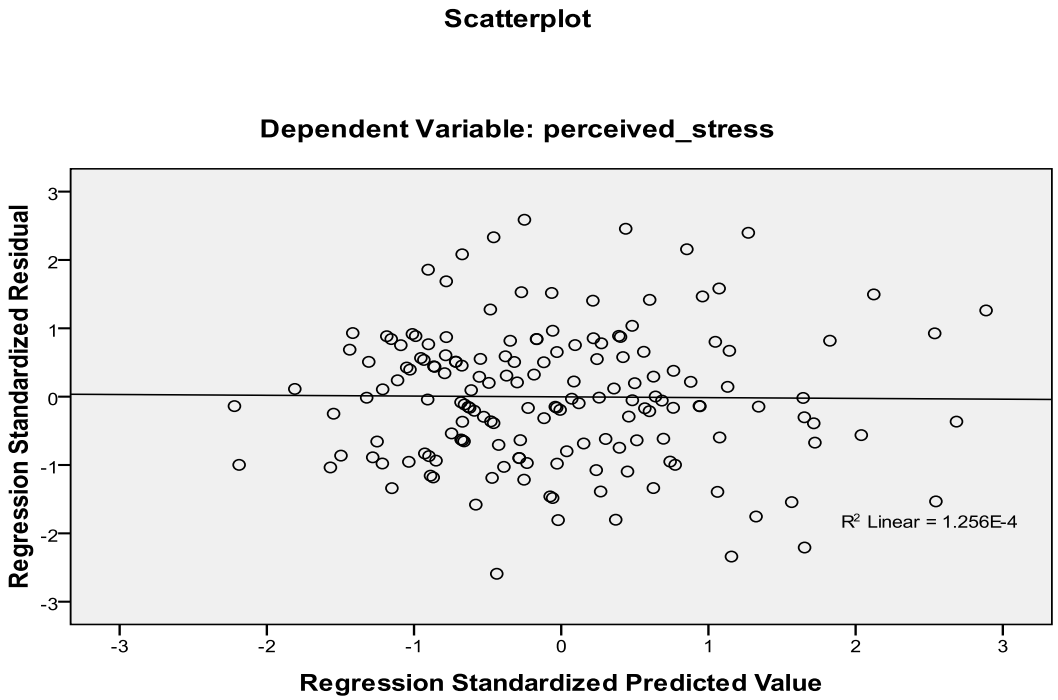

self_esteem
family_harmony
40
30
20
10
10
20
30
40
50

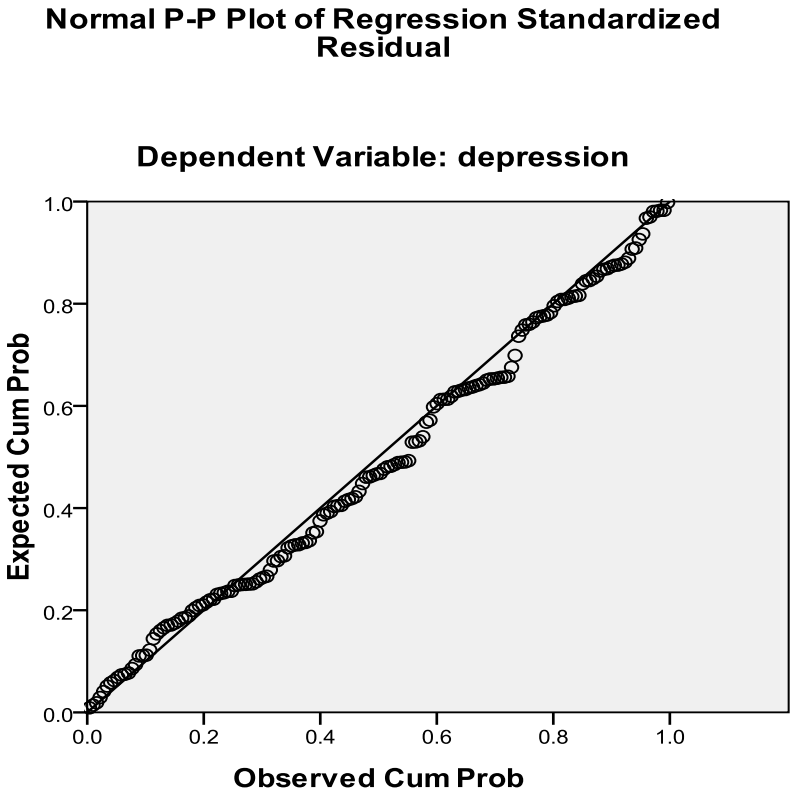
Appendix D: Residuals Scatterplot, Normal Probability Plot of Regression Standardized Residuals

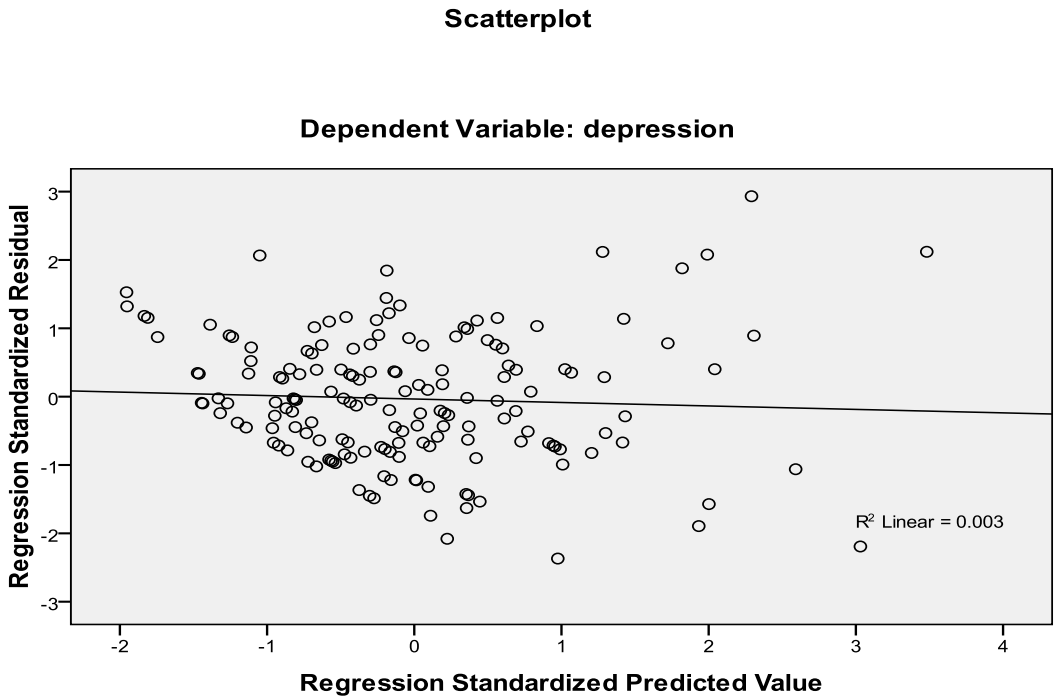


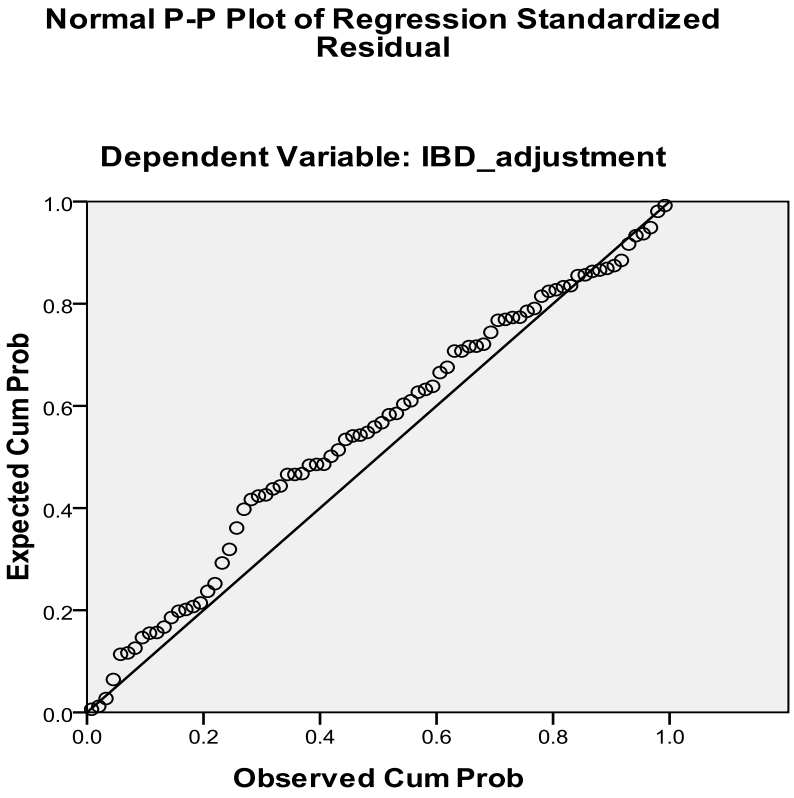


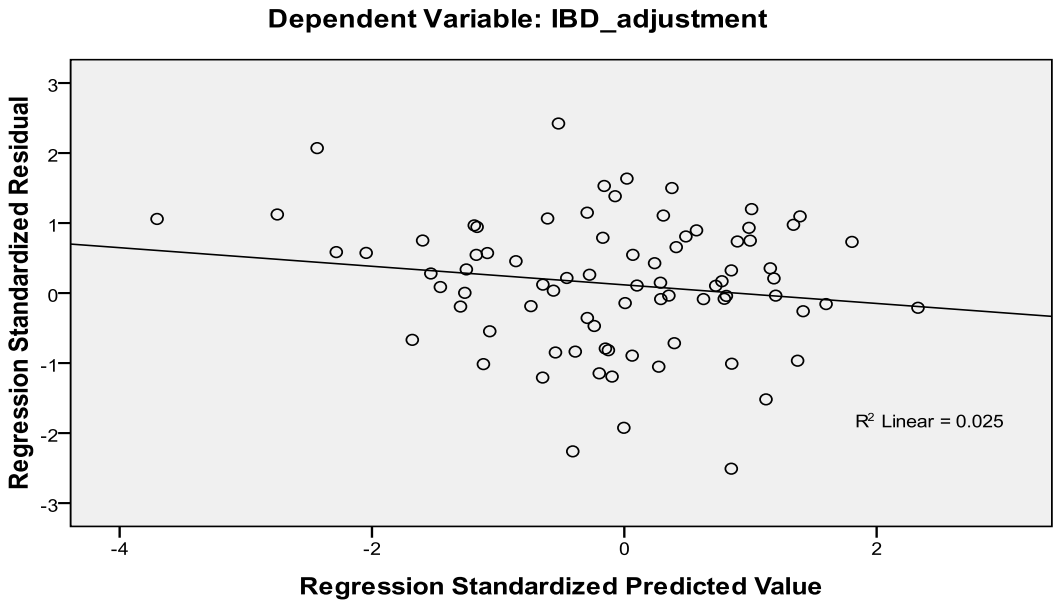

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: perceived_stress
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: perceived_stress
Regression Standardized Residual
Regression Standardized Predicted Value
R² Linear = 1.256E-4
-3
-2
-1
0
1
2
3


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: depression
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: depression
Regression Standardized Residual
Regression Standardized Predicted Value
R² Linear = 0.003
-3
-2
-1
0
1
2
3
4

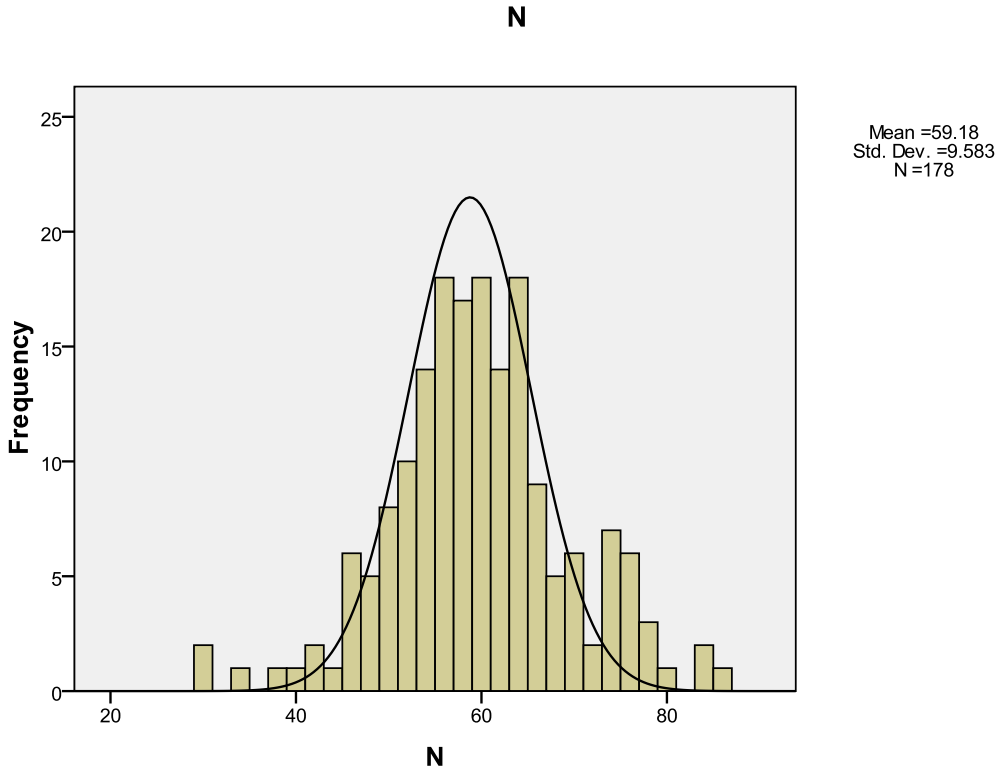

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: IBD_adjustment
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

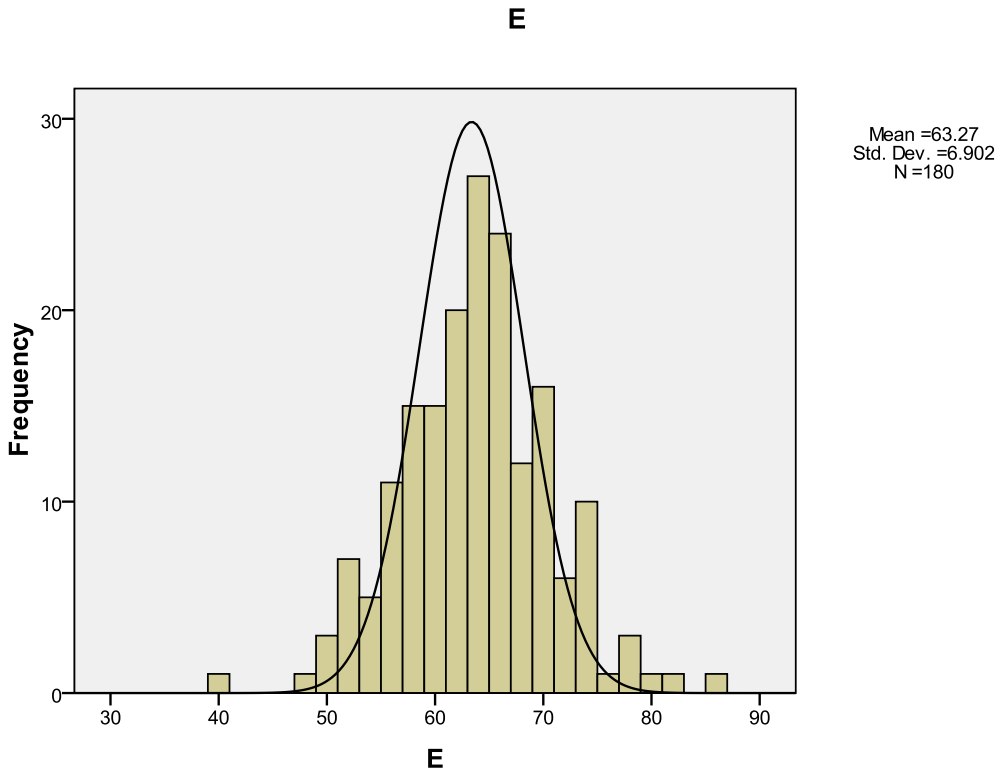

Scatterplot
Dependent Variable: IBD_adjustment
Regression Standardized Residual
Regression Standardized Predicted Value
R² Linear = 0.025
3
2
1
0
-1
-2
-3
-4
-2
0
2

Appendix E: Descriptive Statistics, Frequency Distributions, Skewness and Kurtosis of Each Study Variable

							Skewness		Kurtosis	
	N	Minimum	Maximum	*M*	*SD*	Variance	Statistic	Std. Error	Statistic	Std. Error
Neuroticism	178	30	86	59.18	9.58	91.84	0.00	0.18	0.73	0.36
Extraversion	180	40	85	63.27	6.90	47.64	0.04	0.18	0.60	0.36
Negative Affect	172	10	44	20.05	7.23	52.32	0.93	0.19	0.34	0.37
Positive Affect	172	10	48	32.90	7.29	53.11	-0.49	0.19	0.07	0.37
Optimism	181	6	30	21.31	4.33	18.72	-0.62	0.18	0.82	0.36
Self esteem	180	10	39	19.81	4.80	23.02	0.43	0.18	1.48	0.36
Internal health LOC	174	10	36	23.95	4.93	24.28	-0.36	0.18	-0.11	0.37
Chance health LOC	173	6	36	17.40	4.94	24.43	0.46	0.19	0.86	0.37
Powerful others health LOC	176	6	35	16.89	5.81	33.73	0.57	0.18	0.10	0.36
Non productive coping	181	24	99	53.64	14.65	214.67	0.27	0.18	-0.03	0.36
Active coping	181	21	90	59.97	13.86	192.20	-0.28	0.18	0.03	0.36
PCOIS	180	31	86	60.87	10.32	106.47	-0.32	0.18	-0.28	0.36
Self efficacy	179	11	30	20.61	3.44	11.86	-0.41	0.18	0.98	0.36
Emotional suppression	175	23	80	52.91	11.24	126.33	-0.26	0.18	0.31	0.37
Social support	181	18	51	38.73	6.01	36.12	-0.45	0.18	0.57	0.36
Family harmony	178	19	50	39.77	6.17	38.02	-0.55	0.18	0.45	0.36
GHQ	176	14	40	23.77	4.43	19.58	1.15	0.18	2.18	0.36
Perceived stress	179	11	45	25.75	6.15	37.85	0.44	0.18	0.18	0.36
Depression	178	21	61	29.97	7.55	56.93	1.48	0.18	3.00	0.36
IBD adjustment	92	98	196	151.36	23.62	558.06	-0.14	0.25	-0.84	0.50

Note. PCOIS=Perceived control of internal states; GHQ=General health complaints.


N
Frequency
25
20
15
10
5
0
20
40
60
80
N
Mean =59.18
Std. Dev. =9.583
N =178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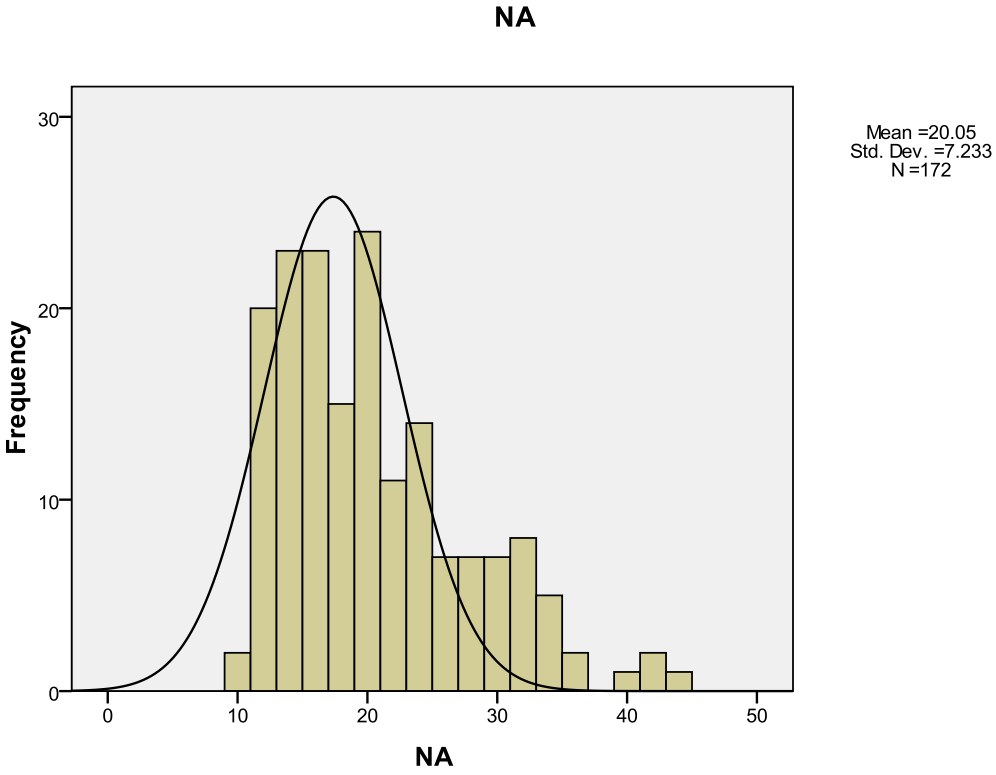
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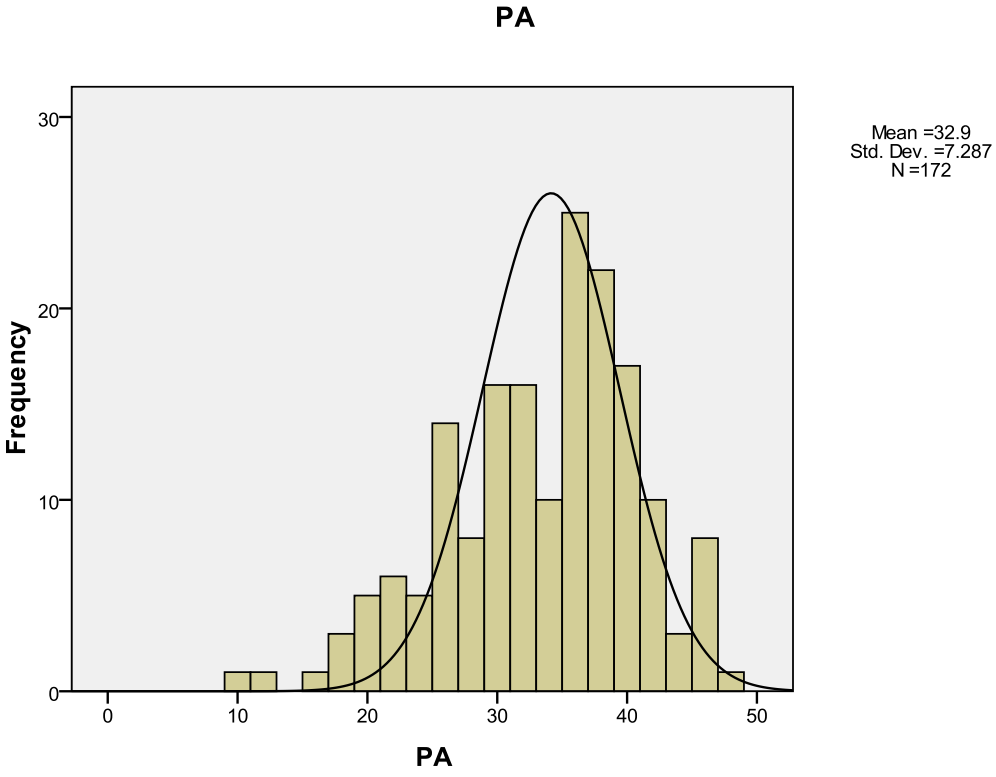
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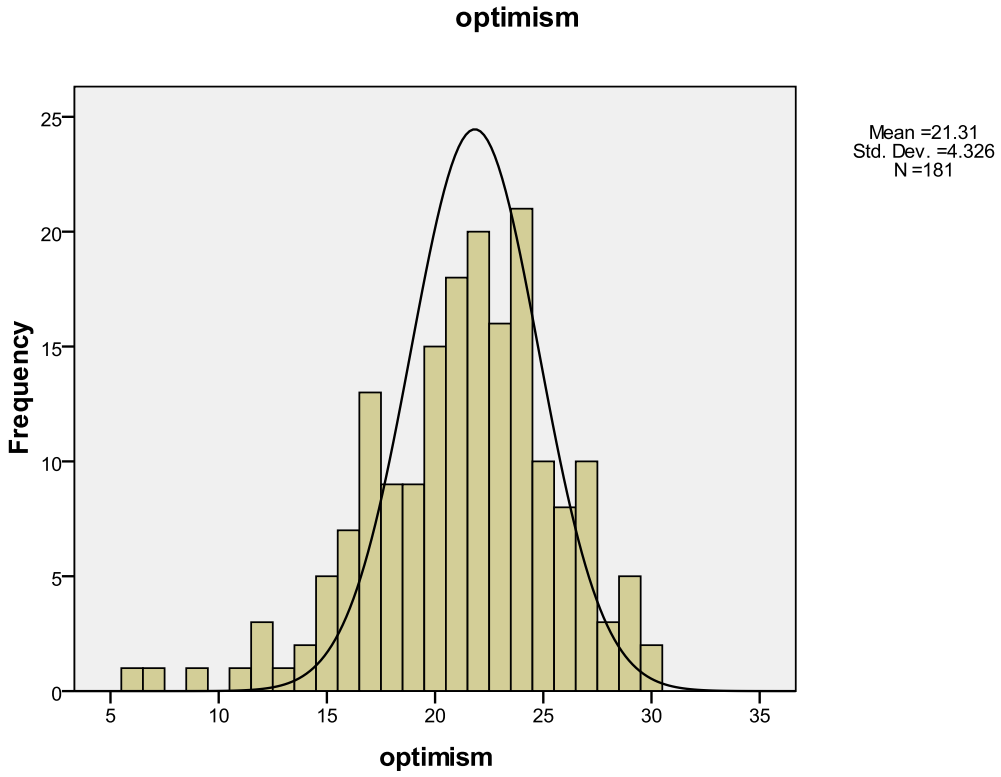
PA


optimism
Mean =21.31
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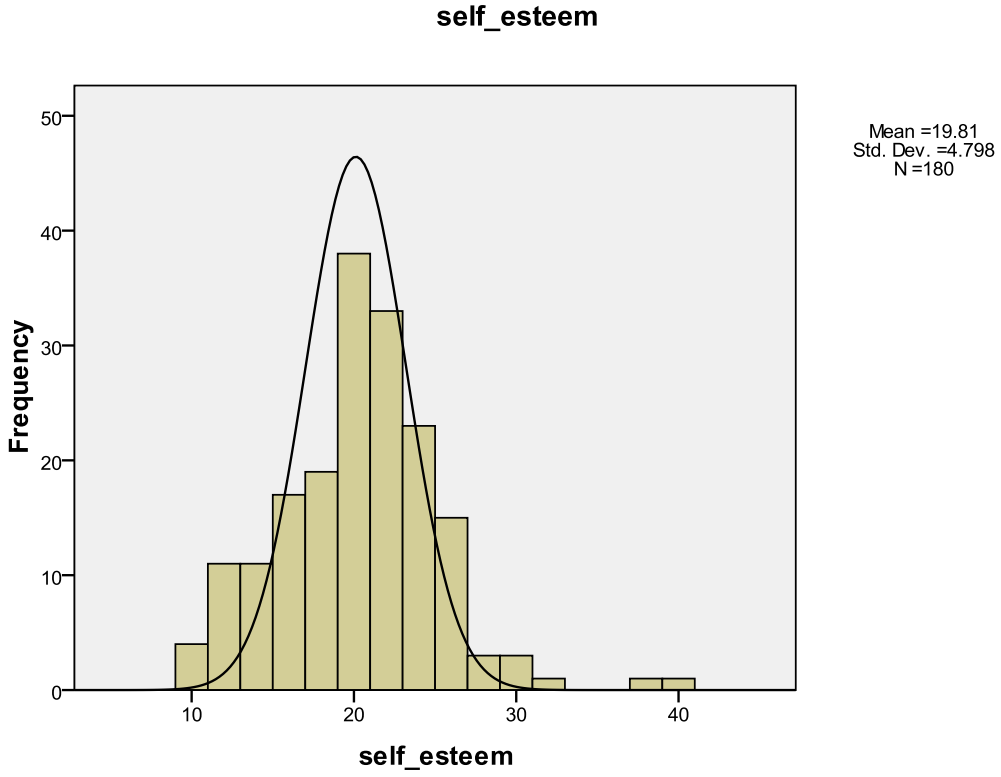
25
30
35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Mean =19.81
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Frequency
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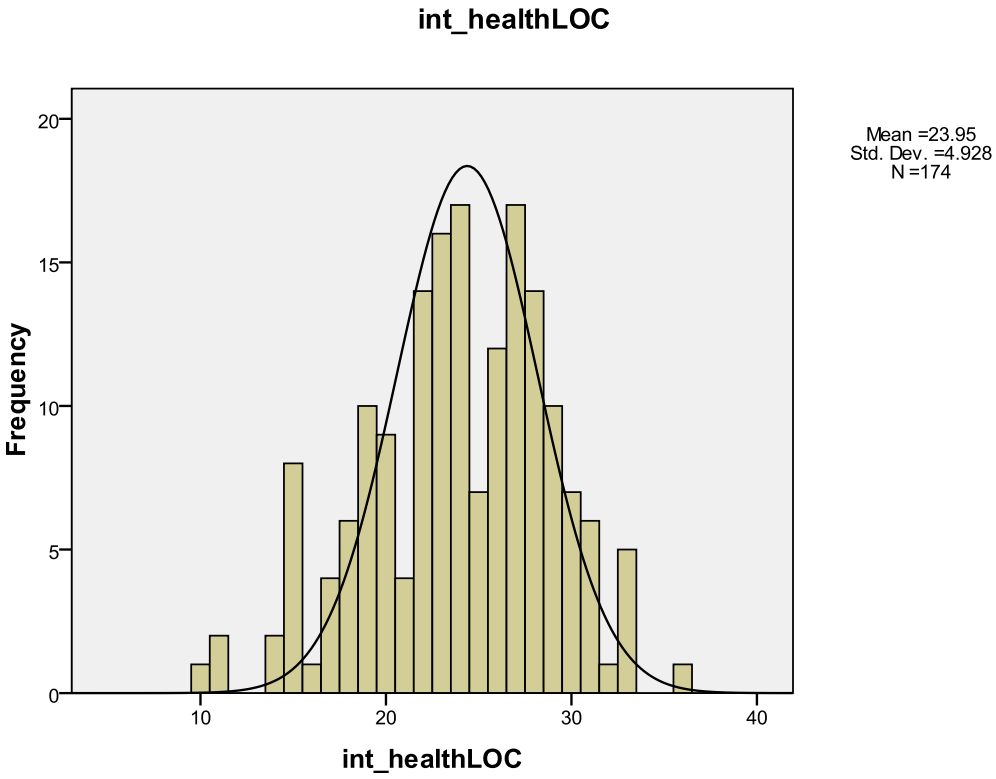
30
40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Std. Dev. =4.928
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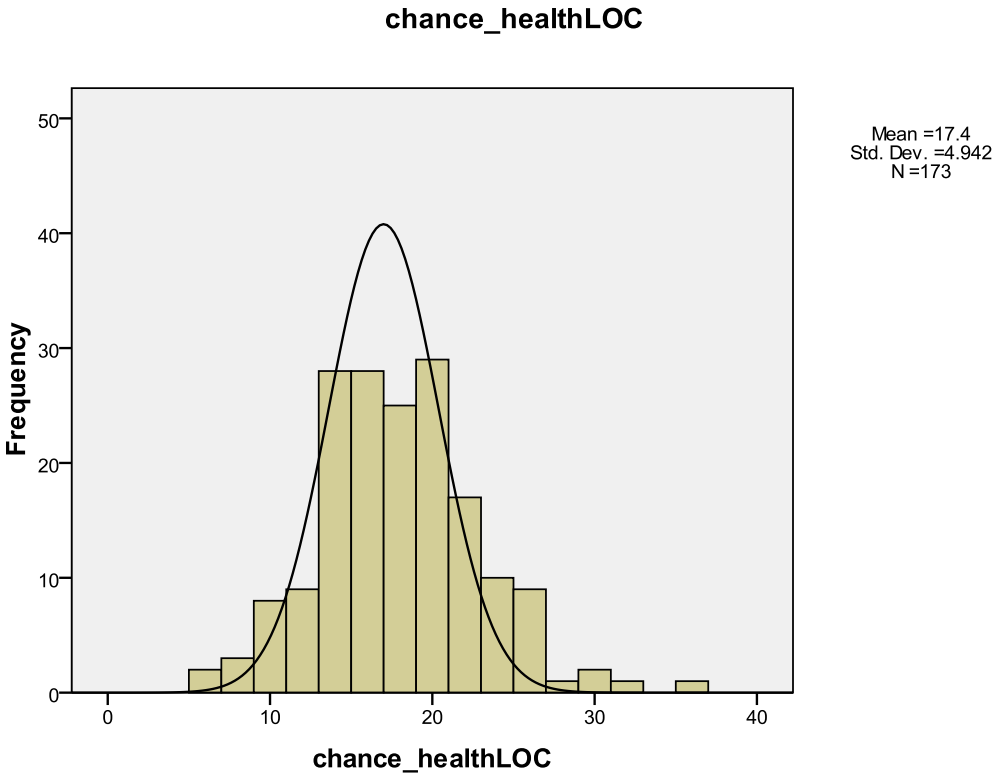
Frequency
int_healthLOC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Std. Dev. =4.942
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Frequency
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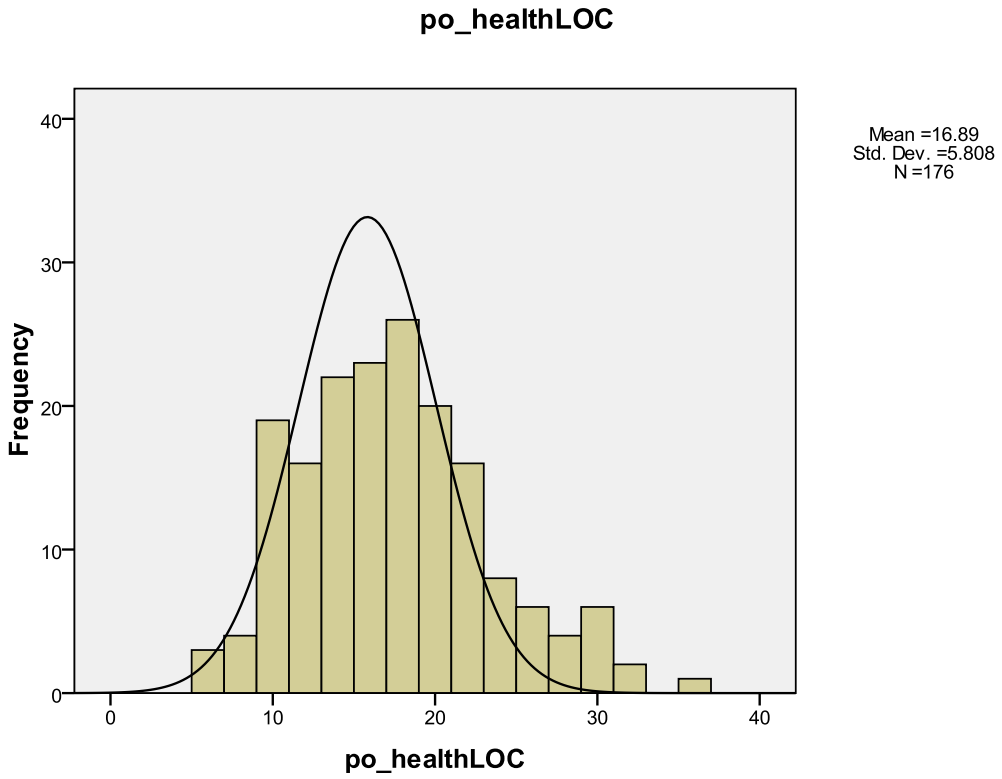
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N =176
Frequency
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30
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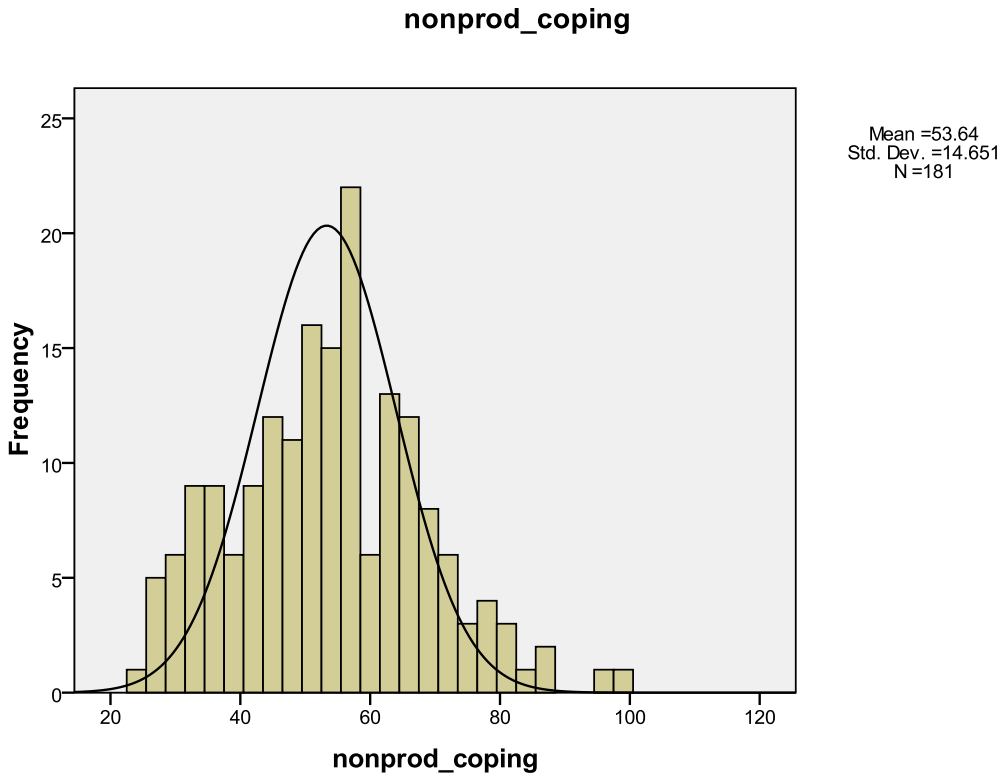
po_healthLOC


nonprod_coping
Mean =53.64
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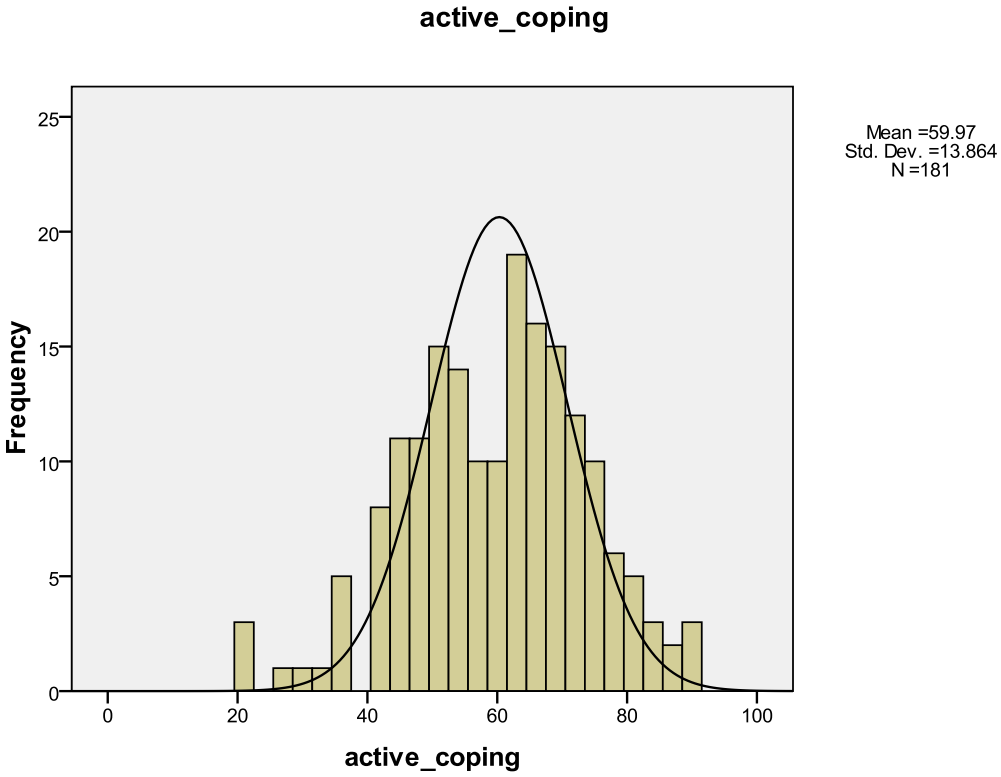
nonprod_coping


active_coping
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Frequency
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60
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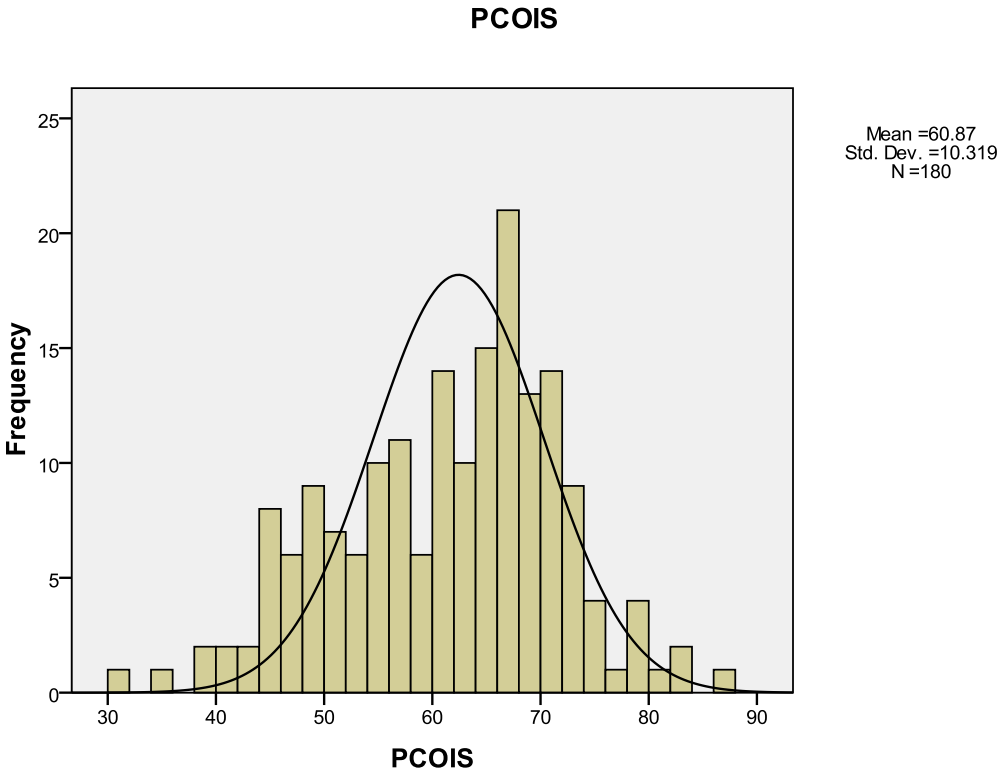
100


PCOIS
Mean =60.87
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N =180
Frequency
PCOIS
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10
15
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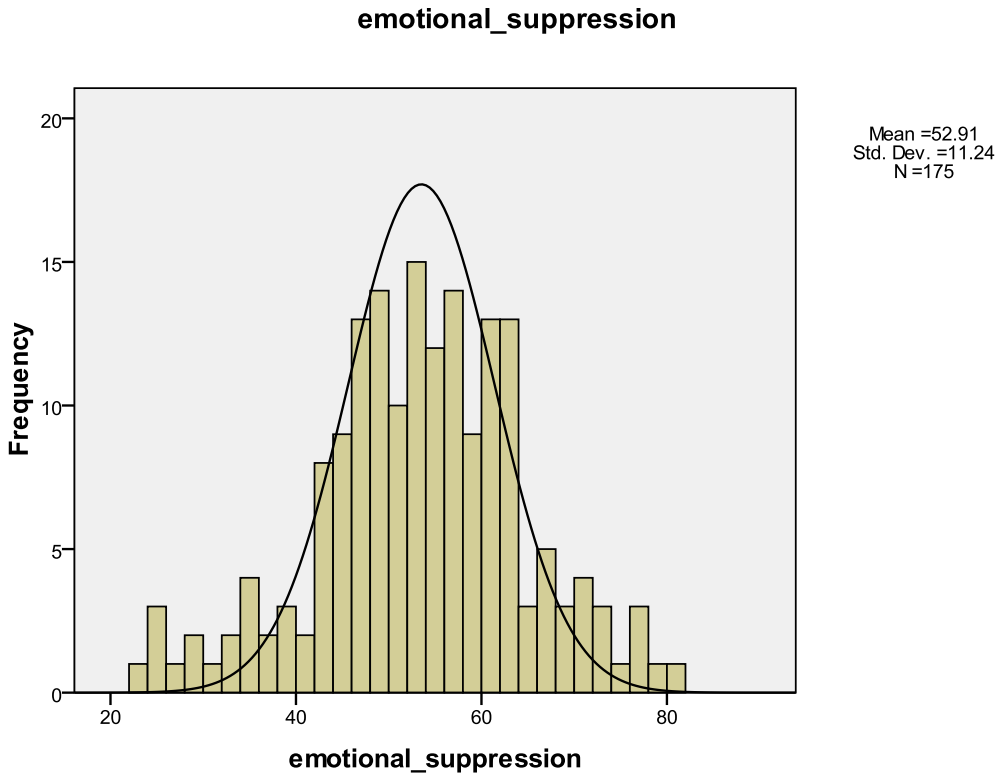
80
90


self_efficacy
Mean =20.61
Std. Dev. =3.443
N =179
Frequency
self_efficacy


emotional_suppression
Mean =52.91
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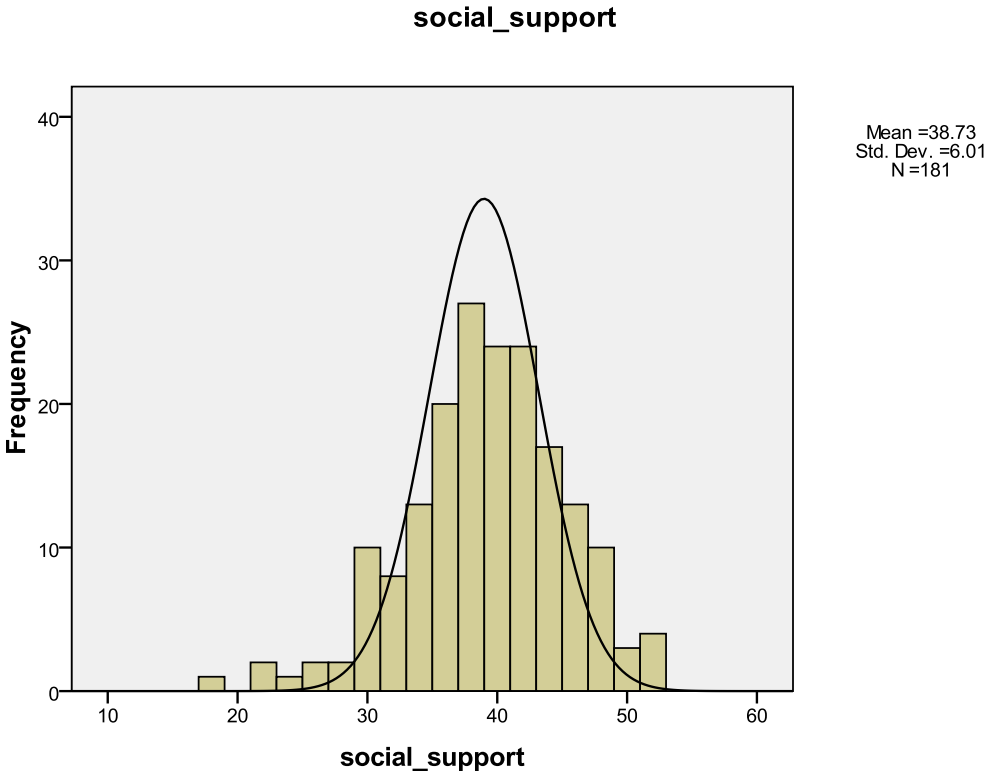
Frequency
emotional_suppression


social_support
Mean =38.73
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N =181
Frequency
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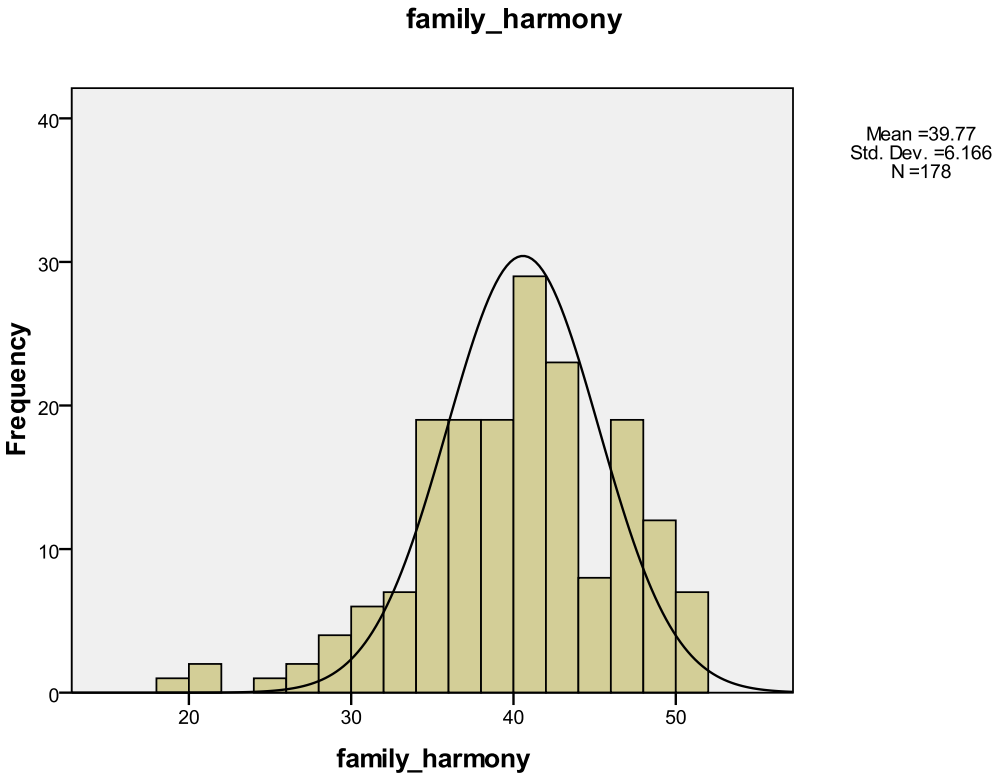
40
50
60


family_harmony
Mean =39.77
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N =178
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family_harmony
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40
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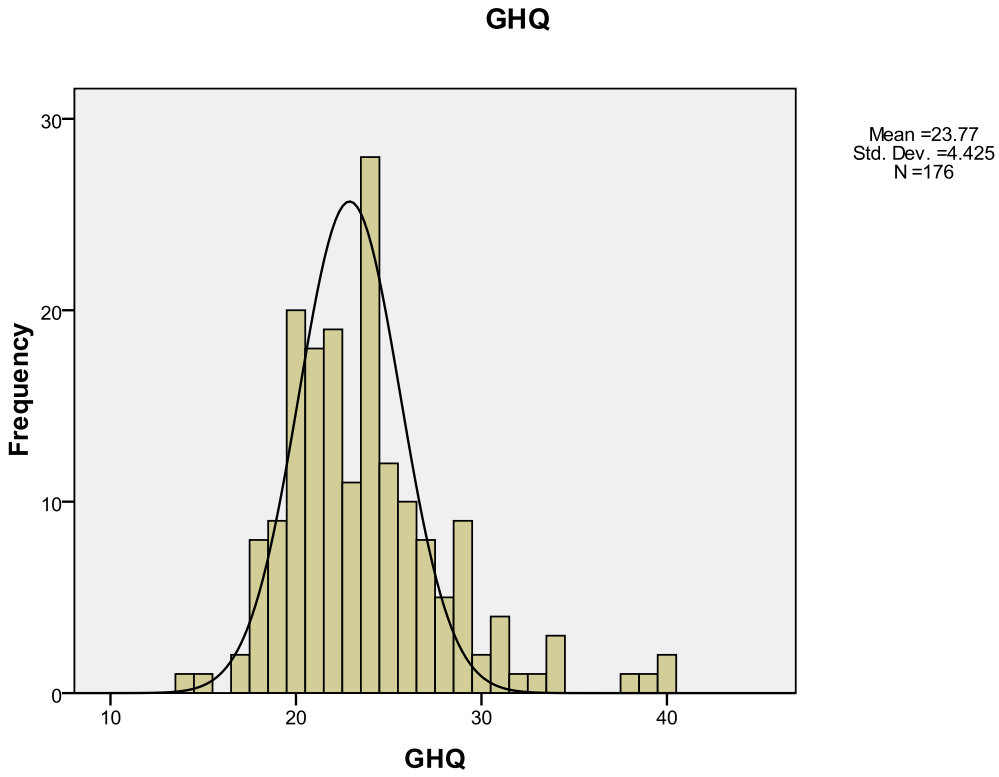
GHQ
Mean =23.77
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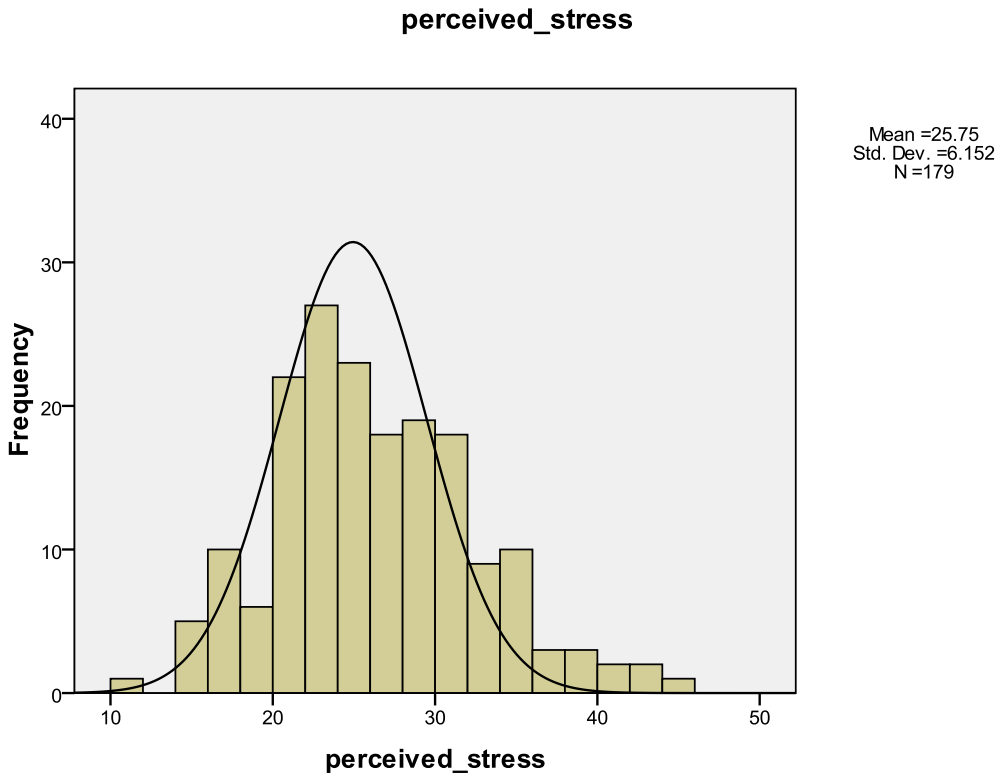
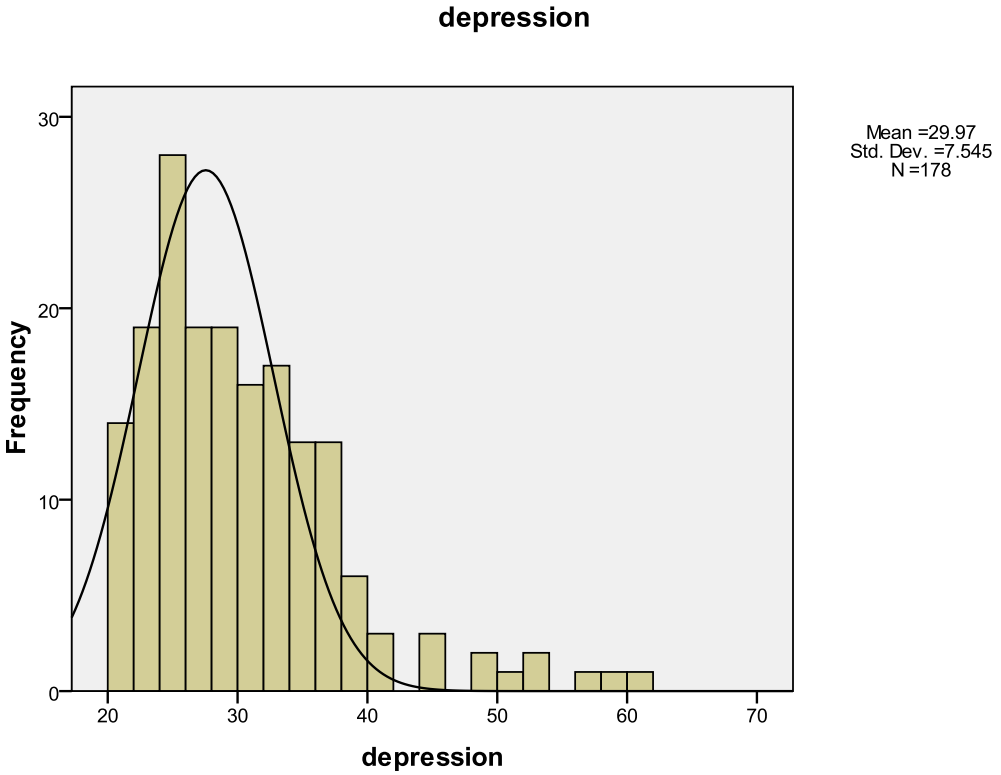
N =176
Frequency
GHQ


perceived_stress
Mean =25.75
Std. Dev. =6.152
N =179
Frequency
perceived_stress


depression
Mean =29.97
Std. Dev. =7.545
N =178
Frequency
depression
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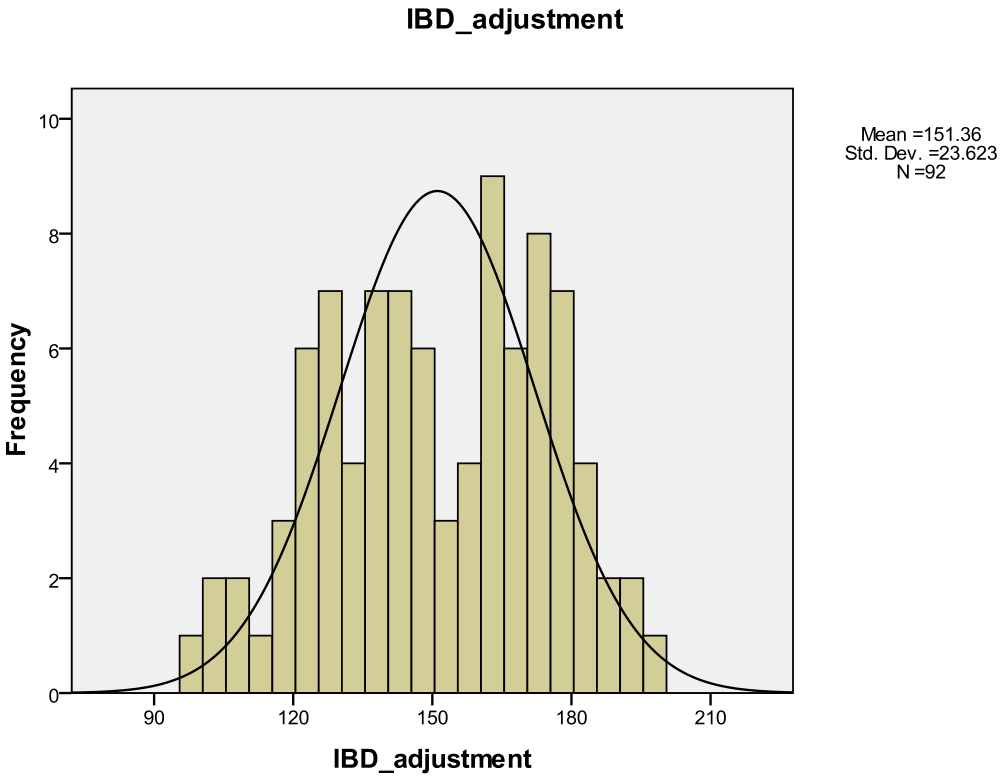
20
30
40
50
60
70


IBD_adjustment
Mean =151.36
Std. Dev. =23.623
N =92
Frequency
IBD_adjustment
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2
4
6
8
10
90
120
150
180
210

Appendix F: Descriptive Statistics and Preliminary Analyses for each Comparison Group

Appendix F contains the descriptive statistics and preliminary analyses for the non-IBD group and each IBD comparison group. Tables F.1 to F.3 contain the results of independent samples t-tests for all variables contained within this research based on whether IBD participants took medication, were admitted to hospital, or had undergone surgery as a result of their IBD. Tables F.4 to F.6 contain the results of independent samples t-tests for all study variables based on IBD condition (CD vs. UC) and severity (mild CD vs. severe CD; mild UC vs. severe UC). Appendix F also contains the results of Pearson product-moment correlations (Table F.7) and independent samples t-tests (Table F.8) to investigate age and gender differences for all personal disposition, coping-control and wellbeing measures between each comparison group.

Descriptive statistics for IBD participants based on whether they took medication, were admitted to hospital or had undergone surgery are presented in Tables F.1 to F.3. Independent samples t-tests revealed that IBD participants taking medication, compared to those not taking medication, had their IBD for a moderately significant shorter duration, and had significantly less amount of time elapsed since their last flare-up. IBD participants taking medication, compared to IBD participants not taking medication, scored significantly lower on neuroticism, non-productive coping, and external health locus of control (powerful others); each with a moderate degree of practical importance. IBD participants with admissions to hospital due to their condition, compared to those with no reported admissions, had significantly more months elapsed since their last IBD exacerbation. IBD participants who had undergone surgery as a result of their disease

scored higher on neuroticism and used more active coping strategies than those who had not undergone surgery, with a moderate level of significance. Participants with CD and UC were not found to significantly differ on any of the IBD related, disposition, coping-control or wellbeing measures utilized as part of this research (see Table F.4). When these groups were split based on severity however (see Tables F.5 and F.6), it was shown that mild UC participants, compared to severe UC participants, scored higher on the measure of active coping with moderate significance, and higher on the measure of family harmony with a high level of significance.

Table F.1 *Descriptive Statistics and t-values for Differences of the Study Variables for IBD Participants Based on Medication*

	Take Medication						
	Yes (*n*= 74)		No (*n*= 19)			Cohen's	
	M	*SD*	*M*	*SD*	*t* (df)	*d*	*p*
IBD related variables							
Age at first flare-up	29.91	11.54	24.68	11.76	1.75(91)	0.45	.08
IBD duration	9.38	7.95	16.58	11.76	-2.52(22)	0.72	.02
Months since last flare	11.45	18.18	41.75	39.31	-3.01(17)	0.99	.01
Length of Hospital stay (in days)	14.51	21.04	24.00	20.73	-1.49(59)	0.45	.14
Personal disposition							
Negative Affect	21.19	8.46	22.11	6.37	-0.44(85)	0.03	.66
Positive Affect	31.68	8.25	33.47	6.34	-1.02(37)	0.24	.32
Neuroticism	58.78	9.69	65.42	9.48	-2.67(89)	0.69	.01
Extraversion	63.39	6.93	63.89	7.50	-0.28(89)	0.07	.78
Optimism	21.32	5.28	20.47	3.03	0.91(50)	0.20	.37
Self esteem	30.22	5.25	28.78	4.04	1.09(89)	0.31	.28
Coping - Control							
Internal LOC	22.33	4.78	22.47	5.61	-0.11(86)	0.03	.91
Chance LOC	18.31	5.64	18.16	3.99	0.11(85)	0.03	.91
Powerful others LOC	20.23	5.60	16.63	6.79	2.37(88)	0.58	.02
Non-productive coping	53.92	14.97	62.68	13.71	-2.31(90)	0.61	.02
Active coping	58.89	13.96	59.05	16.03	-0.04(90)	0.01	.97
PCOIS	60.86	10.83	56.84	10.13	1.46(89)	0.38	.15
Emotional suppression	53.09	11.80	55.68	11.52	-0.85(86)	0.22	.40
Self efficacy	29.19	3.64	28.72	4.35	0.47(88)	0.12	.64
Social support	38.75	6.61	37.21	3.68	1.35(52)	0.29	.18
Family Harmony	39.92	6.45	37.32	6.03	1.59(89)	0.42	.12
Wellbeing							
GHQ	24.54	5.44	24.67	3.20	-0.13(45)	0.03	.90
Perceived stress	26.38	6.02	29.11	6.82	-1.71(90)	0.42	.09
Depression	31.50	7.10	32.79	8.99	-0.67(89)	0.16	.51
IBD Adjustment	151.04	23.96	152.58	22.86	-0.25(90)	0.07	.80

Table F.2 *Descriptive Statistics and t-values for Differences of the Study Variables for IBD Participants Based on Hospital Admission*

	Hospital Admission						
	Yes (n= 67)		No (n= 24)			Cohen's	
	M	*SD*	*M*	*SD*	*t* (df)	*d*	*p*
IBD related variables							
Age at first flare-up	28.18	12.33	31.50	9.41	-1.20(89)	0.30	.23
IBD duration	11.28	8.88	7.42	6.43	1.95(89)	0.50	.05
Months since last flare	19.73	28.64	9.77	15.61	2.03(68)	0.43	.05
Length of Hospital stay (in days)	16.69	21.18	n/a	n/a	n/a	n/a	n/a
Personal disposition							
Negative Affect	21.64	8.06	20.75	8.18	0.46(83)	0.11	.65
Positive Affect	32.67	8.10	31.21	6.98	0.78(83)	0.16	.44
Neuroticism	60.69	9.40	57.50	10.26	1.39(87)	0.32	.17
Extraversion	63.78	6.81	62.25	6.96	0.94(87)	0.22	.35
Optimism	21.17	4.69	21.04	5.73	0.11(88)	0.02	.92
Self esteem	30.15	4.67	29.75	5.78	0.34(88)	0.08	.74
Coping - Control							
Internal LOC	22.26	5.17	23.13	3.86	-0.74(84)	0.19	.46
Chance LOC	18.36	5.47	18.21	5.15	0.12(83)	0.03	.91
Powerful others LOC	19.27	6.37	20.46	4.85	-0.83(86)	0.21	.41
Non-productive coping	56.55	14.01	51.25	15.35	1.55(88)	0.36	.13
Active coping	60.09	13.54	56.00	13.26	1.27(88)	0.31	.21
PCOIS	59.34	10.79	62.33	10.57	-1.17(87)	0.28	.25
Emotional suppression	54.38	10.54	51.17	13.90	1.14(84)	0.26	.26
Self efficacy	29.48	3.79	28.33	3.52	1.29(87)	0.31	.20
Social support	39.06	5.34	36.83	8.02	1.26(31)	0.33	.22
Family Harmony	39.17	6.48	39.71	6.49	-0.35(87)	0.08	.73
Wellbeing							
GHQ	24.50	4.88	24.52	5.77	-0.02(85)	0.00	.99
Perceived stress	27.35	6.47	25.79	5.63	1.04(88)	0.26	.30
Depression	32.03	7.00	29.63	6.77	1.45(87)	0.35	.15
IBD Adjustment	151.55	23.09	152.17	24.34	-0.11(88)	0.03	.91

Table F.3 *Descriptive Statistics and t-values for Differences of the Study Variables for IBD Participants Based on Surgical Treatment*

	Surgical Treatment						
	Yes (*n*= 34)		No (*n*= 59)			Cohen's	
	M	*SD*	*M*	*SD*	*t* (df)	*d*	*p*
IBD related variables							
Age at first flare-up	27.26	11.76	29.75	11.69	-0.98(91)	0.21	.33
IBD duration	12.53	8.66	9.88	9.52	1.33(91)	0.29	.19
Months since last flare	20.19	28.76	15.41	24.69	0.81(83)	0.18	.42
Length of Hospital stay (in days)	20.11	25.60	13.79	16.40	1.17(59)	0.29	.25
Personal disposition							
Negative Affect	21.94	7.80	21.07	8.20	0.48(85)	0.11	.63
Positive Affect	32.56	7.98	31.78	7.87	0.44(85)	0.10	.66
Neuroticism	63.79	9.69	58.10	9.61	2.71(89)	0.59	.01
Extraversion	63.85	6.88	63.29	7.14	0.36(89)	0.08	.72
Optimism	21.03	3.92	21.20	5.40	-0.16(90)	0.04	.87
Self esteem	29.24	4.94	30.33	5.10	-0.99(89)	0.22	.33
Coping - Control							
Internal LOC	21.91	5.23	22.63	4.78	-0.66(86)	0.14	.51
Chance LOC	17.68	5.05	18.61	5.45	-0.78(85)	0.18	.42
Powerful others LOC	18.28	6.36	20.12	5.76	-1.40(88)	0.30	.17
Non-productive coping	59.18	13.94	53.80	15.46	1.66(90)	0.37	.10
Active coping	64.55	12.58	55.78	14.37	2.93(90)	0.65	<.01
PCOIS	59.79	9.93	60.16	11.29	-0.16(89)	0.03	.88
Emotional suppression	55.76	9.23	52.38	12.90	1.31(86)	0.30	.19
Self efficacy	29.30	3.80	28.98	3.78	0.39(88)	0.08	.70
Social support	38.73	5.90	38.27	6.31	0.34(90)	0.08	.74
Family Harmony	38.76	6.91	39.72	6.15	-0.69(89)	0.15	.49
Wellbeing							
GHQ	24.15	4.78	24.80	5.23	-0.59(87)	0.13	.56
Perceived stress	27.15	6.07	26.83	6.40	0.24(90)	0.05	.82
Depression	33.21	9.06	30.95	6.39	1.39(89)	0.29	.17
IBD Adjustment	145.15	24.10	154.83	22.83	-1.91(90)	0.41	.06

Table F.4 *Descriptive Statistics and t-values for Differences of the Study Variables for CD and UC Participants*

	CD (n= 53)		UC (n= 40)			Cohen's	
	M	*SD*	*M*	*SD*	*t* (df)	*d*	*p*
IBD related variables							
Age at diagnosis	28.06	11.37	29.88	12.22	-0.74(91)	0.15	.46
IBD duration	10.13	8.52	11.80	10.19	-0.86(91)	0.18	.39
Months since last flare	16.39	26.72	18.19	25.76	-0.31(83)	0.07	.76
Length of Hospital stay (in days)	17.68	23.78	14.81	15.42	0.50(59)	0.14	.62
Personal disposition							
Negative Affect	20.73	7.89	22.33	8.23	-0.92(85)	0.20	.36
Positive Affect	31.27	8.61	33.19	6.64	-1.17(85)	0.25	.27
Neuroticism	61.11	9.25	58.84	10.88	1.07(89)	0.22	.29
Extraversion	62.83	7.14	64.42	6.82	-1.07(89)	0.23	.29
Optimism	20.30	4.93	22.28	4.68	-1.94(90)	0.41	.06
Self esteem	30.12	4.98	29.69	5.18	0.39(89)	0.08	.69
Coping – Control							
Internal LOC	22.33	4.94	22.41	5.00	-0.07(86)	0.02	.95
Chance LOC	18.66	5.93	17.76	4.34	0.78(85)	0.17	.44
Powerful others LOC	19.60	5.91	19.29	6.22	0.24(88)	0.05	.81
Non-productive coping	57.00	14.76	54.00	15.53	0.94(90)	0.20	.35
Active coping	59.77	13.73	57.77	15.18	0.66(90)	0.14	.51
PCOIS	59.91	11.19	60.18	10.27	-0.12(89)	0.03	.90
Emotional Suppression	55.51	9.98	51.08	13.49	1.77(86)	0.37	.08
Self efficacy	29.40	3.86	28.68	3.65	0.89(88)	0.19	.37
Social Support	38.17	5.89	38.79	6.53	-0.48(90)	0.10	.63
Family Harmony	39.11	5.96	39.74	7.07	-0.46(89)	0.10	.65
Wellbeing							
GHQ	24.60	5.38	24.51	4.62	0.08(87)	0.02	.94
Perceived Stress	26.58	6.16	27.44	6.42	-0.64(90)	0.14	.52
Depression	32.51	7.50	30.74	7.47	1.11(89)	0.24	.27
IBD Adjustment	149.81	23.68	153.46	23.68	-0.73(90)	0.15	.47

Table F.5 *Descriptive Statistics and t-values for Differences of the Study Variables for Mild CD vs. Severe CD*

	Mild CD (*n*=14)		Severe CD (*n*=38)			Cohen's	
	M	*SD*	*M*	*SD*	*t* (df)	*d*	*p*
IBD related variables							
Age at diagnosis	30.29	13.71	27.05	10.55	0.90(50)	0.26	.37
IBD duration	4.79	3.40	12.16	9.10	-2.94(50)	1.07	<.01
Months since last flare	20.00	28.17	15.49	26.75	0.51(46)	0.16	.61
Length of Hospital stay (in days)	17.11	19.45	18.13	25.55	-0.11(37)	0.04	.91
Personal disposition							
Negative Affect	20.64	6.68	20.97	8.40	-0.13(48)	0.04	.90
Positive Affect	30.64	7.89	31.94	8.69	-0.49(48)	0.15	.63
Neuroticism	57.07	8.10	62.61	9.43	-1.95(50)	0.63	.06
Extraversion	63.21	8.21	62.97	6.68	0.11(50)	0.03	.91
Optimism	21.36	4.94	20.00	4.98	0.87(50)	0.27	.39
Self-esteem	30.43	5.39	30.11	4.92	0.20(49)	0.06	.84
Coping - Control							
Internal LOC	23.31	5.07	22.08	4.96	0.76(48)	0.25	.45
Chance LOC	19.77	6.11	18.17	5.95	0.83(47)	0.27	.41
Powerful others LOC	20.71	4.81	19.24	6.35	0.78(49)	0.26	.44
Non productive coping	50.79	15.50	59.29	14.20	-1.87(50)	0.57	.07
Active coping	56.14	9.81	61.34	14.89	-1.21(50)	0.41	.23
PCOIS	61.57	11.35	59.34	11.37	0.63(50)	0.20	.53
Emotional suppression	55.46	9.06	55.35	10.48	0.03(48)	0.01	.97
Self-efficacy	29.21	3.81	29.46	3.98	-0.20(49)	0.06	.84
Social Support	39.57	6.11	37.97	5.55	0.90(50)	0.27	.37
Family Harmony	40.00	6.33	38.97	5.85	0.55(50)	0.17	.59
Wellbeing							
GHQ	25.00	4.51	24.43	5.80	0.33(49)	0.11	.74
Perceived Stress	26.79	5.73	26.68	6.38	0.05(50)	0.02	.96
Depression	31.21	6.68	32.92	7.90	-0.72(50)	0.23	.48
IBD Adjustment	152.71	23.66	149.45	23.85	0.44(50)	0.14	.66

Table F.6 *Descriptive Statistics and t-values for Differences of the Study Variables for Mild UC vs. Severe UC*

	Mild UC (*n*=15)		Severe UC (*n*=23)			Cohen's	
	M	*SD*	*M*	*SD*	*t* (df)	*d*	*p*
IBD related variables							
Age at diagnosis	31.40	12.51	29.52	12.02	0.46(36)	0.15	.65
IBD duration	3.87	3.25	15.83	9.61	-4.63(29)	1.67	.00
Months since last flare	16.57	26.34	18.71	26.40	-0.24(33)	0.08	.82
Length of Hospital stay (in days)	21.86	24.61	10.54	6.44	1.20(6)	0.63	.27
Personal disposition							
Negative Affect	20.33	8.48	23.55	8.08	-1.14(33)	0.39	.26
Positive Affect	35.40	5.60	31.65	7.18	1.68(33)	0.58	.10
Neuroticism	56.87	6.96	59.43	11.84	-0.81(33)	0.26	.42
Extraversion	64.93	6.95	63.57	6.13	0.62(34)	0.21	.54
Optimism	22.60	3.98	22.05	5.39	0.34(35)	0.12	.74
Self-esteem	30.40	3.16	29.68	6.08	0.42(35)	0.15	.68
Coping - Control							
Internal LOC	23.53	4.16	22.14	5.03	0.88(34)	0.30	.39
Chance LOC	17.80	4.74	17.81	4.24	-0.01(34)	0.00	.99
Powerful others LOC	20.27	5.75	19.05	6.43	0.59(35)	0.20	.56
Non productive coping	50.00	12.91	54.00	14.37	-0.87(35)	0.29	.40
Active coping	62.60	14.60	52.77	13.47	2.11(35)	0.70	.04
PCOIS	63.20	7.62	58.38	11.39	1.52(34)	0.50	.14
Emotional suppression	49.57	17.06	52.67	11.38	-0.60(21)	0.21	.56
Self-efficacy	28.50	3.84	29.05	3.55	-0.44(34)	0.15	.67
Social Support	39.53	6.03	38.00	6.88	0.70(35)	0.24	.49
Family Harmony	42.87	5.24	37.24	7.58	2.48(34)	0.86	.02
Wellbeing							
GHQ	23.13	5.30	25.50	4.03	-1.50(33)	0.50	.14
Perceived Stress	26.13	4.52	28.55	7.20	-1.15(35)	0.40	.26
Depression	27.73	5.27	31.67	6.24	-1.99(34)	0.68	.06
IBD Adjustment	153.33	24.17	155.36	22.38	-0.26(35)	0.09	.80

Table F.7 presents the Pearson's correlation coefficients of age with the measures of personal dispositions, coping-control and wellbeing. With an increase in age, non-IBD participants displayed significantly less neuroticism and non-productive coping, and significantly greater perceived control of internal states and self-esteem. A belief that powerful others, such as doctors, are in control of one's health was the only significant factor associated with an increase in age for IBD participants. Negative relationships were identified for NA and perceived stress with age for CD participants. While for UC participants, age was negatively associated with extraversion, active coping and internal control, and positively associated with powerful others LOC. Participants with mild CD did not reveal any significant associations between age and personality, coping-control or wellbeing factors. Participants with severe CD however displayed significantly less NA, less non-productive coping, greater perceived control and less stress with an increase in age. Mild UC participants showed significantly less internal LOC with age; while severe UC participants displayed significantly less extraversion and greater powerful others LOC with age.

Table F.7 *Correlation Coefficients of Age with Personal Disposition, Coping – Control, and Wellbeing Measures Based on Illness, IBD Condition and Severity*

	AGE							
	non-IBD (*n*=87)	IBD (*n*=95)	CD (*n*=53)	UC (*n*=40)	Mild CD (*n*=14)	Severe CD (*n*=38)	Mild UC (*n*=15)	Severe UC (*n*=23)
Personal disposition								
NA	-.17	-.10	-.30*	.15	-.12	-.36*	.05	.14
PA	.02	-.06	.04	-.25	.11	.02	-.11	-.24
Neuroticism	-.38***	-.13	-.09	-.15	.23	-.25	-.25	-.21
Extraversion	.08	-.14	-.00	-.37*	.07	-.01	-.26	-.50*
Optimism	.13	-.10	-.05	-.23	-.23	.05	-.42	-.15
Self-esteem	.23*	.09	.18	-.00	-.06	.31	-.04	.06
Coping-control								
Internal LOC	-.11	-.20	.01	-.42**	-.08	.07	-.53*	-.36
Chance LOC	.12	-.10	-.07	-.13	-.23	.01	-.30	-.02
Powerful others LOC	-.03	.27**	.22	.33*	.37	.22	.29	.46*
Non-productive-coping	-.36***	-.16	-.23	-.035	-.08	-.34*	.03	-.21
Active-coping	-.11	-.17	.07	-.41***	.46	-.04	-.39	-.41
PCOIS	.30***	.09	.24	-.11	.09	.32*	.18	-.13
Emotional Suppression	.01	.01	.24	-.14	.17	.26	-.08	-.27
Self-efficacy	.04	-.04	.11	-.18	-.23	.23	-.06	-.30
Social support	.11	-.00	.05	-.09	.01	.12	.20	-.21
Family Harmony	-.05	-.01	.06	-.10	-.05	.14	-.31	.15
Wellbeing								
GHQ	-.08	-.05	-.17	.12	.22	-.28	-.14	.20
Perceived Stress	-.17	-.12	-.34*	.10	-.06	-.44**	-.13	.14
Depression	-.16	-.06	-.08	-.02	.09	-.16	-.35	-.08
IBD adjustment	n/a	.12	.13	.09	-.14	.25	.06	.12

*p<.05; **p<.01; ***p<.001

Table F.8 *Descriptive Statistics and t-values for Gender Differences Based on Illness*

		IBD (*n*=95)			non-IBD (*n*=87)		
		M	*SD*	*t*	*M*	*SD*	*t*
Personal disposition							
NA	Male	21.00	7.71	-0.39	18.65	6.11	-0.05
	Female	21.68	8.31		18.71	6.11	
PA	male	32.65	8.27	0.59	34.35	6.13	0.74
	female	31.64	7.62		33.29	6.93	
Neuroticism	Male	59.30	9.45	-0.69	58.08	8.57	-0.07
	Female	60.76	10.36		58.21	9.61	
Extraversion	Male	61.92	6.98	-1.68	62.26	6.60	-1.16
	female	64.37	6.92		63.96	6.97	
Optimism	male	20.50	5.18	-1.02	21.49	3.29	-0.15
	female	21.54	4.62		21.60	3.98	
Self esteem	male	30.15	4.31	0.48	31.41	4.04	1.60
	female	29.64	5.52		29.85	4.87	
Coping - control							
Internal LOC	male	22.92	4.06	0.87	25.68	4.03	0.21
	female	21.98	5.47		25.48	4.69	
Chance LOC	male	19.39	5.89	1.66	17.16	4.00	1.21
	female	17.49	4.74		16.00	4.69	
Powerful others LOC	male	20.11	5.64	0.84	14.37	4.06	0.34
	female	19.02	6.27		14.06	4.26	
Non productive cope	male	54.83	14.95	-0.81	51.85	11.43	0.72
	female	57.44	16.06		49.81	14.31	
Active cope	male	57.75	12.01	-0.61	60.85	13.02	-0.25
	female	59.56	15.71		61.56	13.91	
PCOIS	male	60.26	9.88	0.26	61.90	9.04	0.01
	female	59.67	11.35		61.88	10.56	
Emotional suppression	male	55.94	11.64	1.54	55.08	8.51	2.41*
	female	52.06	11.62		49.81	11.84	
Self efficacy	male	29.38	3.73	0.66	29.72	2.74	0.02
	female	28.85	3.88		29.71	3.23	
Social support	male	36.73	5.84	-2.20*	37.59	4.99	-2.36*
	female	39.48	6.13		40.50	6.26	
Family Harmony	male	38.66	5.70	-0.90	39.26	5.51	-1.33
	female	39.89	6.89		40.94	6.16	
Wellbeing							
GHQ	male	24.03	3.89	-0.88	23.08	3.00	0.26
	female	24.92	5.72		22.88	3.93	
Perceived stress	male	26.32	6.27	-0.81	23.72	5.34	-1.11
	female	27.39	6.26		25.10	6.16	
Depression	male	30.84	6.93	-0.98	27.56	5.27	-0.62
	female	32.41	7.87		28.52	8.43	
IBD Adjustment	male	153.37	23.84	0.68	n/a	n/a	n/a
	female	149.94	23.59		n/a	n/a	

*p<.05

Table F.9 *Descriptive Statistics and t-values for Gender Differences Based on IBD Condition*

		CD (*n*=53)			UC (*n*=40)		
		M	*SD*	*t*	*M*	*SD*	*t*
Personal disposition							
NA	male	20.71	7.24	-0.01	21.25	8.27	-0.88
	female	20.74	8.30		23.69	8.24	
PA	male	30.18	9.63	-0.64	34.75	6.44	1.61
	female	31.82	8.15		31.25	6.57	
Neuroticism	male	60.76	8.29	-0.19	58.05	10.38	-0.47
	female	61.28	9.79		59.72	11.65	
Extraversion	male	58.94	7.89	-2.65*	65.00	4.86	0.53
	female	64.67	6.03		63.78	8.60	
Optimism	male	18.82	5.16	-1.52	22.00	5.06	-0.40
	female	21.00	4.73		22.61	4.33	
Self esteem	male	29.18	4.42	-0.95	31.29	4.14	2.18*
	female	30.57	5.24		27.83	5.74	
Coping – control							
Internal LOC	male	23.19	4.54	0.83	22.70	3.74	0.37
	female	21.94	5.13		22.06	6.27	
Chance LOC	male	20.81	7.16	1.80	18.25	4.52	0.75
	female	17.65	5.06		17.18	4.17	
Powerful others LOC	male	19.38	4.98	-0.18	20.67	6.15	1.55
	female	19.69	6.35		17.59	6.05	
Non productive cope	male	54.71	13.44	-0.78	52.14	13.57	-0.80
	female	58.08	15.40		56.17	17.70	
Active cope	male	57.53	13.38	-0.82	58.43	11.53	0.29
	female	60.83	13.95		57.00	18.92	
PCOIS	male	58.76	9.67	-0.51	62.05	10.21	1.19
	female	60.44	11.93		58.11	10.22	
Emotional suppression	male	58.18	10.45	1.36	53.95	12.55	1.34
	female	54.18	9.62		48.06	14.13	
Self efficacy	male	29.35	4.12	-0.07	29.52	3.30	1.61
	female	29.43	3.79		27.65	3.89	
Social support	male	34.65	4.97	-3.26*	38.81	6.06	0.02
	female	39.83	5.59		38.78	7.21	
Family Harmony	male	36.76	5.55	-2.03*	40.19	5.47	0.44
	female	40.22	5.90		39.18	8.81	
Wellbeing							
GHQ	male	24.41	3.84	-0.17	23.68	4.00	-1.13
	female	24.69	6.04		25.39	5.17	
Perceived stress	male	25.53	5.16	-0.86	26.95	7.10	-0.50
	female	27.08	6.59		28.00	5.68	
Depression	male	32.76	8.42	0.17	29.20	5.02	-1.35
	female	32.39	7.15		32.44	9.36	
IBD Adjustment	male	150.12	26.61	0.06	156.00	21.65	0.72
	female	149.67	22.58		150.50	26.17	

*p<.05

Table F.10 *Descriptive Statistics and t-values for Gender Differences Based on CD Severity*

		Mild CD (*n*=14)			Severe CD (*n*=38)		
		M	*SD*	*t*	*M*	*SD*	*t*
Personal disposition							
NA	male	21.17	5.60	0.25	21.20	8.28	0.10
	female	20.25	7.74		20.88	8.60	
PA	male	27.83	5.64	-1.17	33.00	10.59	0.48
	female	32.75	9.00		31.54	8.04	
Neuroticism	male	61.00	4.15	1.68	60.60	10.61	-0.78
	female	54.12	9.30		63.32	9.07	
Extraversion	male	58.00	5.55	-2.41*	60.20	9.27	-1.21
	female	67.12	7.90		63.96	5.36	
Optimism	male	18.67	4.80	-1.95	19.10	5.84	-0.66
	female	23.38	4.24		20.32	4.71	
Self esteem	male	26.33	2.50	-3.46**	31.20	4.49	0.82
	female	33.50	4.93		29.70	5.09	
Coping – control							
Internal LOC	male	22.67	4.59	-0.41	24.00	4.72	1.35
	female	23.86	5.76		21.46	4.96	
Chance LOC	male	23.33	7.01	2.25*	19.00	7.53	0.48
	female	16.71	3.20		17.89	5.46	
Powerful others LOC	male	20.33	4.55	-0.25	19.00	5.66	-0.13
	female	21.00	5.29		19.32	6.66	
Non productive cope	male	53.50	16.69	0.52	55.20	12.82	-1.06
	female	48.75	15.36		60.75	14.60	
Active cope	male	55.50	10.52	-0.20*	59.40	15.67	-0.48
	female	56.62	9.94		62.04	14.83	
PCOIS	male	58.00	11.45	-1.02	59.30	9.63	-0.01
	female	64.25	11.24		59.36	12.10	
Emotional suppression	male	59.67	8.82	1.66	56.90	12.09	0.54
	female	51.86	8.15		54.78	10.01	
Self efficacy	male	27.50	2.88	-1.53	30.40	4.70	0.87
	female	30.50	4.07		29.11	3.72	
Social support	male	35.67	6.38	-2.43*	34.90	3.51	-2.14*
	female	42.50	4.18		39.07	5.77	
Family Harmony	male	38.00	5.59	-1.03	36.50	5.82	-1.59
	female	41.50	6.78		39.86	5.70	
Wellbeing							
GHQ	male	25.33	4.13	0.23	23.80	3.97	-0.40
	female	24.75	5.04		24.67	6.39	
Perceived stress	male	28.00	4.29	-0.72	24.60	5.36	-1.21
	female	25.88	6.75		27.43	6.63	
Depression	male	32.67	7.19	0.69	32.60	9.56	-0.15
	female	30.12	6.01		33.04	7.42	
IBD Adjustment	male	139.00	13.70	-2.11	159.50	29.88	1.58
	female	163.00	24.97		145.86	20.77	

*p<.05; **p<.01

Table F.11 *Descriptive Statistics and t-values for Gender Differences Based on UC Severity*

		Mild UC (*n*=15)			Severe UC (*n*=23)		
		M	*SD*	*t*	*M*	*SD*	*t*
Personal disposition							
NA	male	17.50	8.246	-1.43	23.75	7.593	0.13
	female	23.57	8.101		23.25	9.301	
PA	male	35.88	4.357	0.34	34.00	7.616	1.92
	female	34.86	7.105		28.12	4.998	
Neuroticism	male	56.88	4.581	0.01	58.83	13.079	-0.26
	female	56.86	9.406		60.22	10.674	
Extraversion	male	64.12	4.581	-0.45	65.58	5.143	1.84
	female	65.86	9.299		60.89	6.585	
Optimism	male	22.00	5.071	-0.61	22.00	5.260	-0.05
	female	23.29	2.430		22.11	5.883	
Self esteem	male	29.88	2.232	-0.68	32.15	4.845	2.58*
	female	31.00	4.082		26.11	6.133	
Coping – control							
Internal LOC	male	22.88	4.12	-0.64	22.58	3.66	0.42
	female	24.29	4.39		21.56	6.65	
Chance LOC	male	17.38	5.07	-0.36	18.83	4.24	1.30
	female	18.29	4.68		16.44	4.07	
Powerful others LOC	male	21.12	6.64	0.60	20.38	6.09	1.19
	female	19.29	4.86		17.11	6.75	
Non productive cope	male	46.88	12.42	-1.00	55.38	13.67	0.53
	female	53.57	13.46		52.00	15.95	
Active cope	male	61.12	11.677	-0.41	56.77	11.58	1.75
	female	64.29	18.24		47.00	14.54	
PCOIS	male	67.25	4.77	2.62*	58.58	11.52	0.09
	female	58.57	7.87		58.11	11.90	
Emotional suppression	male	56.14	17.00	1.51	52.67	9.76	0.00
	female	43.00	15.51		52.67	13.88	
Self efficacy	male	28.00	2.14	-0.55	30.46	3.60	2.52*
	female	29.17	5.57		27.00	2.40	
Social support	male	39.62	6.82	0.06	38.31	5.78	0.25
	female	39.43	5.53		37.56	8.59	
Family Harmony	male	42.88	5.19	0.01	38.54	5.14	0.86
	female	42.86	5.70		35.12	10.51	
Wellbeing							
GHQ	male	23.12	4.73	-0.01	24.09	3.56	-1.83
	female	23.14	6.28		27.22	4.09	
Perceived stress	male	24.38	4.78	-1.72	28.54	7.97	-0.01
	female	28.14	3.49		28.56	6.39	
Depression	male	27.12	4.88	-0.46	30.58	4.81	-0.92
	female	28.43	6.00		33.11	7.83	
IBD Adjustment	male	150.25	17.90	-0.51	159.54	23.64	1.05
	female	156.86	31.01		149.33	20.19	

*p<.05

Appendix G: Correlation Matrix for the Comparison Groups

Table G.1 *Correlation Matrix for IBD and non-IBD Groups*

Non IBD \ IBD	N	E	NA	PA	Optimism	Self Esteem	NP Coping	Active Coping	Internal LOC	Chance LOC	PO LOC	PCOIS	Self Efficacy	Supp	Social Support	Family Harmony	GHQ	Stress	Depn	IBD Adj
Personal disposition																				
Neuroticism	-	-.14	.41**	-.17	-.45**	-.63**	.62**	.10	-.08	.24*	-.18	-.64**	-.38**	.29**	-.32**	-.40**	.35**	.51**	.56**	-.49**
Extraversion	-.25*	-	.08	.41**	.46**	.38**	-.05	.37**	.14	-.18	-.14	.22*	.37**	-.30**	.29**	.21	-.09	-.07	-.09	.19
Negative Affect	.63**	-.18	-	-.19	-.35**	-.35**	.43**	.06	-.11	.15	.03	-.51**	-.10	-.02	-.10	-.21	.64**	.68**	.50**	-.40**
Positive Affect	-.17	.40**	-.08	-	.36**	.41**	-.15	.48**	.36**	-.04	.02	.31**	.40**	-.22*	.25*	.11	-.32**	-.22*	-.44**	.37**
Optimism	-.42**	.32**	-.33**	.46**	-	.51**	-.40**	.19	.19	-.24*	-.07	.56**	.36**	-.24*	.43**	.41**	-.21*	-.38**	-.31**	.40**
Self-esteem	-.45**	.53**	-.31**	.62**	.60**	-	-.43**	.13	.25*	-.11	.19	.60**	.61**	-.25*	.39**	.37**	-.45**	-.48**	-.56**	.55**
Coping - Control																				
Non productive coping	.51**	-.17	.40**	-.06	-.13	-.22*	-	.21*	-.02	.33**	-.01	-.52**	-.20	.21*	-.16	-.36**	.34**	.40**	.50**	-.55**
Active coping	.05	.26*	.13	.61**	.43**	.36**	.18	-	.08	.04	.01	.17	.27*	-.10	.17	.18	-.04	-.01	-.04	-.05
Internal LOC	.03	.11	.03	.21	.34**	.21	.02	.33**	-	-.07	-.00	.19	.33**	.09	.02	-.12	-.15	-.21	-.22*	.26*
Chance LOC	.03	.04	-.12	-.15	-.20	-.14	.19	-.19	-.29**	-	.21	-.8	-.06	.12	-.26*	-.16	.09	.08	.05	-.19
Powerful others LOC	-.04	.07	-.10	.05	-.04	-.02	.02	-.00	.07	.19	-	.07	.06	-.06	.05	.11	.01	-.02	-.08	.04
PCOIS	-.53**	.40**	-.49**	.37**	.55**	.56**	-.44**	.25*	.06	.05	.07	-	.55**	-.14	.25*	.41**	-.51**	-.66**	-.55**	.36**
Self-efficacy	-.24*	.25*	-.26*	.34**	.39**	.42**	-.27*	.34**	.30**	-.15	-.15	.54**	-	-.10	.13	.14	-.31**	-.28**	-.36**	.32**
Emotional suppression	.28**	-.46**	.17	-.19	-.36**	-.33**	.41**	-.10	.01	.14	.08	-.34**	-.32**	-	-.30**	-.18	.11	-.00	.32**	-.31**
Social Support	-.27*	.54**	-.17	.34**	.41**	.47**	-.13	.22*	.18	-.16	.05	.33**	.19	-.37**	-	.33**	-.02	-.11	-.22*	.30**
Family Harmony	-.26*	.39**	-.20	.38**	.54**	.46**	-.04	.28**	.17	-.07	-.11	.38**	.27*	-.29**	.44**	-	-.18	-.27**	-.23*	.18
Wellbeing																				
GHQ	.55**	-.22*	.57**	-.43**	-.34**	-.56**	.29**	-.11	-.08	.01	-.12	-.40**	-.26*	.27*	-.34**	-.31**	-	.67**	.60**	-.36**
Perceived Stress	.63**	-.32**	.66**	-.38**	-.45**	-.57**	.23*	-.12	-.13	-.15	-.02	-.59**	-.33**	.23*	-.20	-.52**	.64**	-	.54**	-.44**
Depression	.55**	-.39**	.56**	-.38**	-.47**	-.64**	.29**	-.18	-.01	-.02	-.03	-.49**	-.27*	.39**	-.50**	-.52**	.66**	.66**	-	-.60**

Note. Upper diagonal values = IBD; lower diagonal values = non IBD

*p<.05; **p<.01

Appendix H: Multiple Regression Analyses for IBD and non-IBD Groups

Appendix H contains regression analyses for the IBD group and the non-IBD group separately.

Tables H.1 and H.2 show the variance explained by the personal disposition and coping-control variables for each of the four wellbeing measures for the IBD participants. Personal dispositions were seen to explain 40% to 55% of the variance in wellbeing; while the coping-control measures were shown to explain 29% to 49% of the variance in wellbeing. Hierarchical multiple regression procedures were conducted (see Table H.3) and revealed that the coping-control mechanisms added to the prediction of IBD Adjustment, over and above the personal disposition measures; with a moderate degree of practical importance. This finding is worthy of future research, in terms of remedial purposes for IBD patients.

Table H.1 *Multivariate Regression Procedures for the Personal Disposition Predictors of Wellbeing for the IBD Group (n = 95)*

	Models predicting			
Personal Disposition	**GHQ**	**Perceived Stress**	**Depression**	**IBD Adjustment**
Neuroticism	-.01	.17	.31**	-.20
Extraversion	-.08	-.01	.11	-.04
NA	.60***	.54***	.26**	-.16
PA	-.14	-.02	-.33***	.19
Optimism	.22*	-.02	.10	.08
Self-esteem	-.27*	-.17	-.24*	.27*
R^2	.51	.55	.54	.40
f^2	1.04	1.22	1.17	.67

*$p < .05$; ** $p < .01$; *** $p < .001$

Note. The standardized regression coefficient (β) for each variable is presented. f^2 refers to Cohen's (1998) effect size measure for multiple regression.

Table H.2 *Multivariate Regression Procedures for the Coping - Control Predictors of Wellbeing for the IBD Group (n = 95)*

	Models predicting			
Coping – control	**GHQ**	**Perceived Stress**	**Depression**	**IBD Adjustment**
Non-productive	.11	.09	.34**	.22*
Active	.01	.06	-.00	.05
Internal LOC	-.06	-.12	-.16	.00
Chance LOC	-.02	-.08	-.17	-.51***
Powerful others LOC	.04	.04	-.00	-.04
PCOIS	-.44**	-.69***	-.32*	-.07
Self-Efficacy	-.05	.13	-.05	.16
Suppression	.07	-.08	.23*	-.17
Social Support	.12	.02	-.07	.20*
Family Harmony	-.00	-.04	.05	-.05
R^2	.29	.49	.47	.46
f^2	.41	.96	.89	.85

*$p < .05$; ** $p < .01$; *** $p < .001$

Note. The standardized regression coefficient (β) for each variable is presented. f^2 refers to Cohen's (1998) effect size measure for multiple regression.

Table H.3 *Multivariate Regression Procedures for Predicting Indicators of Wellbeing for the IBD Group*

	Models predicting							
IBD (n = 95)	**Depression**		**GHQ**		**Perceived Stress**		**IBD Adjustment**	
Personal disposition	β Step 1	β Step 2	β Step 1	β Step 2	β Step 1	β Step 2	β Step 1	β Step 2
Neuroticism	.31**	.15	-.01	-.11	.17	.13	-.20	-.07
Extraversion	.11	.12	-.08	-.04	-.01	-.04	-.04	-.02
Negative Affect	.26**	.24*	.60***	.56***	.54***	.42***	-.16	-.20
Positive Affect	-.33***	-.28*	-.14	-.15	-.02	-.01	.19	.15
Optimism	.10	.17	.22*	.25*	-.02	.04	.08	.05
Self-esteem	-.24*	-.18	-.28*	-.22	-.17	-.14	.27*	.24
R^2	.54	.54	.51	.51	.54	.54	.40	.40
Coping – Control		β Step 2		β Step 2		β Step 2		β Step 2
Internal LOC		-.07		.02		-.08		.14
Chance LOC		-.12		.02		-.07		.02
Powerful others LOC		.06		.05		.05		-.02
Non-productive		.17		-.03		-.06		-.36**
Active		.04		.07		.03		-.07
PCOIS		-.15		-.21		-.41**		-.26
Self-Efficacy		-.02		-.09		.11		.09
Suppression		.22*	¤	.12		-.06		-.15
Social Support		-.04		.13		.07		.11
Family Harmony		.01		-.04		-.02		-.07
R^2		.61		.56		.63		.55
R^2_{change}		.07		.05		.09		.15*
f^2		.18		.11		.24		.33

*p < .05; ** p < .01; *** p < .001

Note. For final models, F(16,66)=6.57, p=.26 for Depression; F(16, 66)=5.31, p=.62 for GHQ; F(16, 66)=7.09, p=.14 for Stress; F(16, 66)=4.94, p=.04 for IBD Adjustment. f^2 refers to Cohen's (1988) effect size measure for hierarchical multiple regression.

Tables H.4 and H.5 show the variance explained by the personal disposition and coping-control variables for each of the three wellbeing measures for the non-IBD participants. Personal dispositions are seen to explain 56% to 62% of the variance in wellbeing with a large degree of practical importance; while the coping-control measures were shown to explain 26% to 50% of the variance in wellbeing. Hierarchical multiple regression procedures were conducted (see Table H.5) and revealed that the coping-control mechanisms did add to the prediction of wellbeing, over and above the personal disposition measures with a moderate to large degree of practical importance. This finding is important for remedial purposes and is worthy of further research.

Table H.4 *Multivariate Regression Procedures for the Personal Disposition Predictors of Wellbeing for the non-IBD Group (n = 87)*

	Models predicting		
Personal Disposition	**GHQ**	**Perceived Stress**	**Depression**
Neuroticism	.20	.23*	.12
Extraversion	.14	.00	-.06
NA	.39***	.43***	.34***
PA	-.27**	-.16	-.05
Optimism	.16	.01	-.02
Self-esteem	-.36**	-.25*	-.41***
R^2	.56	.62	.57
f^2	1.27	1.63	1.33

*$p < .05$; ** $p < .01$; *** $p < .001$

Note. The standardized regression coefficient (β) for each variable is presented. f^2 refers to Cohen's (1988) effect size measure for multiple regression.

Table H.5 *Multivariate Regression Procedures for the Coping - Control Predictors of Wellbeing for the non-IBD Group (n = 87)*

	Models predicting		
Coping – control	**GHQ**	**Perceived Stress**	**Depression**
Non-productive	.19	.03	.17
Active	-.01	.09	-.07
Internal LOC	.00	-.14	.09
Chance LOC	-.05	-.16	-.10
Powerful others LOC	-.12	-.00	-.04
PCOIS	-.14	-.47***	-.15
Self-Efficacy	-.07	.00	.00
Suppression	.03	.02	.08
Social Support	-.18	.12	-.27**
Family Harmony	-.16	-.40***	-.32**
R^2	.26	.50	.47
f^2	.35	1.00	.89

*$p < .05$; ** $p < .01$; *** $p < .001$

Note. The standardized regression coefficient (β) for each variable is presented. f^2 refers to Cohen's (1988) effect size measure for multiple regression.

Table H.6 *Multivariate Regression Procedures for Predicting Indicators of Wellbeing for the non-IBD Group*

	Models predicting					
Non- IBD (n = 87)	**Depression**		**GHQ**		**Perceived Stress**	
Personal disposition	β Step 1	β Step 2	β Step 1	β Step 2	β Step 1	β Step 2
Neuroticism	.12	.09	.20	.21	.23*	.31***
Extraversion	-.06	.15	.14	.28*	.00	.05
Negative Affect	.34***	.38***	.39***	.42***	.43***	.40***
Positive Affect	-.05	.01	-.27**	-.29*	-.16	-.19*
Optimism	-.02	.12	.16	.24	.01	.23*
Self-esteem	-.41***	-.42***	-.36**	-.38**	-.25*	-.22*
R^2	.57	.57	.56	.56	.62	.62
Coping – Control		β Step 2		β Step 2		β Step 2
Internal LOC		.08		-.07		-.20**
Chance LOC		-.09		-.05		-.12
Powerful others LOC		-.02		-.07		.06
Non-productive		.04		-.05		-.21*
Active		-.14		.01		.07
PCOIS		.08		.09		-.24*
Self-Efficacy		.08		.03		.08
Suppression		.16		.19		.12
Social Support		-.22**		-.13		.21**
Family Harmony		-.24**		-.06		-.31***
R^2		.69		.61		.78
R^2_{change}		.12*		.05		.16***
f^2		.39		.13		.73

*$p < .05$; ** $p < .01$; *** $p < .001$

Note. For final models, F(16,67)=9.15, p=.01for Depression; F(16, 67)=6.63, p=.57 for GHQ; F(16, 67)=14.74, p<.001 for Stress. f^2 refers to Cohen's (1988) effect size measure for hierarchical multiple regression.