

**EXAMINING THE INFLUENCE OF MINDFULNESS  
IN INFLAMMATORY BOWEL DISEASE**

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By

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## **ABSTRACT**

Inflammatory Bowel Disease (IBD) is a chronic medical illness accompanied by abdominal pain, diarrhea, fatigue, and other bodily complications. Research demonstrates unique psychosocial challenges in IBD and suggests some potential benefits of mindfulness-based interventions for this population. The aim of the current research was to conduct a comprehensive examination of the potential of mindfulness-based practices in IBD. This examination consisted of three individual research projects that each contribute in a unique way to an evolving understanding of this topic. Study 1 was a systematic scoping review of psychological interventions in IBD. The objective was to determine whether there is evidence that these interventions have potential to improve outcomes in this population. Psychotherapies appear to have potential to influence physical and psychological outcomes in IBD. Evidence of the potential for psychotherapy to reduce symptoms of anxiety and depression was generally limited, however, MBIs showed some promise with such outcomes and targeted a variety of outcomes compared to other psychotherapies. Study 2 and Study 3 aimed to use qualitative and quantitative approaches to better understand how mindfulness may produce changes in this population. Study 2 utilized interpretive phenomenological analysis to explore the influence of mindfulness meditation on six individuals' experiences of living with IBD. Results suggested that mindfulness is associated with experiences of awareness, nonjudgmental experiential engagement, acceptance, self-regulation, and ultimately, resilience. Study 3 utilized a cross-sectional design to examine statistical mediators of trait mindfulness and psychological distress in IBD. Serial modelling demonstrated that self-regulation, followed by self-compassion, and then low IBD symptom interference, partly accounted for an inverse association between trait mindfulness and psychological distress. Together, results from the three individual studies build upon our

understanding of the relevance of MBIs to people with IBD by describing the effects of psychological interventions in this population (Study 1), and identifying potential mechanisms by which mindfulness exerts its effects (Studies 2 and 3). Such knowledge is important for informing research on psychological treatments in IBD and optimizing treatment success in this population.

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## **Chapter 1.**

### **Literature Review: Experiences of the Body in Chronic Illness**

In chronic illness, the person is diagnosed with a long-standing health condition that affects some region or system in the body. Given that the body is integral to the person themselves (Heggdal, 2013; Kelly & Field, 1996; Merleau-Ponty, 1945; Wilde, 2003), it becomes important to consider the influence of these bodily changes on the person. In fact, an overarching theme of qualitative literature on chronic illness is that of disruption between the body and self on a phenomenological or experiential level (Aujoulat, Marcolongo, Bonadiman & Deccache, 2008; Clarke & Griffin, 2008; Charmaz, 1995; De los Santos Mycue, 2016; Delmar et al., 2005; Ellis-Hill, Payne & Ward, 2000; Frank, 1991; Garro, 1994; Godbold, 2013; Heggdal, 2013; Hellstrom, 2001; Kabat-Zinn, 1982; Kelly & Field, 1996; Kleinman, 1988; Kralik, Koch & Telford, 2001; McGuigan-Scott, 2016; Merleau-Ponty, 1945; Öhman, Söderberg & Lundman, 2003; Osborn & Smith, 2006; Smith & Osborn, 2007; Toombs, 1988; Vamos, 1993; van Manen, 1998; Wilde, 2003; Williams, 1996). This disruption is distressing, and the distress must be navigated to adjust and secure positive outcomes. Work exploring chronic illness suggest that a common path to adjustment is acceptance (Aujoulat et al., 2008; Charmaz, 1995; Clarke & Griffin, 2008; De los Santos Mycue, 2016; Delamar et al., 2005; Frank, 1991; Heggdal, 2013; Hellstrom, 2001; Kabat-Zinn, 1982; McGuigan-Scott, 2016; Merleau-Ponty, 1945; Öhman et al., 2003; Osborn & Smith, 2006; Vamos, 1993; Wilde, 2003), one of the chief mechanisms through which mindfulness is thought to have its effects (Sauer & Baer, 2010; Hayes, Luoma, Bond, Masuda & Lillis, 2006; Kabat-Zinn, 2003).

## 1.1 Experience of the Body in Chronic Illness

A state of disruption in self-body relations arises from the impositions of chronic illness on the person. In a healthy state, the body typically goes unnoticed in day-to-day living and is taken for granted; minimal attention is allotted to the body and, consequently, it fades into the backdrop of one's field of awareness (Osborn & Smith, 2006; Toombs, 1988; van Manen, 1998; Williams, 1996). This has been described as an *embodied* state, in that the body and the self are experienced as one in the same (Kelly & Field, 1996; Wilde, 2003; Heggdal, 2013). However, when a person becomes chronically ill, the body demands attention (Osborn & Smith, 2006; Paterson, 2003; Toombs, 1988; van Manen, 1998), threatens health (Toombs, 1992; Williams, 1996), and interferes with one's sense of self and identity (Charmaz, 1995; Kelly & Field, 1996; Kralik et al., 2001; Smith & Osborn, 2007; Toombs, 1988). As a result, the person begins to experience their own body as a separate entity or an object (Jackson, 1994; Toombs, 1988). Williams (1996) describes this as *dys-embodiment*; *dys* is intended to reflect the dysfunctional state of not experiencing the body as oneself.

A compelling description of the reduction of self-body disruption in chronic illness was provided by Charmaz (1995), who described the reconciliation of the self and the body as a restoration of harmony (p. 660). *Harmony* describes the person and the body in an ideal relation: Experiencing processes simultaneously, in agreement, and with a resulting sense of unity or peace. This conceptualization was well-received, and has resulted in a wider body of research on the concepts of harmony and disharmony of body and self in chronic illness, which is briefly reviewed in the following section.

### ***1.1.1 Disharmony of Self and Body in Chronic Illness***

Disharmony in chronic illness manifests in a number of ways. First, many individuals living with chronic illness report experiencing their body as foreign. This is evident in common phrases used by people who are ill, such as, “I just don’t feel like myself today” or “I don’t feel right,” reflecting an unnaturalness of the body (Toombs, 1988). The ill body is experienced very differently than the healthy body, including the sense that it is not quite one’s own anymore (van Manen, 1998). This sense of alienation is also described in a study by Osborn and Smith (2006), during which study participants with chronic back pain reported feeling excluded or alienated by either the body or the region of the body in pain. A feeling of alienation arising from a sense of separation between body and self has also been found in stroke patients (Ellis-Hill et al., 2000). Specifically, participants described adjusting to stroke-related disability as entering into a world in which the body became foreign. Even after a year of gradually re-building a working relationship with the body, this relationship would occasionally become disrupted by the physical and psychosocial consequences of living with a *changed* body.

At the more extreme end of the spectrum of disharmonic self-body experiences are additional accounts of the body as an enemy. For instance, individuals living with inflammatory bowel disease have described their illness as a foreign invader of their bodies that they must battle against (McGuigen-Scott, 2016). In addition, using grounded theory, Heggdal (2013) identified *the body as an enemy* as a phase in adjustment to chronic illness. In this phase of adjustment to chronic illness, the body was construed as an enemy that brings about a need to escape from pain and symptoms, including through denial. Just as an enemy attack during war might be associated with responses such as counter-attacking or escaping, the threats introduced by chronic illness trigger similar responses of counter-attack or escape attempts within the self-



body complex, such as the avoidance of physical activity among people with chronic pain conditions (Leeuw et al., 2007). Heggdal's findings are in line with research showing that fear and anxiety are common among individuals with chronic illness and injury (Leeuw et al., 2007; Vlaeyen, Kole-Snijders, Rotteveel, Ruesink & Heuts, 1995), and the purported "battle" to attain life and well-being (Williams, 1996). In chronic illness, the "old 'friendly' body" becomes a source of pain, nausea, disturbed sleep, and so forth (Vamos, 1993, p. 165), which can lead to anger or even hatred toward the body (Kleinman, 1988; van Manen, 1998). Others have discussed a sense of betrayal and mistrust in the body, as one no longer has confidence in its ability to function (Godbold, 2013; Heggdal, 2013; Kleinman, 1988; van Manen, 1998; Williams, 1996). Such descriptions constitute the experience of the body as an enemy.

The body in chronic illness is also experienced as an obstacle. Associated fatigue, dependence, and pain have been found to interfere with important aspects of a person's world, such as completing daily tasks and engaging in enjoyable activities (Öhman et al., 2003). Indeed, in Heggdal's research on adjustment in chronic illness, the body was described as an obstacle to normal living, resulting from a tension between the person's will and body functioning. Such limitations are thought to largely interfere with one's sense of self or identity (Charmaz, 1995; Kelly & Field, 1996). As Charmaz (1995) puts it, people are forced to revise their identities in chronic illness and attempt to reconstruct normal living as much as possible in the midst of such limitations.

A further approach to understanding self-body disharmony in chronic illness is through the construct of shame. Kelly and Field (1996) explain that embodiment is lost when bodily demands conflict with one's desired self-presentation. In other words, the self-body disruption occurs when the self becomes threatened as the sick body is exposed to others. Loss of control

over the body, socially unacceptable aspects of chronic illness (e.g., blood, vomit, and feces), and visible changes to the body each act to threaten self-integrity (Kelly & Field, 1996; Kralik, et al., 2001; Toombs, 1988). As a result, the person is faced with feelings of embarrassment, shame, insecurity, and vulnerability, particularly within social interactions (Clarke & Griffin, 2008; Kralik et al., 2001; Smith & Osborn, 2007). In fact, for individuals with chronic pain, Smith and Osborn (2007) found that threats to the self were strongest in the public arena, and reports of a fear of judgment, isolating behaviours, and shame occurred in both familial and other social contexts. Sexuality should not be neglected as a social situation in which identity and illness interact. Kralik, Koch and Telford (2001) found that midlife women living with chronic illness experienced a disrupted relationship with their bodies in the context of sexuality. Specifically, the women experienced feelings of shame around their bodies, especially when the illness produced visible alterations to the body and interfered with physical functioning.

### ***1.1.2 Harmony of Self and Body in Chronic Illness***

A sense of self-body disruption appears to be ubiquitous in chronic illness. This raises the question of whether it is possible to regain an embodied way of living after the onset of chronic illness. According to theoretical models of chronic illness, adjustment is a continuously shifting process, with the ill body inevitability presenting periodic challenges, making its presence known (Paterson, 2001; Paterson, 2003; Stanton, Revenson & Tennen, 2007). Therefore, while the following accounts discuss a re-harmonizing of the self and body in chronic illness, or *re-embodiment* (Williams, 1996), it is likely that this is an ongoing process rather than a final resolution.

In interviews with individuals suffering from different forms of chronic illness, Delmar et al. (2005) found that restoring harmony with oneself could be best conceptualized as form of

acceptance. Patients described this acceptance as learning to live with illness and new situations by changing how they responded to illness-related experiences (Delmar et al., 2005). Acceptance as a means of reconciling self-body relations has also been described as accommodating for bodily limitations while maintaining a preferred or valued self (Aujoulat et al., 2008; Charmaz, 1995; Öhman et al., 2003; Osborn & Smith, 2006). For instance, some individuals experience acceptance as a willingness to integrate an ill self and a healthy self into a coherent sense of identity (Aujoulat et al., 2008). Charmaz's (1995) work on acceptance in chronic illness mirrors these themes of living with and accommodating for the illness and its effects, describing acceptance as struggling with rather than against bodily losses. Others suggest acceptance involves surrendering to and relinquishing control over the ill body, so that one can begin to restructure the self and illness experience, and ultimately restore harmony among self, body, and identity (Aujoulat et al., 2008; Charmaz, 1995; Hellstrom, 2001). It is evident that harmonizing the self and body in illness can occur through acceptance, which, according to individual accounts, is achieved by allowing for illness experiences.

Acceptance of illness and its implications seems to be the primary way that self-body harmony is achieved following chronic illness. Wilde (2003) proposes the usefulness of relating to the chronically ill body as a "silent partner," a concept derived from Merleau-Ponty's work on embodiment. The body as a partner is a body that becomes a subject rather than object, a special friend rather than an enemy (Wilde, 2003). Wilde speaks to the importance of such new conceptualizations when working with chronically ill patients in the context of health care:

Nurses need new ways to understand the body to guide people to adjusting to bodily changes. Perpetuating old ways of viewing the body as a diseased or misbehaving object does not offer possibilities for growth and affirmation with patients experiencing an

alteration in their embodiment... These new conceptualizations of the body affirm and empower patients and nurses by recognizing what the body can offer, even in times of brokenness and pain. (p. 173)

This conceptualization of partnering with the body may also be important in health psychology, a field that employs interventions to facilitate adjustment to chronic illness.

Similar concepts of “befriending” the body or being on friendly terms with the body are seen within the literature on chronic illness adjustment (Heggdal, 2013; Kabat-Zinn, 1982; Thomas, 2002; Vamos, 1993), and recent accounts of adjustment to chronic illness seem to support the development of such relations with the body. This research shows that learning to listen to and trust the body is an important step in adjustment (De los Santos Mycue, 2016; Heggdal, 2013; McGuigan-Scott, 2016). A foundational theme identified in De los Santos Mycue’s (2016) work on embodiment in chronic illness was a shift from feeling resentful towards the body to acknowledging its presence in an open manner. While acknowledgement is certainly not embodiment, mindfulness theories posit that body acknowledgment is a requirement for developing appreciative relations with one’s own body (Kabat-Zinn, 2005), suggesting movement towards reconciling these relations. Heggdal (2013) determined that one way individuals adjust to chronic illness is by learning about the body’s tolerance levels and responding to its signs and symptoms with trust. This theme was also found in McGuigan-Scott’s research with an IBD population. In his narrative analysis, McGuigan-Scott (2016) found that participants described a period when they recognized that the power of their illness made their body impossible to ignore. From this point on, they began attending to their body’s needs by listening and communicating with it. This process was accompanied by an acceptance of their

illness. Thus, listening to and trusting the body may be ways to restore acceptance-like relations between the self and body, a theme that is also seen in the work of Wilde (2003).

Accepting and partnering with the body in chronic illness can also involve cultivating an appreciation for the body (Wilde, 2003). Van Manen (1998) defines appreciation in this context as an affective response towards the body. According to this author, illness undermines body appreciation because of the radical bodily changes and sense of betrayal felt by the person. However, it is argued that appreciation of the body can be restored (Wilde, 2003). Specifically, research shows that focusing on the body's competencies, rather than its limitations, promotes gratitude and positive adjustment in both illness and aging (Clarke & Griffin, 2008; Heggdal, 2013).

## **1.2 Summary**

The experience of the embodied self, a state in which self and body are harmonious, is disrupted in chronic illness. This amicable self-body relation ruptures as the body begins to demand attention, threaten health, and affect one's sense of self and identity. Such changes can significantly interfere with the person's normal ways of functioning. Qualitative research demonstrates that many individuals with chronic illness experience their bodies as foreign, enemy-like, limiting, and shameful, and feel alienated with or betrayed by their bodies. In contrast, some individuals make efforts to restore relations with their bodies through acceptance of illness experiences, and more precisely, responding to the body as a partner, with awareness, trust, and gratitude. While these efforts may not result in true embodiment (i.e., living *through* the body as opposed to relating *to* it), such acceptance appears to relieve the tensions between the person and their body, and improve experiences in chronic illness.

## **Transition**

Chapter 1 reviewed the impact of chronic illness on one's sense of self and living in the body, as documented in qualitative research. To further understand the experiences of people who live with chronic illnesses, including IBD, additional literature review was conducted, and summarized in the following Chapter 2. This review focuses more broadly on mental health and well-being, including quality of life, perceived stress, anxiety and depression; first, in chronic illness, and then, specifically in IBD. An additional goal of Chapter 2 is to examine whether there is heterogeneity in adjustment to chronic illness and, if so, to consider the psychological predictors of adjustment to chronic illness.

## **Chapter 2.**

### **Literature Review: Mental Health and Well-Being in the Context of Chronic Illnesses and Inflammatory Bowel Disease**

Research dating back nearly 50 years identified the intrusiveness of chronic health conditions on psychological, physical, and social functioning (Pless & Roghmann, 1971; Pless, Roghmann & Haggerty, 1972). These observations continue to be replicated. Commonly measured outcomes in this context include physical and psychosocial interference, as well as quality of life. It has been theorized that these measures capture the degree of adjustment and coping in chronic illness (Stanton, Collins & Sworowski, 2001). Thus, research on symptom interference and quality of life has important implications for psychological treatment design and application.

#### **2.1 Interference and Quality of Life in Chronic Illness**

In chronic illness research, there is a focus on the widespread interference that can occur in an individual's daily functioning (Bjorkman et al., 2012; Garland, Thomas & Howard, 2014). This interference is seen across multiple life domains: physical functioning, social relations, and emotional well-being (Falvo, 2013). Not surprisingly, there is also evidence of reduced quality of life in chronic illness (Larsen, Pederson, Friis, Glumer & Laasgard, 2017; Wikman, Wardle & Steptoe, 2011). Understanding these outcomes is an important step towards supporting the mental health of individuals suffering from chronic illnesses.

Interference in physical functioning is common when one is chronically ill. Indeed, accumulated health problems in chronic illness have been shown to correlate strongly with decreases in physical capabilities (Balderson et al., 2012). This can pose a number of challenges for the individual. When experiencing depleted energy and loss of vitality, people may lose the

drive to engage in meaningful activities (Devins, 2010; Stanton et al., 2007), such as leisure pursuits (Devins, 2010) and time with family and friends (Servaes, Verhagen & Bleijenbergh, 2002; Smith & Osborn, 2007). Furthermore, interference in physical functioning can lead to interference in employment. Many chronically ill people lose paid work because the employer fails to provide suitable accommodations (McGonagle, Beatty & Joffe, 2014; Thomas & Taylor, 2002), and others describe financial worry and strain (Kemp, Griffiths & Lovell, 2012). Thus, the illness is seen as undermining many activities that sustain day-to-day living and a sense of self-integrity (Toombs, 1988).

Another aspect of life that may be subject to disruption in chronic illness is social relations. In particular, people have reported changes in interpersonal patterns with significant others. For instance, the partners of chronically ill people may, at times, distance themselves out of anger towards the illness (Thomas & Taylor, 2002; Warwick, 2002). There is also evidence that partners can become critical and controlling (Stephens, Martire, Cremeans-Smith, Druley & Wojno, 2006), which can contribute to distress in the ill person and to relationship strain. Interactions with children are also affected by chronic illness, with some studies suggesting that vulnerability emerges when being seen in pain (Osborn & Smith, 2007) and losing control of bodily functions (Kemp et al., 2012). Further, social interference can extend beyond familial relations. Many individuals report an inability to fulfill various social roles (Bjorkman et al., 2012), social isolation (Bedretdinova, Fritel, Zins & Ringa, 2016), and a lack of perceived social support (Lackner et al., 2010).

Interference in emotional functioning is also evident in chronic illness. A study using a national sample demonstrated that depression and anxiety are prevalent in chronic pain conditions across both developing and developed countries (Tsang et al., 2008). In another



national sample with individuals with physical conditions, the authors found that comorbid depression and anxiety were strongly associated with the number of health problems (Scott et al., 2007). While some evidence suggests in some instances, psychopathology precedes the onset of chronic illness (Maunder & Levenstein, 2008), there is also evidence that it is a consequence of either the stress of living with long-term illness (Lix et al., 2008; Sajadinejad, Asgari, Molavi, Kalantari & Adibi, 2012; Stanton et al., 2007; Zautra, Smith, Affleck & Tennen, 2001), or even, in the case of depression, an adaptive immobilizing response to prevent further illness and restore health (de Ridder, Geenen, Kuijer & van Middendorp, 2008; Strouse, 2007). Emotional disruption in chronic illness may also take the form of post-traumatic stress disorder symptoms. While not always manifesting as a clinical disorder, traumatogenic responses are sometimes seen in persons with chronic illnesses (Alonzo, 2000), especially in conjunction with significant pain (Sharp & Harvey, 2001) and invasive medical treatments (Alonzo, 2000). Finally, health-related anger can develop during long-term illness. A recent study determined that individuals who feel angry about their health status were more likely to live with a severe, chronic, and interfering health condition (Gill, Price, Dal Grande, Daly & Taylor, 2016). These findings reveal the potential for significant emotional consequences when living with chronic health limitations.

Given such interference in physical, social, and emotional functioning, it is perhaps not surprising that some individuals with chronic illnesses report diminished quality of life. Measures of health-related quality of life assess the person's experience of illness (Fitzpatrick et al., 1992; Higginson & Carr, 2001) and can vary in content (Skevington, Lotfy & O'Connell, 2004). For instance, the 36-Item Short-Form Health Survey assesses functional limitations, pain, mental health, and health perceptions (Ware & Sherbourne, 1992), whereas the World Health Organization Quality of Life measure includes domains such as the person's physical

environment, spirituality and religion, and body image (Skevington et al., 2004). Overall, research often demonstrates significantly lower quality of life among people with chronic illness compared to people without (Wikman et al., 2011), and quality of life decreases with the number of chronic illnesses a person acquires (Larsen et al., 2017).

The impact of chronic illness on functioning and quality of life differs across chronic health conditions, and it is common to see unique profiles on these outcomes across illness populations. For instance, in one study, individuals with chronic headaches reported an overall poorer quality of life than those living with asthma, musculoskeletal disorders, and hypertension (Larsen et al., 2017). In another study, quality of life varied among individuals living with cancer, diabetes, bone diseases, lung diseases, heart disease, and neurological conditions, with stroke patients reporting the most impairment (Wikman et al., 2011). This is likely a result of the varying demands across illnesses. Indeed, on measures of quality of life, heart disease appears to have more of an impact on physical functioning while arthritis impacts bodily pain (Alonso et al., 2004), reflecting the distinctive characteristics of these conditions. Interestingly, some research suggests that compared to other chronic illnesses, gastrointestinal (GI) disorders may possess characteristics that are particularly detrimental to quality of life. For example, in a mixed sample of chronic illnesses, individuals with GI conditions reported greatest impairment in mental health and health perceptions (Stewart et al., 1989). In a more recent study, GI conditions ranked in the top four of 12 conditions associated with impairment in quality of life (Sprangers et al., 2000). This suggests that developing a greater understanding of symptom interference and quality of life in individuals living with a GI condition is very important, and perhaps could assist initiatives to improve the well-being of this population.

## **2.2 Interference and Quality of Life in Inflammatory Bowel Disease**

One chronic GI condition that is associated with significant physical and psychosocial challenges is Inflammatory Bowel Disease (IBD). IBD is a chronic medical illness that primarily manifests as Crohn's disease, an inflammation of the small intestine and other areas within the digestive tract, or as ulcerative colitis, an inflammation in the colon and rectum (Sartor, 2006). Characteristic symptoms include abdominal pain, diarrhea, incontinence, fatigue, joint pain, appetite loss, weight loss, and malnutrition (Irvine, 1999). Other symptoms can include intestinal obstructions, rectal pain, and fever (Mowat et al., 2011). In severe cases, surgical removal of some or all of the intestine (i.e., ostomy surgery) may be necessitated, resulting in the need for a stoma, or surgically created abdominal opening, to divert the flow of feces (Wolfe & Sirois, 2008). Most individuals report a fluctuating disease course with intermittent flare-ups; however, up to 30% have reported consistently active IBD (Lix et al., 2008). Currently, IBD has no cure (Crohn's and Colitis Foundation of Canada [CCFC], 2012), but poses a low risk for mortality (Mowat et al., 2011). Over the past decade, Canada has at times had the highest rate of IBD in the world (CCFC, 2012).

Individuals struggling to adjust to IBD and cope with its symptoms face unique challenges. Kemp, Griffiths, and Lovell (2012) completed a meta-synthesis of themes documented in qualitative investigations of the health and social needs of individuals with IBD. These themes included fear of incontinence, as well as fear of long-term effects of illness, such as progression, death, or passing the disease along to their children. Shame, described as painful feelings of embarrassment and vulnerability when managing bowel symptoms in social contexts, also featured prominently in the results. Isolation was evident too, constituted by the co-occurring fear of incontinence and avoidance behaviour (i.e., abstaining from social activities

and events). Finally, individuals with IBD described a continuous struggle to identify which aspects of their illness could be improved or controlled and which must simply be accepted or tolerated. In more recent works, some of these themes continue to be replicated. Thompson (2013) documented experiences of shame in IBD as individuals struggled to maintain their “private selves” in the face of socially censored symptoms. In McGuigen-Scott’s (2016) work on illness adjustment, IBD was experienced as a foreign invader of the body, triggering the need for “battle” and control against the illness. Taken together, this work into the experiential descriptions of IBD alludes to the challenges faced by individuals living with IBD.

IBD also interferes with physical functioning. Given the high potential for pain symptoms, pain anxiety and pain catastrophizing are common in Crohn’s disease patients (Lix et al., 2008), and are also closely linked to disability (Leeuw et al., 2007; Vlaeyen et al., 1995). Exercise is also a known problem in this population. A review on exercise interventions in IBD suggests there are low rates of physical activity in IBD (Shephard, 2016), which may be related to the fatigue, joint pain, and incontinence experienced by this population (DeFilippis et al., 2016). Active disease can also affect employment, with approximately 20% of this population reporting IBD-related sick leaves, and reduced physical functioning and vitality correlating with employment disability (Bernklev et al., 2006).

Interference in social relations is common in IBD. A qualitative analysis revealed the intruding nature of IBD symptoms on social relations, including parenting, relationships, and engaging in recreational activities (Devlen et al., 2014). Many patients experience symptoms as embarrassing (Chang et al., 2006; Denters et al., 2013) and describe a need to maintain close proximity to restrooms (Hall, Rubin, Dougall, Hungin & Neely, 2005; Kemp et al., 2012). An impaired body image has also been reported, which may develop from feeling self-conscious of

symptoms of bloating (Chang et al., 2006; Sajadinejad et al., 2012), or in cases of surgery, from insecurity with wearing a stoma. Sexual issues are evident as well. There have also been reports of a fear of sexual inadequacy, concerns with intimacy, and feeling dirty (Mauder, Toner, Rooy & Moskovitz, 1999; Sajadinejad et al., 2012). Perhaps not surprisingly, both body image and sexuality concerns have been found to be more common in women IBD patients than men (Chang et al., 2006; Mauder et al., 1999). It has been speculated that this is a result of Westernized cultural expectations for women to be attractive and concealing of bodily functions (Chang et al., 2006; Mauder et al., 1999).

IBD is associated with interference in emotional well-being and poor mental health. In line with this is research showing poor emotional quality of life to be associated with diseases with systemic symptoms, as opposed to localized symptoms (Do, Edwards & Finlayson, 2015), and certainly, the physical effects of IBD extend beyond the intestine (e.g., fatigue and joint pain). During flare-ups, rates of anxiety and depression have been found to be as high as 80% for the former and 60% for the latter, but these rates drop substantially during remission (Sajadinejad et al., 2012). Some research suggests anxiety is more common than depression in this population (Burkhalter et al., 2015). Other forms of psychopathology have been found in IBD as well. Lifetime prevalence rates of panic disorder, generalized anxiety, obsessive-compulsive disorders, and major depression were found to be higher in IBD compared to the general population (Walker et al., 2008). Moreover, stress, anger, shame, self-consciousness, poor emotional regulation, and helplessness are common experiences in IBD (Jordan, Sin, Fear & Chalder, 2016; Kemp et al., 2012).

A recent study examined quality of life in IBD (Williet et al., 2017). The sample consisted of 1185 IBD patients belonging to the French National IBD Charity. Of these, over

half (53.3%) reported low levels of quality of life across physical and psychosocial domains. Quality of life was most impaired in the domain of physical functioning, followed by bodily pain, and then emotional roles. Lower quality of life was more likely to occur in those who were women, unemployed, suffering from a flare, or taking medication, as well as in those with a history of surgery. Gibson et al. (2007) produced findings in line with this. Relatively poor quality of life was reported in IBD groups with and without IBD-related complications, and quality of life became more impaired as disease severity worsened. Evidently, IBD can take a toll on the individual's overall quality of life, as living with this condition poses the possibility of interference across physical, social, and psychological functioning.

### **2.3 Heterogeneity in Adjustment**

It is important to acknowledge that life with a chronic illness does not guarantee suffering. It is evident that there is significant variability in degrees of adjustment. Indeed, a review of the existing literature on psychological correlates of negative adjustment in IBD suggests certain psychological factors may underlie poor adjustment. These factors include personality and interpersonal traits, emotional well-being and coping, and cognitive functioning (Jordan et al., 2016). Likewise, research with other chronic illness populations suggests that how an individual responds or adjusts to chronic illness is partly determined by psychological processes (Arran, Craufurd & Simpson, 2014; Bombardier, D'Amico & Jordan, 1990; Falvo, 2013; Meijer, Sinnema, Bijstra, Mellenbergh & Wolters, 2002; Sirois, Molnar & Hirsch, 2015; Stone, Broderick, Porter & Kaell, 1997; Vlaeyen et al., 1995). This implies that adjustment to chronic illness; in this case, IBD, could potentially be improved through psychological interventions.

## **Transition**

Chapter 2 makes clear that a chronic illness like IBD can interfere with mental health and well-being, including quality of life, perceived stress, and anxiety and depression. Given that psychological factors can influence adjustment to chronic illness, psychological interventions may help to support psychological outcomes in IBD. A review of psychological interventions in IBD is presented in Chapter 3. Given the relatively low number of IBD psychotherapy trials, a scoping review was conducted. This approach to systematic review is considered rigorous method to determine the extent of research on a topic, and to identify research gaps (Munn et al., 2018). The review focuses on the range of psychotherapies that have been examined in IBD, and the degree of evidence available to date for each of these interventions. The implications are then discussed in relation to the range of outcomes studied in IBD.

## Chapter 3.

### Study 1: A Systematic Scoping Review of Psychological Interventions in Inflammatory Bowel Disease

#### NOTE TO COMMITTEE MEMBERS:

*The following is a component of a manuscript published in World Journal of Gastroenterology in 2018. The original manuscript was a review of lifestyle and complementary therapies for IBD, and I co-authored this manuscript in conjunction with the lead author (a post-doctoral student in medicine) and the second author (a registered dietician) as well as our respective research supervisors. In the original manuscript, the lead author reviewed physical activity and exercise as a complementary therapy, the second author reviewed diet modifications as a complementary therapy, and I reviewed psychotherapies. In the version of the manuscript I am presenting here, the exercise and diet portions of the review are omitted, and the introduction and discussion are rewritten to focus strictly on psychotherapy as a complementary disease management approach in IBD. This review constitutes the first of three studies within my dissertation.*

Duff, W. R. D., Haskey, N., Potter, G. K., Alcorn, J., Hunter, P. V. & Fowler, S. (2018). Non-pharmacological therapies for inflammatory bowel disease: Recommendations for self-care and physician guidance. *World Journal of Gastroenterology*, 24(28), 3055-3070.

#### 3.1 Introduction

IBD is associated with negative psychosocial outcomes, such as a poor quality of life (Gibson et al., 2007), anxiety and depression (Goodhand et al., 2012), and avoidance coping (Jordan et al., 2016; Kemp et al., 2012). Such outcomes may be a product of the disease (Kurina, Goldacre, Yeates) or contributing factors (Maunder & Levenstein, 2008). Given that psychological functioning can affect one's sense of well-being (Stein & Heimberg, 2004) and physical health (Foster & McVey Neufeld, 2013), stress management and mental health treatment may be important for maintaining a good quality of life and health in IBD.

Living with IBD is often associated with various life challenges. Physical functioning can become limited and symptoms can interfere with work attendance. Compared to the general



population, those with IBD have significantly higher rates of sick leave and unemployment (Bernklev et al., 2006). Maintaining exercise can also be challenging in IBD, with individuals describing interference from fatigue, joint pain, and incontinence symptoms (DeFilippis et al., 2016). In addition, disruptions in social function have been known to arise, with individuals reporting concerns about symptom management while attending social events (Hall et al., 2005; Kemp et al., 2012), and feelings of embarrassment, shame, and insecurity in close relationships (Chang et al., 2006; Maunder et al., 1999; Sajadinejad et al., 2012). Further, emotional struggles have been identified in this population. Common emotional experiences include general feelings of stress, IBD-related stress, anger, shame, self-consciousness, poor emotional regulation, and helplessness (Jordan et al., 2016; Kemp et al., 2012).

Going beyond emotional struggles, there is evidence of psychopathology, and particularly anxiety and depression, as a correlate of IBD. Some research suggests anxiety is more common than depression in this population (Burkhalter et al., 2015). During flare-ups, rates of anxiety and depression have been found to be as high as 80% for the former and 60% for the latter, although these rates do drop substantially during remission (Sajadinejad et al., 2012). Other forms of psychopathology have been found in IBD as well. For instance, lifetime prevalence rates of panic disorder, generalized anxiety, obsessive-compulsive disorders, and major depression were found to be higher in IBD than in the general population (Walker et al., 2008).

It is important to acknowledge that life with a chronic illness does not guarantee suffering; there can be significant variability in degrees of adjustment. For example, a review of the existing literature on psychological correlates of negative adjustment in IBD yielded six factors: (1) personality traits (neuroticism, perfectionism, negative affect, and social inhibition); (2) interpersonal traits (insecure attachment); (3) perceived stress and coping (avoidance); (4)

emotions and emotional control (hostility and expressed aggression, emotional control, alexithymia, and private self-consciousness); (5) IBD-related cognitions (stigma, lack of social support, feeling misunderstood, negative disease outcomes, external locus of control, low self-efficacy, symptom intolerance, and behavioural disengagement); (6) non-IBD related cognitions (low self-esteem and hopelessness) (Jordan et al., 2016). Research into adjustment in other forms of chronic illness also suggests that individuals' responses to chronic illness are partly determined by psychological factors (Arran et al., 2014; Bombardier et al., 1990; Falvo, 2013; Meijer et al., 2002; Sirois et al., 2015; Stone et al., 1997; Vlaeyen et al., 1995). This implies that adjustment to and coping with IBD could potentially be improved through psychological interventions.

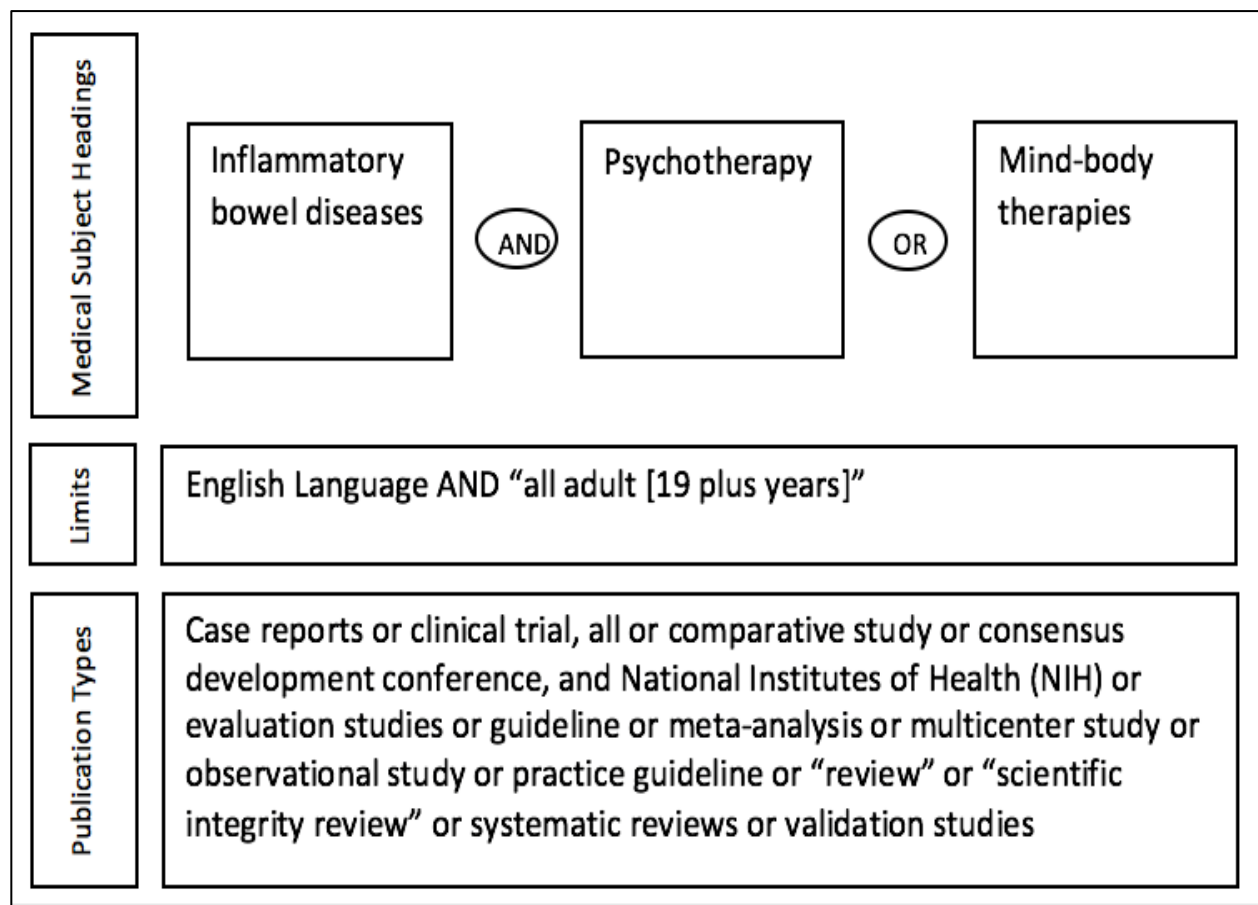
### **3.1.1 Current Study**

The aim of the present study was to conduct a systematic scoping review of literature on psychological interventions in IBD. The first objective of the study was to (1) identify the types of psychotherapies that have been examined in IBD and describe these, including adaptations for IBD and nature of measured outcomes. A second objective was to (2) determine whether there is evidence that these interventions have potential to improve outcomes in this population. Overall, such knowledge was thought to inform both the design and research of psychological interventions for this population.

## **3.2 Methods**

A scoping review was performed to summarize the types of psychotherapies that have been examined in IBD and potential effects of psychological interventions on IBD outcomes. The search strategy employed in this review was developed in consultation with a University of Saskatchewan librarian. To conduct a comprehensive search of the literature on this topic, the

search criteria were kept broad. As an initial step in the search process, the Ovid MEDLINE database was searched using the medical subject heading terms ‘Inflammatory Bowel Diseases’, exploded to include more specific terms ‘Colitis, Ulcerative’ and ‘Crohn Disease’. This controlled vocabulary was used to ensure all relevant articles were identified. As a second step in the search process, this set of results was limited to articles describing psychological interventions. Specifically, articles classified under the medical subject heading terms ‘psychotherapy’ or ‘mind-body therapies’ were included. See Figure 3.1.



*Figure 3.1* Scoping review methods on psychological interventions in IBD

In addition, the search was limited to articles written in the English language and pertaining to adults above the age of 19. The following types of articles were considered: clinical trials, comparative studies, case reports, consensus development conferences, evaluation studies, meta-analyses, multicenter studies, observational studies, practice guidelines, systematic reviews, and validation studies. After the Ovid MEDLINE search, similar searches of EMBASE: Excerpta Medica, EMBASE: Classic, PubMed, and PsycINFO were conducted, and these search results were pooled.

To be included in the final set of search results, articles were required to be clinical trials (with or without randomization). This final criterion was established because, in addition to summarizing the types of psychotherapies in IBD, the goal was to also summarize the outcomes of the interventions. As a first step in this process, articles that clearly did not meet this criterion on the basis of the title or abstract were screened out. For example, if an article was a published protocol of a psychological therapy for IBD, then it was excluded. Then, all remaining articles were fully reviewed for applicability. Finally, the reference lists of eligible articles were reviewed to identify additional articles.

Additional decision points on inclusion and exclusion had to be considered when conducting the review. For example, in some studies, individuals with both IBD and IBS were examined. In these cases, the studies were excluded as the aim was to focus on solely on IBD, and there is some evidence to suggest a difference between these populations. As well, one study examined two different types of psychotherapies for IBD but did not analyze the results separately for each intervention. Because the goal was to describe the outcomes of specific types of psychological interventions, the study was excluded.

### **3.3 Results**

A total of 40 articles were identified in MEDLINE. In EMBASE, 58 articles were identified, but only 18 were distinct from those already identified in MEDLINE. Although PsycINFO was also searched, no new articles were identified. Thus, a total of 58 articles were retrieved. At this point, title and abstract screening was completed to determine whether the retrieved articles met inclusion criteria. This step reduced the final pool of articles to 24. An additional 5 articles were identified from reference sections of included articles, as well as references in a review article and a case study. This produced a total of 29 studies for review.

#### **3.3.1 Psychological Interventions in IBD**

In accord with the objectives of this systematic scoping review, the following content was reviewed and summarized: intervention category; adaptations for IBD; and nature of outcomes. To provide a brief synopsis of results, among the 29 articles identified for review, eight types of interventions were employed: Cognitive Behavioural Therapy (CBT), Mindfulness-Based Interventions (MBIs), Psychodynamic Therapy, Hypnosis, Stress-Management, Supportive-Expressive Group Therapy (SEGT), Solution-Focused Therapy (SFT), and Multi-Component Behavioral Treatment (MCBT). Most had been specifically adapted to IBD-related concerns. Those that had not been adapted included some MBIs and stress management therapies. A more detailed overview of the outcomes associated with each of these therapies follows.

##### ***3.3.1.1 Cognitive Behavioural Therapy (CBT)***

CBT is a collaborative problem-solving approach between the client and therapist that aims to challenge and modify maladaptive thoughts and behavior (Hofmann, Asnaani, Vonk, Sawyer & Fang, 2012). It is one of the most widely available psychotherapies; at present, most psychotherapists utilize a cognitive-behavioral approach (Dobson & Dobson, 2009).

Each of the six CBT studies identified in the review had been adapted to IBD, with more than one study employing a particular adaptation found at [tameyourgut.com](http://tameyourgut.com). In this therapy, individuals are prompted to consider goals related to disease management (e.g., diet), and develop an awareness of connections between stress and IBD symptoms. Cognitive exercises incorporate some examples relevant to disease management, IBD-related concerns, and pain coping. As well, assertiveness training is extended to the context of communicating with health care professionals.

Various psychosocial outcomes have been evaluated in studies of CBT for IBD. One such outcome is IBD-related concerns. Following a CBT group with IBD patients ( $n = 28$ ), IBD-related concerns decreased significantly from pre- to post-treatment and changes were maintained at 9-month follow-up (Mussell, Böcker, Nagel, Olbrich & Singer, 2003). Using the Rating Form of IBD Patient Concerns (RFIPC), concerns that were reduced included: Impact of Disease (Pre = 39.4, Post = 28.3,  $p = .007$ ), Complications (Pre = 37.1, Post = 23.6,  $p = .018$ ), and Sexuality (Pre = 33.3, Post = 22.4,  $p = .039$ ). No significant reduction was found for Body Stigma (Pre = 24.6, Post = 20.9). IBD-related quality of life has also shown improvement following CBT interventions; however, these changes appear to be short-lived (Díaz-Sibaja, Comeche-Moreno, Mas-Hesse, García & Pareja, 2009; Keefer, Doerfler & Artz, 2012a; McCombie, Gearry, Andrews, Mulder & Mikocka-Walus, 2016). Following CBT, patients also report significantly lower substance use for coping (McCombie et al., 2016), and women report less depressive coping styles at 9-month follow up (Mussell et al., 2003). To date, studies on CBT fail to demonstrate improvement in comorbid IBD and anxiety (i.e., an individual having both IBD and anxiety)(McCombie et al., 2016; Mikocka-Walis et al., 2015; Mikocka-Walis et al., 2016), and effects on depression are mixed. Both computerized and face-to-face forms of

CBT have been ineffective at reducing depression in some studies (McCombie et al., 2016; Mikocka-Walis et al., 2015; Mikocka-Walus et al., 2016), although a face-to-face intervention did lead to less depression symptoms in women in one study (Mussell et al., 2003).

Some research has explored whether the effects of CBT for patients with IBD depends on the level of psychiatric comorbidity. For instance, in one study, CBT led to short-term improvements in health-related quality of life (QOL) and coping abilities, but only in IBD patients with high mental health needs (Mikocka-Walus et al., 2015). In another study, using a sample with low levels of psychological distress ( $n = 28$ ), a piloted CBT intervention improved outcomes on the IBD-related quality of life scale (IBDQ), IBD Self-Efficacy Scale, and Perceived Stress Questionnaire (PSQ) (Keefer et al., 2012a). Within some other studies showing positive outcomes of CBT for IBD (Díaz-Sibaja et al., 2009; Mussell et al., 2003), psychiatric illness has been an exclusion criterion.

Physical health outcomes have also been examined in studies of CBT for IBD. In a randomized controlled trial (RCT) with both Crohn's disease (CD) and ulcerative colitis (UC) patients ( $n = 174$ ), neither face-to-face nor computerized CBT had significant effects on disease activity as measured by the Crohn's Disease Activity Index (CDAI) and the Simple Clinical Colitis Activity Index (SCCAI) (Mikocka-Walus et al., 2015). Furthermore, following treatment, a nearly equal number of patients in the treatment and control groups remained in remission (CBT: 73.2%, Controls: 71.7%,  $p = .868$ ), and an analysis of a 2-year follow-up on this study showed no impact on disease activity measures (Mikocka-Walus et al., 2016). In another RCT, a computerized form of CBT for IBD patients ( $n = 199$ ) failed to produce any significant effects on clinical index measures (McCombie et al., 2016). A 12-week uncontrolled CBT group

intervention for IBD patients was not associated with any significant change on clinical indexes or in medication use (Mussell et al., 2003).

### ***3.3.1.2 Mindfulness-Based Interventions (MBIs)***

Mindfulness can be conceptualized as a non-judgmental, accepting, and intentional quality of attention towards unfolding present-moment experiences (Christopher, Charoensuk, Gilbert, Neary & Pearce, 2009; Kabat-Zinn, 1990; Kabat-Zinn, 2003). Mindfulness originates from Eastern philosophies and was introduced to Western medicine by Jon Kabat-Zinn who, in 1979, created the Mindfulness-Based Stress Reduction (MBSR) program for patients with chronic illness (Kabat-Zinn, 1990; Vollestad, Neilsen & Neilsen, 2012). MBSR has been used to enhance stress coping within various chronic conditions such as heart disease, cancer, hypertension, headaches, chronic pain, and epilepsy. Currently, mindfulness is a component of multiple psychotherapies, such as MBSR, Mindfulness-Based Cognitive Therapy, Acceptance and Commitment Therapy, and Dialectical Behavioral Therapy.

It was largely unclear whether the MBIs identified in this systematic scoping review had been adapted for IBD. The authors of one article noted that MBI instructors were made aware of common IBD-related concerns prior to delivering the intervention; however, the authors did not clarify how, if at all, this information was incorporated into the MBI. The authors of the three other MBI studies did not mention IBD-specific adaptations. Nevertheless, it is important to note that MBSR was designed to be applied to chronic illness; thus, other MBIs derived from this approach may not have required specific adaptations.

The articles identified for this review gave some evidence that mindfulness improves psychosocial outcomes in IBD. MBIs helped to improve health-related QOL (Berrill, Sadliar, Hood & Green, 2014), maintained QOL during flare ups (Jedel et al., 2014), and reduced



depression and anxiety (Gerbarg et al., 2015; Schoultz, Atherton & Watson, 2015). They also facilitated advice-seeking as a coping strategy (Berrill et al., 2014) and reduced perceived stress (Berrill et al., 2014).

There is some evidence IBD patients with higher levels of stress or more severe abdominal symptoms may reap greater benefit from mindfulness interventions. Jedel and colleagues (2014) failed to find significant effects of MBSR on anxiety, depression, or perceived health competence among people with UC. However, in a double-blind RCT with UC patients ( $n = 55$ ), MBSR completers with a high severity of gastrointestinal symptoms at baseline demonstrated a greater reduction in the hindrance of bowel symptoms (IBDQ-bowel subscale) compared to MBSR participants with less severe symptoms – an effect that was not seen in the control group ( $p < .001$ ) (Jedel et al., 2014). Similarly, Berrill and colleagues found therapeutic benefits in an IBD sample with high levels of stress (PSQ) and/or functional abdominal symptoms (Irritable Bowel Syndrome Symptom Severity Scale) (Berrill et al, 2014).

Currently, there is limited evidence supporting the efficacy of MBIs in reducing disease activity in IBD, as measured by clinical indexes and biomarkers of inflammation (Berrill et al, 2014; Schoultz et al., 2015). The aforementioned RCT with UC patients demonstrated that MBSR completers with high stress levels (PSQ) exhibited reduced flare ups post-treatment compared to those in the control group with high stress levels ( $p < .0001$ ) (Jedel et al., 2014). Moreover, the meditative techniques used by Gerbarg et al. (2015), including breathing, body postures, movement, and elements of mindfulness, proved to be effective at reducing an inflammatory biomarker, CRP, in a group of 29 IBD patients, although it remains unclear which intervention component(s) were responsible for these effects. However, Berrill et al. (2014)

failed to find any effects of MBI on inflammation and Schoultz et al. (2015) found no significant changes in disease activity after treatment with MBI.

### ***3.3.1.3 Short-Term Psychodynamic Psychotherapy***

Psychodynamic therapy examines previously unrecognized aspects of the self, especially as they arise in the therapeutic relationship (Shedler, 2010). Short-term psychodynamic therapy typically includes weekly sessions spanning up to twelve months. While short-term psychodynamic therapy for IBD has maintained its classic focus on maladaptive interpersonal patterns and intrapsychic conflicts, IBD-specific adaptations, such as the use of health education and autogenic training, have also been incorporated. Autogenic training teaches patients systematic repetition of phrases to induce bodily changes, such as slower breathing or heartrate, or increased temperature in specific regions of the body (Milne, Joachim & Niedhardt, 1986). The overarching goal of the short-term psychodynamic therapy is to promote self-efficacy in relation to disease management and coping with IBD.

The effect of short-term psychodynamic therapy combined with autogenic training was examined in a prospective, multicenter RCT targeting relaxation, health behaviors, and coping. The three separate analyses that comprised this RCT examined the influence of this psychodynamic intervention on psychosocial status (Keller et al., 2004), disease course (Jantschek et al., 1998), and health care use (Deter et al., 2007). The sample comprised 108 CD patients across four treatment centers and patients completed an average of 47 weeks of therapy. In terms of psychological outcomes, no significant differences were found between the treatment group and controls with respect to depression (Beck Depression Inventory [BDI]), anxiety (State Trait Anxiety Inventory [STAI]), or QOL (German Quality of Life Scale) (Keller et al., 2004). The therapy also failed to show any promising results on measures of disease course, including

the CDAI and physical assessments (Jantschek et al., 1998). However, the treatment group displayed significantly less hospital days and sick leave days, reflecting lower health care use (Deter et al., 2007).

#### **3.3.1.4 Hypnosis**

Hypnosis is described as “an ability to sustain a state of attentive, receptive, intense focal concentration with diminished peripheral awareness in response to a signal” (Spiegel & Spiegel, 2008). Clinically, hypnosis is delivered by suggesting to clients that they experience changes in either their mind or body, a process facilitated by relaxation and vivid imagery (Kirsch, Montgomery & Sapirstein, 1995). There is evidence of its lasting effects on health and well-being in psychological and/or physical conditions, with proposed mechanisms including cognitive and immune changes (Gruzelier, 2002).

As a psychological intervention for IBD, the clinician adapts the hypnotic suggestions, making them specific to the disease and its characteristics. For instance, in the studies reviewed, the clinician delivered hypnotic suggestions to improve psychological and gastrointestinal health (e.g., “A powerful healing wave of change is spreading deep inside your body...”; Keefer et al., 2013, p. 764). Others combined visualization of inflammation-changes with sensory stimuli (i.e., warm hand placed on abdomen) to provide an experience of relief from gastrointestinal inflammation and symptoms (Mawdsley, Jenkins, Macey, Langmead & Rampton, 2008; Miller & Whorwell, 2008).

Among the most common outcomes examined in studies of hypnosis for IBD are psychological ones. In Keefer et al.’s (2012b) RCT with UC patients ( $n = 37$ ), a 7-session hypnosis intervention produced effect sizes in the small to moderate range on QOL and self-efficacy measures: IBDQ-bowel subscale ( $d = 0.50$ ), IBDQ-systemic health subscale ( $d = 0.48$ ),

IBDQ-total scale ( $d = 0.41$ ), and the IBD Self-Efficacy Scale ( $d = 0.34$ ). Improvements in QOL ratings were also seen in another study of hypnosis (Miller & Whorwell, 2008), but Keefer et al.'s (2013) study found no significant effects on this outcome. On other psychological outcomes, Keefer et al. (2012b) found no significant effects on perceived health competence, perceived stress, IBD-related concerns, or medication adherence. Mawdsley and colleagues assessed measures of psychological distress in UC patients undergoing hypnosis but the findings did not suggest hypnosis reduced anxiety, depression, or perceived stress (Mawdsley et al., 2008).

Both subjective and objectives measures of disease activity in IBD have also been examined, with outcomes showing promising findings. Miller and Whorwell (2008) observed long-term reductions in disease severity (clinical assessments) and steroid use (i.e., the primary drug used in IBD to reduce inflammation) after hypnosis, although this was an uncontrolled study with a small sample size ( $n = 13$ ). Keefer et al. (2013) reported that following seven sessions of hypnosis, those in the treatment condition of an RCT had a significantly higher number of days until relapse compared to controls,  $F = 4.8$  (1, 48),  $p = 0.03$ , and 68% of patients in the treatment condition maintained remission (subjective markers of flare) for one year, whereas this was the case with only 40% of the controls,  $\chi^2$  (1) = 3.9,  $p = 0.04$ . Indeed, in an RCT in which hypnosis was used to treat UC ( $N = 25$ ), biomarkers of autonomic activity and inflammation were significantly reduced within 30 minutes following a single 50-minute session of hypnosis (Mawdsley et al., 2008). Specifically, hypnosis had significant effects on heartrate, reduced serum interleukin-6 levels (a measure of systemic inflammation) by 53%, and reduced three of six measures of rectal inflammation.

### ***3.3.1.5 Stress Management***

In the context of health care, stress management is described as an intervention that promotes self-management of illness symptoms, psychosocial stress, and general well-being (Novak, Costantini, Schneider & Beanlands, 2013). In this review, studies were classified as stress management interventions if they either provided education on stress and/or coping, or utilized relaxation techniques.

Approximately half of the stress management studies reviewed appeared to incorporate IBD-specific adaptations. Adapted interventions focused on IBD-related stressors, such as coping with the diagnosis (Oxelmark, Magnusson, Löfberg & Hillerås, 2007), managing diet and nutrition (Larsson, Karlbom, Nordin, Anderberg & Lööf, 2003), and coping with life adjustments during illness (Smith et al., 2002). Interventions without IBD adaptations relied on classical stress management techniques, such as deep muscle relaxation (Mizrahi et al., 2012; Shaw & Ehrlich, 1987) and training in communication skills (Milne et al., 1986).

All stress management studies included a focus on psychological outcomes. In most studies that assessed disease-related stress, ratings on the IBD-related QOL scale and IBD Stress Index were significantly reduced post-treatment (Boye et al., 2011; Milne et al., 1986; Mizrahi et al., 2012). Anxiety, as measured by the Hospital Anxiety and Depression Scale (HADS) and STAI, is also effectively targeted by these interventions (Larsson, et al., 2003; Smith et al., 2002). However, there is a lack of support for the use of stress management for IBD patients with depression comorbid with IBD (Larsson et al., 2003; Oxelmark et al., 2007; Smith et al., 2002), and, at present, evidence for improvement in coping is equivocal (Oxelmark et al., 2007; Smith et al., 2002).

Studies assessing disease activity following stress management interventions show mixed results. Milne, Joachim, and Niedhardt (1986) found significant reductions in clinical index scores (CDAI) following a stress management program for IBD patients. However, two recent studies showed no effect on disease activity as measured by clinical indices (Boye et al., 2011; Smith et al., 2002). Nevertheless, stress management interventions have improved self-reported pain and other symptoms. For example, in three RCTs using relaxation training for IBD patients, significant reductions were found on the Visual Analogue Scale (VAS) (Mizrahi et al., 2012), McGill Pain Questionnaire and Pain and Distress Scale (Shaw & Ehrlich, 1987), and symptom-monitoring diaries (Garcia-Vega & Fernandez-Rodriguez, 2004). In contrast, Oxelmark and colleagues failed to find any significant reductions on the VAS in a sample with low levels of disease activity (Oxelmark et al., 2007).

#### ***3.3.1.6 Supportive-Expressive Group Therapy (SEGT)***

SEGT is designed for individuals with chronic illness, and aims to ease feelings of shame and isolation through emotional expression in a supportive group setting (Maunder & Esplen, 2001). One study examined SEGt in the context of IBD (Maunder & Esplen, 2001). In this case, SEGt was IBD-adapted. The main objective was to encourage participants to express their thoughts and feelings about IBD-related challenges in the presence of others with this disease.

Maunder and Esplen (2001) examined SEGt with IBD patients ( $n = 30$ ) in a prospective, uncontrolled pilot study. On psychological measures, there were no significant changes post-treatment in IBD-related concerns, such as disease consequences and complications, sexual intimacy, and body stigma. There were also no significant changes on IBD-related QOL, or anxiety or depression. Despite no statistically significant changes in coping, the proportion of maladaptive coping behaviour did appear to reduce from 48.2% to 35.5% post-treatment ( $p =$

.05). On measures of IBD symptoms, no statistically significant changes occurred post-treatment in this underpowered study but there did appear to be a trend toward a reduction in symptoms, Pre = 11.0 (6.5), Post = 9.2 (4.7),  $p = 0.14$ .

### ***3.3.1.7 Solution-Focused Therapy (SFT)***

SFT is a brief, strengths-based form of psychotherapy that focuses on the individual's adequate coping abilities (Vogelaar et al., 2011). Only two studies have assessed the value of this therapy in IBD (Vogelaar et al., 2011; Vogelaar et al., 2014). The interventions were adapted to target IBD-related fatigue. Psychoeducation was provided on IBD and fatigue, and participants built upon existing coping skills while exploring possible solutions to managing fatigue in IBD.

In the first study, SFT was compared against a longer-term problem-solving therapy and a control condition in CD patients with high levels of fatigue ( $n = 40$ ) (Vogelaar et al., 2011). Pre- and post-treatment measures were obtained on measures of fatigue, quality of life, anxiety, depression, and hospital costs. No significant differences were found between treatment groups and controls on any of the psychological outcomes, which may have been due to a small sample size. In a more recent study (Vogelaar et al., 2014), SFT was compared to treatment-as-usual in 98 individuals with high IBD-related fatigue. Treatment lasted 6 months in total, with measures obtained at baseline, 3-months, 6-months, and 9-months. Post-treatment, individuals in the treatment group exhibited lower fatigue scores on the Checklist of Individual Strength measure than individuals in the control group ( $p = 0.03$ ); however, this effect was not sustained at 9-months follow-up ( $p = 0.61$ ). The authors found short-term therapeutic effects on QOL (IBDQ) ( $p = 0.02$ ) and depression (HADS) ( $p = 0.03$ ) following SFT; however, no significant differences in anxiety were found between the treatment group and controls. In this study, SFT did not have any significant effects on clinical indexes, sleep quality, medication use, or blood parameters.

### **3.3.1.8 Multi-Component Behavioral Treatment (MCBT)**

MCBT is a psychological intervention that combines education, muscle relaxation techniques, training in coping, as well as the addition of thermal biofeedback (Schwarz & Blanchard, 1991). One study evaluated the influence of this intervention in IBD (Schwarz & Blanchard, 1991), this study relied on disease-specific education and coping training to appropriately contextualize the intervention.

Schwarz and Blanchard (1991) conducted a wait-list RCT using MCBT with 21 IBD patients. Using the BDI, STAI, IBD Stress Index, Hassles Scale, and Psychosomatic Symptom Checklist, significant changes occurred for the treatment group in IBD-related stress ( $p < 0.0025$ ), depression ( $p < 0.0025$ ), and number of hassles ( $p < .001$ ). On a self-report of IBD symptoms, a significantly greater number of controls reported symptom reductions than the treatment group following the study (82% versus 65%,  $\chi^2 = 14.58$ ,  $p < 0.01$ ). However, after controlling for disease type, patients with CD demonstrated significant reductions in IBD symptoms, whereas patients with UC did not. At the end of the study, all individuals described an improved ability to cope and weight gain.

### **3.3.2 Overview of Results**

Table 3.1 summarizes the degree of support that presently exists for each of the therapies. Given that research on psychotherapy for IBD is at a very early stage of development, the term “support” is based on consistency, one of four major criteria used by the *Agency for Healthcare Research and Quality* to determine the strength of evidence (Owens et al., 2010). In this case, consistency was operationalized as over 50% of studies showing benefit. Therapies that met or exceeded this criterion were deemed to have “promising” evidence to date. This term



Table 3.1

*Supporting evidence for psychological interventions in IBD*

	CBT	MBIs	PD	Hyp	SM	SEGT	SFT	MCBT
IBD-Related Distress	✓			x	✓	x		M
Quality of Life	✓	✓	x	✓	✓	x	x	
Anxiety	x	✓	x	x	✓	x	x	x
Depression	M	✓	x	x	x	x	M	M
Coping	✓	✓			M	x		✓
Self-Efficacy/Health Competence	✓	x		M				
Perceived Stress	✓	✓		x	x			x
Disease Activity	x	M	x	✓	M		x	
IBD Symptoms					✓	x		M
Pain					✓			
Medication Use				✓				
Fatigue							M	
Health Care Use			✓				x	
Sick Days			✓					
Weight Gain								✓

*Note.* Grey Squares = Outcome has not been assessed; White Squares = Outcome has been assessed; ✓ = Promising evidence for therapeutic benefits (i.e., More than 50% of the studies assessing outcome showed statistically significant effect); M = Mixed evidence of therapeutic benefits (i.e., 50% or less of the studies assessing outcome showed statistically significant effect); x = No evidence of therapeutic benefits (i.e., None of the studies assessing outcome showed statistically significant effect)

CBT = cognitive behavioural therapy, MBIs = mindfulness-based interventions, PD = psychodynamic therapy, Hyp = hypnosis, SM = stress management, SEGT = supportive-expressive group therapy, SFT = solution-focused therapy, MCBT = multicomponent behavioural therapy

acknowledges that there is a continued need for research on the efficacy of these therapies for IBD. Table 3.2 provides a summary of the findings.

### **3.4 Discussion**

The aim of this systematic scoping review was to present the current state of knowledge concerning the efficacy of psychological interventions to support people with IBD. From this review, it was evident that a total of eight forms of psychological intervention have been examined with this population, with CBT, MBIs, hypnosis, and stress management more frequently investigated, and others, including psychodynamic therapy, supportive-expressive group therapy, solution-focused therapy, and multicomponent behavioural therapy, less frequently investigated. Outcomes evaluated in these studies have included disease activity, general psychological wellbeing, and psychopathology (particularly IBD-comorbid anxiety and depression).

#### **3.4.1 Disease Activity**

Given evidence that mental and physical health can be reciprocally related (Foster & McVey Neufeld, 2013), it is important to evaluate whether psychotherapies have potential to influence physical health. Improvements in IBD activity following psychological intervention may be indicative of improvements in mental health (e.g., decreased stress), and may act as a safeguard against future IBD-related stress. Of the studies that examined disease activity, outcome measures ranged from subjective reports of IBD symptoms to objective markers of disease activity.

Hypnosis was the only intervention to show promise in reducing disease activity. Studies showed that measures of inflammation (Mawdsley et al., 2008), medication use (Miler & Whorwell, 2008) and subjective reports of disease symptomology showed long-term reductions

Table 3.2

*Summary of scoping review findings by intervention type*

Therapy	Summary	References
CBT	CBT may be useful for developing adaptive coping skills <sup>1,2,3</sup> , reducing general and IBD-related stress, <sup>2</sup> and improving quality of life. <sup>1,3,4,5</sup> Therapeutic gains are observed in individuals with varying degrees of distress. <sup>2,3,4</sup> Outcomes for anxiety and depression have been inconsistent. <sup>1,2,3,4,6</sup>	<sup>1</sup> McCombie et al., 2016 <sup>2</sup> Mussell et al., 2003 <sup>3</sup> Mikocka-Walis et al., 2015 <sup>4</sup> Díaz-Sibaja et al., 2009 <sup>5</sup> Keefer et al., 2012a <sup>6</sup> Mikocka-Walus et al., 2016
MBIs	MBIs seem to promote adaptive coping and reduce stress <sup>8</sup> . These interventions also maintain quality of life during flare-ups, particularly among individuals with moderate-severe distress or moderate-severe abdominal symptoms <sup>8,9</sup> . However, evidence for managing anxiety and depression, <sup>10</sup> as well as disease activity, <sup>9,11</sup> is currently inconsistent.	<sup>8</sup> Berrill et al., 2014 <sup>9</sup> Jedel et al., 2014 <sup>10</sup> Schoultz et al., 2015 <sup>11</sup> Gerbarg et al., 2015
HYP	Hypnosis demonstrates promise for managing disease activity. <sup>12,13,14</sup>	<sup>12</sup> Miller & Whorwell, 2008 <sup>13</sup> Keefer et al., 2013 <sup>14</sup> Mawdsley et al., 2008
SM	There is some evidence that stress management improves anxiety <sup>15,16,17</sup> , reduces IBD-related stress <sup>16,18</sup> , and improve quality of life. <sup>16,19</sup> There is also some evidence that it may help with pain <sup>16,20,21</sup> and symptom management. <sup>21</sup>	<sup>15</sup> Larsson et al., 2003 <sup>16</sup> Mizrahi et al., 2012 <sup>17</sup> Smith et al., 2012 <sup>18</sup> Milne et al., 1986 <sup>19</sup> Boye et al., 2011 <sup>20</sup> Shaw & Ehrlich, 1987

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		<sup>21</sup> Garcia-Vega & Fernandez-Rodriguez, 2004
PD	Only one trial of short-term psychodynamic therapy has been conducted with IBD patients. This study found significant reductions in health care use. <sup>22</sup>	<sup>22</sup> Deter et al., 2007
SEGT	Only one study assessed SEGT in IBD. No significant effects were found. <sup>23</sup>	<sup>23</sup> Maunder & Esplen, 2001
SFT	Only two studies assessed SFT in IBD. These studies showed mixed evidence for effects on fatigue and depression. <sup>24,25</sup>	<sup>24</sup> Vogelaar et al., 2011 <sup>25</sup> Vogelaar et al., 2014
MCBT	Only one study assessed MCBT in IBD. This study showed mixed results on measures of IBD symptoms, IBD-related distress, and depression, and promising results for weight gain and coping. <sup>26</sup>	<sup>26</sup> Schwarz & Blanchard, 1991

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*Note.* CBT = cognitive behavioural therapy, MBIs = mindfulness-based interventions, PD = psychodynamic therapy, HYP = hypnosis, SM = stress management, SEGT = supportive-expressive group therapy, SFT = solution-focused therapy, MCBT = multicomponent behavioural therapy

(Keefer et al., 2013), some of which followed very brief interventions (Mawdsley et al., 2008). Such findings are in line with other work done on the effects of hypnosis. Immune functioning has shown to be altered by hypnosis, including B- and T-cells, helper cells, and suppressor cells (Ruzyla-Smith, Barabasz, Barabaz & Warner, 1995). As well, in a sample of medical students, a hypnotic intervention using immune-related imagery led to fewer viral illnesses, and produced significantly more reductions in white blood cell counts than in the relaxation-imagery condition (Gruzelier, Levy, Williams & Henderson, 2001). Although the mechanisms of action are unclear and have only been speculated upon (Guducuoglu, Bilgili & Arslan, 2015; Keefer et al., 2013), hypnosis may be beneficial for individuals with active IBD, particularly those who wish to use

disease management approaches other than medication or who require alternatives to medication for other reasons (e.g., women planning to conceive).

A number of studies of stress management interventions also examined disease activity using clinical indices. Some of these also included self-reported symptoms and pain, which can be considered crude indicators of IBD activity, since perceptions of symptoms can change independently from the symptoms themselves. While results for disease activity were mixed, stress management interventions showed some potential for pain and other symptoms associated with IBD (Garcia-Vega & Fernandez-Rodriguez, 2004; Mizrahi et al., 2012; Shaw & Ehrlich, 1987). Stress management interventions typically foster active coping with disease (Novak et al., 2013). A scan of the intervention components suggests that those studies showing a significant effect on pain and IBD symptoms focused less on IBD education, and more on active relaxation training, such as deep muscle relaxation. Training in relaxation is known to help reduce pain in other pain conditions (Emery, France, Harris, Norman & VanArsdalen, 2008; Miller & Perry, 1990; Stuckey, Jacobs & Goldfarb, 1986), and has been found to be superior to education in reducing abdominal pain following intestinal and urological surgeries (Good et al., 2010). This focus on active coping through relaxation strategies may explain the improvements in IBD pain and symptoms in these particular studies.

Pain outcomes were less likely to be evaluated in evaluations of other psychotherapies for IBD. This exclusion is surprising considering recent research shows over half of IBD patients to experience back and joint pain, in addition to pain associated with abdominal symptoms (van der Have et al., 2015). Thus, while stress management has promise for pain management in IBD, it is as yet unclear whether other interventions may also have potential to improve pain outcomes in

this population. Promoting consistency in evaluation of outcomes would be a worthwhile goal in future IBD intervention studies.

### **3.4.2 Psychological Well-Being**

IBD has been associated with negative psychosocial outcomes (Gibson et al., 2007; Goodhand et al., 2012; Kemp et al., 2012), including interference in physical, social, and emotional functioning (Bernklev et al., 2006; Hall et al., 2005; Chang et al., 2006). Given that such negative experiences can affect one's sense of well-being (Stein & Heimberg, 2004) and physical health (Mroczek et al., 2013; Foster & McVey Neufeld, 2013), it is essential to understand how best to assist individuals in maintaining a good quality of life in IBD. The majority of studies in this review examined outcomes associated with psychological well-being. These outcomes primarily consisted of coping, general and IBD-related distress, and general and health-related quality of life.

Coping was examined across many of the reviewed interventions. Both CBT and MBIs are generally known to promote adaptive coping responses and build skills for engaging with difficult experiences (Hayes, Villatte, Levin & Hildebrandt, 2011). Results of studies of CBT for IBD provide evidence consistent with this generalization. CBT reduced over-reliance on drugs and alcohol for coping (McCombie et al., 2015), decreased depressive coping styles in women (Mussell et al., 2003), and improved coping despite significant mental health issues (Mikocka-Walis et al., 2015). While coping was less frequently examined in studies of MBIs, outcomes were positive, showing that individuals were more proactive in seeking advice following MBIs (Berrill et al., 2014). Finally, multi-component behavioural therapy, which offers patients a wide range of strategies to increase the chances of successful coping across various situations (Barlow,

Wright, Sheasby, Turner & Hainsworth, 2002), also led to improvements in coping when applied in IBD (Schwarz & Blanchard, 1991).

Disease-related distress in IBD, including general perceived stress, was also assessed in many of the studies. Relative to other psychotherapies, CBT and stress management proved to be most effective for managing IBD-related distress. This finding may be accounted for by the IBD-specific adaptations within these therapies, as some evidence shows that symptom-related stress is reduced when psychological interventions are tailored to the health condition (Buhrman et al., 2013; Karlsen, Idsoe, Dirdal, Hanestad & Bru, 2004). In terms of stress that is not specific to IBD, CBT and MBIs appear more likely to reduce perceived stress than other interventions. This is consistent with previous research results showing that these therapies also reduce psychological stress in other conditions, including arthritis (Rosenzweig et al., 2010) and HIV (Sabet, Khalatbari, Ghorbani, Haghighi & Ahmadpanah, 2013).

The extent to which general and health-related quality of life improved varied across the different types of interventions for IBD. There was more evidence that CBT, MBIs, and stress management produced improvements in quality of life, as compared to other interventions (Berrill et al., 2014; Boye et al., 2011; Diaz-Sibaja et al., 2009; Jedel et al., 2014; Keefer et al., 2012a; McCombie et al., 2016; Mikocka-Walis et al., 2015; Mizrahi et al., 2012). Although there was some evidence that hypnosis improved quality of life, this was primarily evident on the quality of life subscales relating to physical health, which may be explained by less disease activity following hypnosis. The finding that CBT, MBIs, and stress management are associated with improved quality of life in IBD is line with other research on quality of life in chronic illness. For instance, in irritable bowel syndrome – a functional bowel condition that shares some symptoms with IBD – CBT, MBIs, and stress management have been shown to improve quality

of life (Ebrahimi et al., 2015; Kamkar, Golzary, Farrokhi & Aghaee, 2011; Zomorodi, Tabatabaie, Azadfallah, Ebrahimidaryani & Arbabi, 2015). While such findings are promising, the mechanisms by which psychotherapies act to improve quality of life in chronic illness are as yet poorly understood.

Some recent empirical research and theoretical discussions have focused on mechanisms of therapeutic change in quality of life across chronic illness populations. A potential mechanism that may underlie such change is the individual's coping response. In a study of diabetes management, training in coping improved quality of life in chronic illness above and beyond education on disease management (Grey, Boland, Davidson, Li & Tamborlane, 2000). In line with this are theoretical models proposing that people with chronic illness can attain a good quality of life by shifting responses to illness interference (Sprangers & Schwartz, 1999), adjusting personal value systems (Bishop, 2005), or accepting losses (Keany & Glueckauf, 1999), each of which reflect adaptive coping. Thus, CBT, MBIs, and stress management approaches might improve quality of life in IBD by better equipping individuals to cope with common IBD-related interferences.

In CBT and MBIs, therapeutic gains in quality of life were achieved despite the maintenance of high levels of stress (Berrill et al., 2014; Diaz-Sibaja et al., 2009; Jedel et al, 2014; Mikocka-Walis et al., 2015) and active illness (Berrill et al., 2014; Jedel et al, 2014). This finding is not new, as others have shown that behavioural and mindfulness techniques can increase psychological and physical functioning in chronic pain, even in the absence of decreased stress and pain (Dahl, Wilson & Nilsson, 2004; Kabat-Zinn, Lipworth & Burney, 1985). This integration of wellness and illness also underlies the philosophy of current psychological interventions, like MBSR and dialectical behavior therapy, and of models of



adjustment to chronic illness (e.g., Paterson's Shifting Perspectives Model of chronic illness; Paterson, 2001; Paterson, 2003).

Through involvement in CBT and MBIs, individuals with IBD appear to be able to experience a good quality of life while also living with ongoing stressors. This resiliency mirrors broader findings concerning adjustment to chronic illness. This work demonstrates that despite heterogeneity in adjustment, it is possible to “live well” with chronic illness. In addition, specific psychological factors are believed to underlie this resilience (Arran et al., 2014; Bombardier et al., 1990; Gormsen, Rosenberg, Bach & Jensen, 2010; Falvo, 2013; Jordan et al., 2016; Meijer et al., 2002; Sirois et al., 2015; Stone et al., 1997; Vlaeyen et al., 1995; Wang et al., 2008). It might be that CBT and MBIs for IBD influence risk factors associated with poor adjustment, such as neuroticism, insecure attachment, and avoidance. Similarly, these therapies might also promote the development of protective factors in the midst of illness and stress.

### **3.4.3 Anxiety and Depression**

While this review provided evidence that some psychotherapies hold promise for improving aspects of health and well-being in IBD, evidence that psychotherapies hold promise for treating IBD co-morbid anxiety and depression is equivocal; in fact, more studies have failed to demonstrate potential for improvement than otherwise. This is an important problem given that anxiety and depression are commonly seen in this population (Sajadinejad et al., 2012). It is possible that the mechanisms of change promoted in some psychotherapies are a better match to IBD than the mechanisms emphasized in other psychotherapies. For instance, of the therapies reviewed, MBIs were the only ones to show promise for treating both anxiety and depression in IBD. Stress management also showed promise, but only for reducing anxiety.

Other research speaks to the efficacy of MBIs on anxiety and depression in chronic illness. According to meta-analyses conducted on MBIs in medical conditions, these therapies produce a small, albeit consistent, effect on anxiety and depression (Bohlmeijer, Prenger, Taal & Cuijpers, 2010; Grossman, Neimann, Schmidt & Walach, 2004). Acceptance and commitment therapy, a psychological intervention that centralizes mindfulness, produced small to large effects on anxiety and depression across nine studies with chronic pain populations (Hann & McCracken, 2014). A systematic review of MBIs in breast cancer showed moderate to large effect sizes on depression ( $d = .56, p < .001$ ) and anxiety ( $d = .73, p < .001$ ) (Zainal, Booth & Hubbert, 2013). This suggests that it will be important to continue to investigate the potential of MBIs for patients with IBD.

Given that MBIs have largely been designed for chronic illness populations, such findings are not surprising. Kabat-Zinn's MBSR program, a major catalyst for the application of MBIs in Western psychology, was designed to promote attitudes of acceptance and compassion towards one's own moment-to-moment experiences in stress and chronic illness (Kabat-Zinn, 1990). These components of the intervention may be particularly well-suited to the mental health needs of people with chronic illness. That is, people living with chronic medical conditions often experience significant and realistic concerns, such as pain, illness relapse, and symptom interference in daily functioning. Thus, therapies that focus primarily on unrealistic cognitions, or on less directly relevant considerations, such as the nature of one's experience in relation to others, might be poorly matched to the needs of this population.

Stress management interventions were shown to reduce anxiety in IBD. Similar results have been found in individuals with HIV (Scott-Sheldon, Kalichman, Carey & Fielder, 2008) and congestive heart failure (Luskin, Reitz, Newell, Quinn & Haskell, 2002). It may be that these

interventions target underlying mechanisms known to sustain anxiety. For instance, two mechanisms thought to contribute to anxiety are uncertainty (Ladouceur, Gosselin & Dugas, 2000) and bodily tension (Pluess, Conrad & Wilhelm, 2009). The education component of stress management programs may work to ease such uncertainty, and deep muscle relaxation techniques used may mitigate bodily tension. Of those studies showing improvement in anxiety following stress management, both education and relaxation training were part of the interventions.

It may be that individuals with IBD co-morbid anxiety and depression require interventions that foster coping skills that can be applied across multiple situations. Indeed, although the MBIs identified in this review were not adapted to IBD, they showed more evidence for reducing anxiety and depression than (mostly) IBD-specific interventions. Recent research supports this line of reasoning. In a randomized control trial for rheumatoid arthritis, greater reductions in anxiety were found following a mindful acceptance treatment that enhanced coping with various aversive experiences in comparison to CBT and education conditions that were both tailored to disease-coping (Davis, Zautra, Wolf, Tennen & Yeung, 2015). As well, a meta-analysis on MBIs demonstrated their efficacy on mental health outcomes across a broad range of psychological and physical health conditions (Grossman et al., 2004). Mindfulness works to develop a resilient, internal perspective that can be cultivated in any moment of experience. This form of intervention may better equip individuals to manage a broader range of life adversities, consequently, preventing anxiety and depression.

A key problem with the current literature on psychotherapies for IBD is that the optimal format and content of the treatment has yet to be identified. This problem has also been observed in other chronic health populations. In a recent review of CBT for chronic pain, the authors

identified a current gap in the literature: understanding optimal treatment dose, format, and content (Ehde, Dillworth & Turner, 2014). Similarly, the authors of a review of self-management interventions for use in chronic illnesses argued that individuals may become better at managing the physical, emotional, and social repercussions of their condition if the focus of these interventions is less on disease management and more on building broader coping skills (Newman, Steed & Mulligan, 2004).

The goal to identify optimal treatment formats for chronic illness, such as whether these interventions should include disease specific adaptations or focus more holistically on the person, is aligned with the goal of understanding mechanisms of therapeutic change. Researchers are beginning to recognize the importance of identifying such mechanisms in psychotherapy, arguing for a better understanding of how to tailor therapies for optimal change (Kazdin, 2007). Given that IBD can, at times, significantly impose on the physical, psychological, and social functioning of the individual, resolving this issue is imperative.

#### **3.4.4 Strengths and Limitations**

Systematic scoping reviews survey existing literature and provide a useful way to synthesize evidence (Pham et al., 2014). For instance, identifying the consistency of empirical evidence is one of four important factors in determining whether a particular psychotherapeutic intervention is evidence-based (Owens et al., 2010). But there are some limitations associated with this research. First, given the limited number of studies of psychotherapy for IBD, this scoping review considered not only randomized controlled trials (the highest quality form of evidence) but also any other clinical trial, including uncontrolled pre-post studies, and non-randomized trials. These alternative formats are known to be less reliable; for instance, the lack of control in some studies creates the limitation that some of the positive results documented in

the review may not have resulted from the therapies. Second, case studies were excluded from this review, since the focus was on exploring efficacy, rather than developing a rich understanding of individual experiences. Although the case study methodology was not well matched to the goals of this review, case studies can be of use for developing a deeper understanding of therapeutic change. One current difficulty with psychotherapies for IBD is that the mechanisms by which psychotherapy influences psychosocial outcomes in IBD remains poorly understood. Further examination of other lines of evidence might be helpful in this regard. Finally, this review did not attempt to draw conclusions about effect sizes associated with psychological interventions for IBD, as would be typical in meta-analytic research. This is because not enough evidence was available to systemically compare across the therapies (Borenstein, Hedges, Higgins & Rothstein, 2009), as some intervention types were only examined in one or two studies. As the evidence base for IBD expands, it will be important to further address this.

### **3.4.5 Future Directions**

This study points to some future research needs concerning psychotherapy for IBD. First, given the promise that psychotherapies appear to hold for outcomes including physical health, symptoms of psychopathology, and global well-being, including quality of life, it is important to continue to evaluate the evidence of these therapies through high-quality randomized controlled trials. Nevertheless, one current difficulty with psychotherapies for IBD is that the mechanisms by which psychotherapy influences psychosocial outcomes in IBD remains poorly understood. For instance, hypnosis seemed to be a superior therapy for health-related outcomes, MBIs for psychopathology, and CBT for coping. While these broad observations offer a first step toward understanding potential mechanisms of therapeutic change, much more information is needed.

Relatedly, some therapies surveyed in this review were specifically adapted to IBD and some were not. The degree to which therapies must be adapted in order to have effect requires further study, and will also help to promote an understanding of mechanisms of therapeutic change. Finally, the only studies that evaluated pain as an outcome were those of stress management. This is very surprising, considering that pain is a common experience in IBD. Future studies incorporating such measures would help expand our understanding of how, if at all, psychological interventions can improve pain management for individuals living with IBD, especially given that pain is increasingly understood as a biopsychosocial experience (Hadjistavropoulos et al., 2011; McWilliams, Cox & Enns, 2000; Melzack, 2001).

### **3.5 Conclusion**

Psychological interventions have potential to influence a variety of physical and psychological outcomes in IBD. Hypnosis demonstrated promise for managing disease activity, while stress management showed some potential for reducing pain and symptoms. Disease-related distress was targeted by CBT and stress management interventions, and coping was enhanced through MBIs, multicomponent therapy, and most evidently, CBT. While stress management supported outcomes of general well-being, MBIs and CBT led to improvement in quality of life, despite the presence of stressors. Although evidence of the potential for psychotherapy to reduce symptoms of anxiety and depression was generally limited, MBIs and stress management therapies did show promise. Research must now turn to the outcomes targeted by each type of psychotherapy, and the mechanisms by which these therapies exert their effects.

## **Transition**

Chapter 3 suggests that some psychological interventions might be more useful for addressing particular outcomes than others (e.g., hypnosis for disease activity, and CBT or MBIs for quality of life). The review also illustrates that to date, MBIs are associated with a fuller range of positive outcomes for patients with IBD than are other psychotherapies. Assuming these findings hold as more research on psychotherapy in IBD is conducted, it will be important to develop a better understanding of precisely how MBIs support people with IBD to achieve a range of positive outcomes. Having this knowledge will allow psychotherapists to better tailor interventions to the needs of people with IBD, in order to optimize outcomes. In Chapter 4, the development of MBIs is briefly reviewed, and theory and research about the mechanisms of change in MBIs is then reviewed.

## **Chapter 4.**

### **Literature Review: Mindfulness and Mechanisms of Change in Chronic Illness**

Mindfulness is described as an intentional, non-judgmental, and accepting quality of attention towards unfolding present-moment experiences (Kabat-Zinn, 1990; Kabat-Zinn, 2003). Although mindfulness developed within ancient traditions, primarily Buddhist sects, it is thought to be universally applicable (Kabat-Zinn, 2003). Mindfulness was introduced to Western medicine by a medical professor at the University of Massachusetts, Jon Kabat-Zinn (Kabat-Zinn, 2003). In 1979, Kabat-Zinn created and implemented a very successful Mindfulness-Based Stress Reduction (MBSR) program for patients suffering from chronic illness (Kabat-Zinn, 1990; Vollestad et al., 2012). The practice of mindfulness has since been translated into a number of promising psychotherapies, such as Cognitive Behavioural Therapy (CBT), Mindfulness-Based Cognitive Therapy (MBCT) (Teasdale, Segal, & Williams, 1995; Teasdale et al., 2000), Acceptance and Commitment Therapy (ACT), Dialectical Behavioural Therapy (DBT), Compassionate Mind Training, and Mindful Self-Compassion (Baer, 2015; Gilbert & Proctor, 2006; Neff and Germer, 2013).

#### **4.1 Mindfulness: Potential Implications in IBD**

The American Psychological Association journal *Psychotherapy* published an article outlining the empirically-supported benefits of mindfulness (Davis & Hayes, 2011). These included emotional regulation, decreased reactivity, increased response flexibility, enhanced interpersonal functioning, and improved cognitive capabilities (Davis & Hayes, 2011). A meta-analysis of MBIs for anxiety and depression demonstrated large effect sizes in clinical populations (anxiety disorders: Hedge's  $g = .97$ ,  $p < .01$ ; depressive disorders: Hedge's  $g = .95$ ,  $p < .01$ ) (Hofmann, Sawyer, Witt & Oh, 2010). In addition, Vollestad, Neilsen and Neilsen (2012)



found large effect sizes in their systematic review of mindfulness and acceptance-based therapies for anxiety and co-morbid depression. Moreover, Mindfulness-Based Cognitive Therapy for depression was found to lead to lasting effects throughout nearly five years of follow-up (Munshi, Einsendath & Delucchi, 2013). While there is less research into alternative delivery formats for MBIs (such as Internet-delivered and self-guided modes of intervention), there is some preliminary evidence that delivering MBIs through these modes improves mental health outcomes (Cavanaugh, Strauss, Forder & Jones, 2014; Spijkerman, Pots & Bohlmeijer, 2016).

There is also evidence for the efficacy of MBIs among people with comorbid health and mental health symptoms. For example, a review of MBSR and MBCT for individuals with vascular diseases found that these forms of therapy had a small to moderate effect on stress levels, depression, and most evidently, anxiety (Abbott et al., 2014). A review of these same therapies yielded similar results but with somatization disorders (Lakhan & Schofield, 2013). Of particular significance, the benefits of MBIs demonstrate longevity in the context of chronic health conditions. For example, a study with female fibromyalgia patients found that MBSR led to both physical and psychological health improvements that were maintained at 3-year follow up (Grossman, Tiefenthaler-Gilmer, Raysz & Kesper, 2007). In a study of individuals with Irritable Bowel Syndrome (IBS), a mindfulness-based intervention produced greater long-term effects than did CBT (Zomorodi, Abdi & Tabatabaee, 2014).

A small number of studies have evaluated MBIs in IBD ( $k = 4$ ). Despite inconsistent evidence for their efficacy in reducing disease activity (Berrill et al., 2014; Gerbarg et al., 2015; Jedel et al., 2014; Schoultz et al., 2015), there are promising results for psychological outcomes. In contrast to other psychotherapies, MBIs demonstrate some promise for reducing anxiety and depression in IBD (Gerbarg et al., 2015; Schoultz, et al., 2015). Recent randomized control trials

of Acceptance and Commitment Therapy (ACT) for IBD found depression, anxiety, and stress to be significantly reduced by 39% (Wynne et al., 2019) and 42% post-intervention (Rowan et al., 2017). Further, mindfulness has primarily been found to improve health-related quality of life in IBD (Berrill et al., 2014), with evidence suggesting it can maintain quality of life during flare ups (Jedel et al., 2014). There is also some evidence that mindfulness can facilitate advice-seeking as a coping strategy and reduce perceived stress (Berrill et al., 2014). In conclusion, mindfulness has the potential to maintain and enhance psychological functioning in IBD.

#### **4.2 Mechanisms of Mindfulness**

Researchers are beginning to recognize the importance of identifying mechanisms that are leading to positive outcomes in psychotherapy for various populations. Kazdin (2007) contends that researchers need to examine change mechanisms in psychotherapy if they are to better understand how to tailor therapies for optimal change. This is important in the context of IBD, as psychotherapies have so far shown limited support for treating anxiety and depression in IBD (Duff et al., 2017), suggesting a need for revisions of current interventions. As well, Lilienfeld, Ritschel, Lynn, Cautin and Latzman (2014) emphasize that understanding mechanisms of change in psychotherapy will help to confirm that it is indeed the therapy leading to change. Mental health professionals working with IBD populations rely on evidence-based practice; therefore, knowing what therapeutic components are indeed facilitating change will help support decision-making in clinical practice.

Thus far, there has been some growth in the literature on mechanisms of change in mindfulness. Theoretical models have identified a number of possible mechanisms underlying mindfulness. Shapiro, Carlson, Astin and Freedman's (2006) model primarily addresses mechanisms such as intention, attention, attitude, perspective shifts, self-regulation, values

clarification, experiential exposure (i.e., associational learning), and cognitive flexibility. Decentering and cognitive defusion, described as the cognitive process of relating to thoughts as transitory mental events (Sauer & Baer, 2010), have also been proposed as change mechanisms. Other theories emphasize the importance of stress appraisals in facilitating change from mindfulness (Creswell & Lindsay, 2014). Also proposed as a mechanism of change has been spirituality. Together, mindfulness and spirituality have been shown to lead to less psychological distress and medical symptoms (Carmody, Reed, Kristeller & Merriam, 2008).

Recent systematic reviews on mechanisms of change following MBIs have also been conducted using mediation analyses. Mediation is a statistical process that enables researchers to identify mechanisms of change (Kazdin, 2007); variables are considered mediators when they account for a causal relationship between two other variables (Hayes, 2013). In a systematic review of MBSR and MBCT, researchers examined mediators of positive psychological outcomes in studies using clinical and community samples (these samples were combined in the results). There was sufficient evidence for changes in rumination, worry, and global measures of mindfulness as consistent mediators of psychological outcomes from these interventions; however, evidence was limited for cognitive flexibility and self-compassion (Gu, Strauss, Bond & Cavanaugh, 2015).

A systematic review of MBIs compared mediators of change between individuals with psychological and physical conditions. Alsubaie et al. (2017) found that increases in trait mindfulness and decreases in rumination were associated with positive psychological outcomes in both psychological and physical illness, with worry and self-compassion emerging as additional mediators for individuals with psychological conditions. These authors concluded that some mechanisms of mindfulness might be universal and others disease-specific, and encourage

further research on this subject. As a result, certain mechanisms of mindfulness might be particularly relevant to IBD, and lead to positive outcomes for this population.

Two mechanisms that might be particularly important to the success of MBIs are acceptance and self-compassion. Kabat-Zinn speaks to the necessity of these attitudes when cultivating mindfulness. He explains that acceptance and compassion contribute to the proper conditions for healing: acceptance provides mental clarity and adaptive responding (Kabat-Zinn, 1990), while compassion complements this process with an affectionate quality of attending to one's own suffering (Kabat-Zinn, 2003). While acceptance has gained some acknowledgment as a potential mechanism of mindfulness in chronic illness, such as in acceptance-based therapies for chronic pain (McCracken & Vowles, 2014), the mechanism of self-compassion has been less studied in this context.

#### ***4.2.1 Acceptance***

According to current thinking in the field of psychotherapy, acceptance is arguably the primary mechanism of mindfulness. Acceptance involves embracing experiences as they are rather than using suppression, avoidance, denial, or other techniques to change them (Dobson & Dobson, 2009; Hayes, 2004, Kabat-Zinn, 2003; Linehan, 2015; Sauer & Baer, 2010). It is also distinguishable from resignation, in that resignation suggests grieving a loss, while acceptance connotes welcoming change. Acceptance is cultivated in different ways across existing MBIs. For example, MBSR develops acceptance through formal and informal meditation that involves a receptive and welcoming attitude toward present-moment experiences (Kabat-Zinn, 1990). ACT promotes acceptance through cognitive defusion, which involves exercises that decrease reactivity to thoughts (e.g., avoidance or judgment), such as by observing the present-moment thought and assigning it a shape, size, or color (Hayes, Luoma, Bond, Masuda & Lilis, 2006).

DBT trains acceptance using mindfulness, as well as behavioural activities, such as acting in ways that would reflect acceptance (e.g., open hands and posture, content facial expression, approaching difficult situations) (Linehan, 2015). However, the common rationale behind using acceptance seems to be that a person's suffering will ease once they can attend fully to the qualities of their experience in the moment rather than pursuing their reactions to an experience (e.g., avoidance, denial, suppression). Consequently, this non-judgmental, accepting awareness of aversive experiences is thought to prevent automatic, maladaptive reactivity that sustains suffering and maladaptive behaviours (Davis et al., 2015).

Emerging empirical research on psychotherapy mechanisms supports the idea that acceptance is one of the mechanisms by which MBIs exert positive effects. In a study of depression symptoms, self-acceptance was the strongest mediator of dispositional mindfulness and mood in college students (Jimenez, Niles & Park, 2010); that is, mindfulness exerted positive effects on mood primarily through the mechanism of self-acceptance. Teper and Inzlicht (2013) found that the executive functioning of people who meditate is significantly correlated with emotion acceptance. This suggests that meditation enhances some executive functions, like self-regulation, through acceptance. Compared to other proposed mechanisms, including catastrophizing and self-efficacy, Day and Thorn (2016) determined that pain acceptance was the only significant mediator of reduced headache pain following MBCT; that is, pain acceptance proved to be the primary mechanism by which MBCT reduced headache pain.

There is evidence to suggest acceptance is beneficial for chronic illness populations. A study compared the physiological effects of evaluative emotional processing to an acceptance orientation during a stress-inducing writing task in a community sample (Low, Stanton & Bower, 2008). Results showed that in comparison to the control and evaluative condition, individuals in

the accepting condition displayed significantly faster heart rate recovery following the task. This speaks to the paradoxical effect of acceptance; accepting stress can reduce the body's stress response. Davis et al. (2015) found that in comparison to CBT and pain management treatments, a treatment based on mindful acceptance led to significantly less reactivity to stress and pain in rheumatoid arthritis. The authors emphasized that decreasing reactivity is important for preventing automatic responses to pain that are often maladaptive. Finally, a meta-analysis of mindfulness and acceptance-based interventions in chronic pain showed they produced small improvements in pain intensity (*standardized mean difference (SMD)* = .24,  $p < .01$ ) and moderate improvements in pain interference ( $SMD = .62, p < .01$ ) (Veehof, Trompetter, Bohlmeijer & Schreurs, 2016).

Acceptance has relevance to IBD given the high rates of avoidance coping in this population. IBD has been noted to be associated with avoidance of various activities, such as socializing, travel, eating, sexual activity, and medical procedures (Mikocka-Walus, Andrews & Brampton, n.d.). This population has been found to cope with stress by remaining passive, sleeping more, and withdrawing from others (Graff et al., 2009). It is also common for individuals to describe abstaining from social activities and travel when symptom management concerns arise (Hall et al., 2005; Kemp et al., 2012). These behaviours suggest some intolerance for distress, which could potentially be counteracted by accepting experiences as they are. This is not to say that people with IBD must accept potential negative outcomes of their disease, such as incontinence, with passivity and resignation, or without concern. In contrast, there is evidence that problem-solving strategies to avoid negative outcomes without compromising personally meaningful activities are very useful in IBD (e.g., prior to travelling, some individuals cope by locating washrooms, packing incontinence products, and bringing spare clothes) (Kemp et al.,

2012). Acceptance simply involves being open to experiences as they are, so that one can become more tolerant of stress, and attain a sense of clarity (Kabat-Zinn, 1990). For example, this might include accepting that travel with IBD is possible, but involves extra hassles. This clarity enables one to then act with intention rather than automaticity (e.g., planning to prevent incontinence versus being frustrated at barriers encountered during travel). Thus, an attitude of acceptance is not incompatible with a decision to enact change, and acceptance and change-based approaches need not be considered mutually exclusive. By promoting acceptance, MBIs might serve to decrease distress and to increase adaptive coping responses.

Indeed, studies show that acceptance has the potential to combat avoidance of difficult experiences. A study examined the effects of mindful acceptance during an aversive interoceptive stimulation task in anxiety-sensitive females (Eifert & Heffner, 2003). Compared to controls, the mindful acceptance group showed significantly less avoidance behaviour during the task. This is relevant to IBD, as acceptance interventions may also work to decrease avoidance behavior in this population. In chronic spinal pain, experiential avoidance and fear-avoidance behaviours were negatively correlated with pain acceptance (Ramirez-Maestre, Esteve & Lopez-Martinez, 2014). Such results are consistent with the fear-avoidance model of chronic musculoskeletal pain, which proposes that confrontation of pain is key to counteracting maladaptive avoidance behaviours (Leeuw et al., 2007). It is therefore possible that acceptance may also encourage a willingness to experience stress, pain, and other symptoms associated with IBD, thereby targeting avoidance behaviours often seen in this population. Indeed, although acceptance was not measured as a mediator, studies of ACT have shown reduced psychological distress in IBD, an intervention that teaches the cultivation of acceptance (Rowan et al., 2017; Wynne et al., 2019).

#### 4.2.2 Self-Compassion

Self-compassion has a basis in Eastern philosophy and is intertwined with mindfulness (Neff, 2003a); in fact, it is commonly proposed as a mechanism of mindfulness. Today it is the foundation of Compassionate Mind Training and Mindful Self-Compassion, which are forms of psychological interventions designed to combat shame and self-criticism (Gilbert & Proctor, 2006; Neff & Germer, 2013). These therapies are designed to activate the self-soothing system (Leaviss & Uttley, 2015), and include practices such as compassionate letter writing and imagery-based self-talk (Leaviss & Uttley, 2015). Neff (2003a) describes self-compassion as being touched by and allowing for one's own suffering, not avoiding it, and being willing to ease the suffering with kindness. She describes three processes within self-compassion: (1) self-kindness rather than self-criticism, (2) mindful awareness of suffering rather than over-identification, and (3) perceiving one's suffering as part of the larger human experience rather than as an isolating quality (Neff, 2003a). It is proposed that self-compassion facilitates a sense of self-acceptance in which one is neither running away *from* or running away *with* feelings, which consequently, facilitates resilience in the face of pain and suffering (Goldstein & Kornfield, 1987 in Neff, 2003a; Neff & Germer, 2013).

While self-compassion may seem to encourage a self-centered or narcissistic attitude, leading self-compassion theorists suggest that it has the opposite effect. Self-compassion simply involves perceiving one's own suffering (e.g., failure, challenges, imperfections, inadequacies) as part of the human experience and being non-judgmental of oneself (Neff, 2003a). Therefore, self-compassion does not involve "placing oneself on a pedestal"; rather, it cultivates an attitude of equality. Moreover, Neff states that a benefit of self-compassion is that less judgment of ourselves leads to less judgment of others (Neff, 2003a). She explains that with self-compassion



comes self-acceptance, and resultantly, comparisons of oneself to others are not needed to boost self-esteem (Neff, 2003a). When we feel deficient, there is often an inclination to judge others harshly for the purpose of easing such feelings of inadequacy (Neff, 2003a). However, when we are able to eliminate harsh self-criticism, this need to criticize others dissipates.

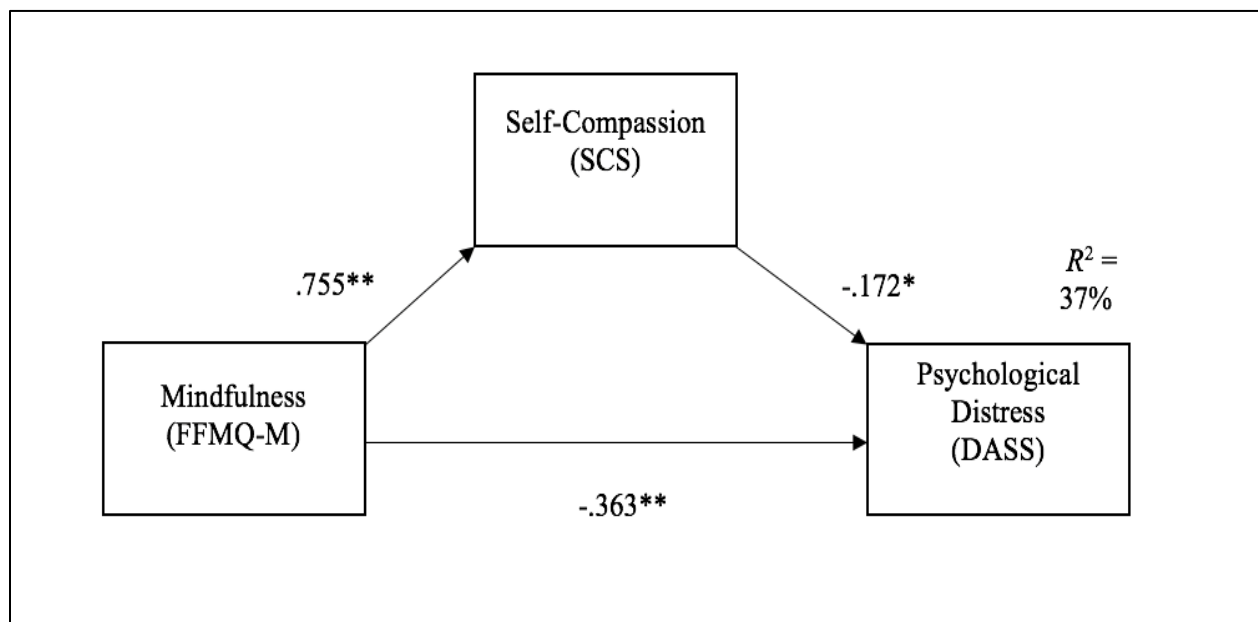
There is emerging empirical support for self-compassion as a mediator of mindfulness and psychological factors. Studies of MBSR and MBCT have been found to lead to positive outcomes through self-compassion. That is, changes in self-compassion were found to mediate (i.e., account for) reductions in worry and fear of emotion (Keng, Smoski, Robins, Ekblad & Brantley, 2012), as well as reductions in depressive symptoms (Kuyken et al., 2010). In a review of MBSR and MBCT, Gu and colleagues produced preliminary evidence for self-compassion as a mediator of improved psychological outcomes (Gu et al., 2015). In a group of people who meditate regularly, Baer, Lykins and Peters (2012) demonstrated that both mindfulness and self-compassion mediated the relationship between meditation experience and psychological well-being. Similarly, level of dispositional self-compassion partially mediated (i.e., accounted for) the relationship between dispositional mindfulness and psychological well-being among people without a regular meditation practice (Hollis-Walker & Colosimo, 2011).

Self-compassion may have particular importance in facilitating positive outcomes from mindfulness in IBD because of the consequences of living with this illness. Individuals with IBD often report feelings of shame in response to symptoms and stigma (Chang et al., 2006; Denters et al., 2013; Hall et al., 2005; Kemp et al., 2012), and self-compassion is a well-known antidote to shame (Brion, Leary & Drabkin, 2014; Gilbert, 2006; Leaviss & Uttley, 2015; Neff, 2003a), including illness-related shame (Brion et al., 2014). In the context of mindfulness and IBD, self-compassion may help individuals attend to painful experiences infused with shame, and

consequently facilitate therapeutic change. A pilot study with IBS demonstrated that levels of dispositional self-compassion mediated (i.e. accounted for) the negative relationship between dispositional mindfulness and stress (see Figure 4.1) (Potter, Hunter & Morrison, 2019). Given that there are some commonalities in IBS and IBD symptomology, and that individuals with IBS also report feelings of shame and embarrassment, self-compassion may be also be an important mediator of mindfulness in the context of IBD.

### 4.3 Conclusion

Research into mechanisms of change in MBIs continues to grow. Theoretical models have proposed a number of potential mechanisms, and systematic reviews of mediators of



*Figure 4.1* Statistical model: self-compassion as a significant mediator of trait mindfulness in IBS

Note: FFMQ-M: Five Facet Mindfulness Questionnaire, modified (excluding observing subscale).

\*\* indicates significance at the .01 level

\* indicates significance at the .05 level

Pathway from FFMQ-M to DASS reflects the direct effect

mindfulness have identified similarities and differences across psychological and physical conditions. Both leading theories and empirical studies have proposed acceptance and self-compassion as particularly relevant mechanisms for the effectiveness of MBI in chronic illness populations. Acceptance may enhance resilience and reduce illness avoidance behaviours, while self-compassion could ease illness-related shame. However, further study of other potential change mechanisms is also warranted, as the existing evidence base does suggest other possible mechanisms for the effectiveness of MBIs. There is also a need to further examine whether mechanisms of effectiveness vary across illness populations, including IBD.

### **Transition**

Chapter 4 provided an overview of mindfulness, explored the theoretical and empirical evidence for mechanisms of MBIs, and argued that acceptance and self-compassion may facilitate positive psychological outcomes in IBD, although further exploration of other potential mechanisms is warranted on the basis of research findings to date. To further understand the mechanisms by which mindfulness promotes positive outcomes in IBD, it was considered important to speak with people with IBD who are practicing mindfulness. In Chapter 5, Study 2 provides a valuable “inside look” at how a regular mindfulness practice is experienced and understood by individuals with IBD.

## **Chapter 5.**

### **Study 2: Mindfulness Meditation and Individuals' Experiences of Living with Inflammatory Bowel Disease: A Qualitative Analysis**

#### **5.1 Introduction**

One of the most profound effects of chronic illness is a disruption of the body-self complex. In new ways, the body seems to demand attention (Osborn & Smith, 2006), threaten health (Williams, 1996), and interfere with one's sense of self and identity (Charmaz, 1995). In accounts of individuals' experiences with chronic illness, this self-body disruption has been described through metaphor; specifically, bodies are experienced as a foreign being (Osborn & Smith, 2006), an enemy (Godbold, 2013), and an obstacle (Heggdal, 2013). The disruption of the body-self complex is evidently distressing, even shameful to some (Smith & Osborn, 2007).

Similar experiences of disruption are described in inflammatory bowel disease (IBD), a medical condition characterized by chronic inflammation of the digestive tract and co-occurring abdominal pain, diarrhea, fatigue, and other bodily complications. Individuals with this disease have described their illness as a foreign invader of their bodies that they must battle against (McGuigen-Scott, 2016). Perhaps this relates closely to the significant interference in daily functioning that results from symptoms of this disease, creating new obstacles to physical demands such as exercise and work attendance (Bernklev et al., 2006; DeFilippis et al., 2016), to social activities such as spending time with family and attending recreational events (Hall et al. 2005), and to effective emotion management (Sajadinejad et al., 2012). Shame is also a predominant experience, as people with IBD struggle to protect their private selves when symptoms present in public spheres (Thompson, 2013). Finally, in cases of stoma surgery, where the person receives an ostomy pouch for fecal waste, people with IBD must learn to live with

significant changes to their bodies, and must negotiate personal boundaries as they arise within the social realm (Manderson, 2005).

As a response to their sense of self-body disruption, some individuals with chronic illness make efforts to restore relations with their bodies. This restoration seems to be cultivated through acceptance of illness experiences (Charmaz, 1995), such as new limitations (Delmar et al., 2005). It is also cultivated through responding to the body as a partner, with awareness (McGuigan-Scott, 2016), trust (De los Santos Mycue, 2016), and gratitude (Clarke & Griffin, 2008). From this research, it is suspected that acceptance may relieve the tensions between the person and their body, and improve adjustment and coping in chronic illness.

Acceptance is also a hallmark of the mindfulness tradition. Mindfulness works to facilitate acceptance (Sauer & Baer, 2010) and present-moment awareness (Baer, Smith, Hopkins, Krietemeyer & Toney, 2006). Kabat-Zinn (2005) notes that a compassionate and curious attention to bodily experiences can facilitate appreciation for the body. Moreover, practices involving mindfulness, such as meditation and yoga, help people to develop a sense of trust in their bodies (Schure, Christopher & Christopher, 2008). Given that narratives of adaptation to chronic illness seem to involve precisely the qualities cultivated in the mindfulness tradition, I wondered whether mindfulness might have the potential to improve psychological well-being in IBD. No research has yet been undertaken to qualitatively explore the experiences of people with IBD who practice mindfulness. Therefore, the objective of the current study is to better understand these experiences.

## **5.2 Methods**

### **5.2.1 Ethics**

This study received approval from the Research Ethics Board at the University of Saskatchewan on July 16<sup>th</sup>, 2017.

### **5.2.2 Epistemology and Theory**

Qualitative and quantitative researchers often differ in their assumptions about the nature of knowledge and truth-finding (Haverkamp & Young, 2007). For example, traditional quantitative research adopts an objectivist philosophy, which posits knowledge exists in the external world and is to be discovered (Crotty, 1998). Among qualitative researchers, a number of approaches to knowledge, or epistemologies, are possible. These could include philosophical stances that view knowledge as co-created through social processes (i.e., constructivism) or knowledge as generated by aspects of the person (i.e., subjectivism) (Crotty, 1998). The adopted epistemology or theory is important, as this informs the research methods (Haverkamp & Young, 2007). For instance, an objectivist researcher would rely on controlled methods that ensure the researchers are not inadvertently influencing the knowledge or data that is to be discovered, whereas constructivist researchers would acknowledge their own role in the research process, particularly in the generation of data (Haverkamp & Young, 2007). A second reason the epistemology is important is that it sets the standards of quality for the research (McMullen, 2002). Keeping with the above comparison, an objectivist researcher would require reliable and stable data across time and context, whereas a constructivist who views knowledge as changing across time and context, would expect to see variability in the data (L. McMullen, personal communication, November 6, 2017). Therefore, the theory is crucial to the methodology.

**5.2.2.1 Epistemology: Constructivism** The epistemological stance of the researcher guides standards of research (L. McMullen, personal communication, September 11, 2017). The mode of understanding (McMullen, 2002) for the current project is a constructivist epistemology. The core foundational assumptions of constructivism are that (1) knowledge is constructed through everyday, iterative social interactions, and is therefore co-created among people, (2) labels and categories (e.g., gender, disability) are not real divisions, but rather, socially constructed processes, and (3) knowledge changes across contexts, including contexts of time and culture (Burr, 1995). Social constructivists believe that knowledge can be stable across individuals, yet it can also vary to some degree. For instance, in a phenomenological study on nurses' experiences with dying patients, the researchers assumed that unique experiences would emerge across participants but that these experiences would be built from a shared reality (Hopkinson, Hallett & Luker, 2005). This theoretical stance was based on the work of Spiegelberg (1971), and is fitting for the proposed study.

#### **5.2.2.2 Theory: Interpretive Phenomenology**

The current study adopts an interpretive phenomenological theoretical stance. Phenomenology seeks to understand human experiences of phenomena (Wertz, 2005). An assumption of phenomenology that is relevant to the current study is that while experience varies across individuals, at the same time, there can exist a shared reality of phenomena (Hopkinson et al., 2005; Spiegelberg, 1971). Thus, the goal of this study is to explore the unique experiences and shared reality of individuals mindfully living with IBD. A relevant assumption of interpretive phenomenology is that the researcher's preconceptions, knowledge, and beliefs are useful in the inquiry into phenomena (Lopez & Willis, 2004). In particular, the researcher's perspective is thought to fuse with that of the participants' in an effort to understand the

phenomena on a deeper level (Haverkamp & Young, 2007). This is consistent with constructivist theory, or the co-creation of knowledge between researcher and participant. In the current study, I will be acknowledging my own experiences and preconceptions of mindfully living with a chronic illness as I conduct the research process. This will serve two purposes: (1) to acknowledge that the knowledge, in this context, will not be “pure,” but rather, co-created, and (2) to ensure that the interpretations were constructed from participants’ data.

### **5.2.3 Participants**

After institutional research board approval was received, six adults from Canada and the United States were recruited using purposive sampling. Inclusion criteria were as follows: age 18+, a self-reported physician diagnosis of IBD, and a self-reported mindfulness practice (at least weekly). *Mindfulness* was defined as a practice of using an intentional and accepting quality of attention towards unfolding present-moment experiences of the body and/or mind. Participants were recruited with the help of Crohn’s and Colitis Canada (CCC) and online web-based support groups including Facebook and Reddit. Information on the study was shared in a CCC newsletter and posted to support group webpages.

Participants included four women and two men with IBD. Specific IBD diagnoses included Crohn’s disease, ulcerative colitis, and indeterminate colitis. Almost all of the group members had other diagnosed health conditions, which included hypogonadism, chronic fatigue syndrome, hypothyroidism, fibroids, enteropathic arthritis, avascular necrosis, irritable bowel syndrome, food allergies, depression, and post-traumatic stress disorder. Each of the participants engaged in at least one type of mindfulness practice either daily, or at minimum, three times a week. All had formal training in mindfulness (delivered by a meditation or yoga instructor, a



health care practitioner, or a mentor), and years of experience with mindfulness ranged from 1 to 28.

#### **5.2.4 Procedure and Interview**

I (first author) conducted a single telephone or video interview with each participant. I conducted each interview in a private research office, and I asked participants to choose a space and time that would maximize privacy. Interviews lasted 45 minutes to two hours, depending how much the interviewee had to say (Knox & Burkard, 2009).

Prior to each interview, I documented the informed oral consent of each participant. Participants provided their sociodemographic characteristics orally, which I recorded manually. These included a preferred pseudonym, gender, age, illness type, age of illness onset, type of mindfulness practice, and experience with mindfulness practice. The interview then proceeded.

Interviews were semi-structured, as recommended when there is sufficient literature on a topic (Brocki & Wearden, 2006), and were conversational, with flexible use of the interview guide, adequate open space for participants to speak freely about their experiences, and genuine curiosity about the perspectives of the interviewees (Hopkinson et al. 2005; Knox & Burkard, 2009). The interview guide, found in the Appendix, was influenced by prior research on the effects of chronic illness on self, body, and social relations, and a study about people's experience of stomas, which included some individuals with IBD (Smith, Spiers, Simpson & Nicholls, 2017). Interviews were digitally audio-recorded and transcribed.

#### **5.2.5 Analysis: Interpretive Phenomenology Analysis (IPA)**

Theoretically, IPA is rooted in both phenomenological and interpretivist philosophies (Smith, Flowers & Larkin, 2009). Phenomenology aims to understand ways of being-in-the-world through inquiring into individuals' holistic experiences (Wertz, 2005). An interpretivist or

hermeneutic approach aims to make sense of individuals' experience through interpretations (Lopez & Willis, 2004). Therefore, IPA seeks to explore individuals' lived experiences while also recognizing the role of the researcher in making sense of these experiences (Smith et al., 2009). IPA emerged from the social cognition paradigm (Smith, Jarman & Osborn, 1999), placing importance on social and cognitive processes. That is, IPA endorses connections among states of being, cognition, and verbal accounts of experience (Smith et al., 1999). According to Smith, Flowers, and Larkin (2009), IPA is characterized by three features: idiographic, inductive, and interrogative. The approach is idiographic in that individual cases are analyzed in detail before establishing generalizations. This feature is consistent with social constructionism and the view that knowledge can be stable yet vary across individuals. IPA is inductive, meaning that the researcher does not set out to disprove a hypothesis, but rather, remains open and flexible to whatever themes emerge from the data. Lastly, IPA is interrogative; it illuminates or interrogates the existing research in psychology to situate the study's findings within this context.

IPA is particularly well-suited for the current study for a number of reasons. First, phenomenology explores experience, which is assumed to illuminate the processes of mindfulness in the context of illness. Second, IPA places importance on cognition (i.e., meaning-making), and certainly, there are cognitive components to both mindfulness and IBD. For example, a cognitive component of mindfulness is attention, including awareness of thoughts and other experiences as they occur. Further, Smith, Jarman and Osborn (1999) argue that IPA is well-suited for health psychology studies because it places importance on the cognitive meaning-making processes through which individuals provide accounts of their experiences with their bodies. A final reason that IPA is fitting for this study is that it is typically done with a small number of participants to generate nuanced information on experience. Since the current study

has very selective inclusion criteria, the approach provides a good match to the likely sample size.

The approach of Smith and colleagues' guided the analytic process. I began analysis with the first participant's account with line-by-line reading, making note of significant and/or frequent descriptions, concepts, or language within the account. I then constructed experiential themes, and the interconnections among these themes noted. Following this, I generated labels for superordinate themes through the use of abstraction. The superordinate and sub themes were then ordered coherently into a master list or table. Next to each theme, an identifier indicated where in the transcript each instance can be found (i.e., page number, line, and key words). This was a crucial step in ensuring that the themes were reflected in the participants' experiences. Once this process was completed for a single case, I repeated this analysis, which resulted in a final master list of themes. The master list could be individualized by noting the themes in each individual's account.

Although the analysis that follows shares features of other qualitative analytic methods (e.g., thematic analysis), a distinguishing feature of the current study is that it is situated in a social constructionist epistemology and theoretically rooted in hermeneutics. This approach requires acknowledgement of my involvement in the research process, and my influence on the generation of interpretation of the data. For example, given the relational process of an interview, my position of power as researcher, as well as my interpersonal actions, inevitably affected participants' contributions. In addition, because certain experiences of the participants resonated with me at times, my emotional responses are likely to have influenced the direction of the interview and theme development. Perhaps most importantly, I had my own preconceptions about what it meant to practice mindfulness while living with a chronic digestive condition. For

instance, I believed that a chronic condition like IBD could greatly interfere with experiences ranging from interpersonal interactions to the experience of body and self, and that a regular practice of mindfulness meditation could change some of these experiences for the better. Such preconceptions played a role in the research design, interview process, and analysis.

### **5.2.6 Trustworthiness**

In qualitative research, two standards are especially relevant to the trustworthiness of qualitative work: *dependability* and *credibility* (Morrow, 2005). However, relevant standards are also dictated by the theoretical framework (in this case, interpretive phenomenology).

#### **5.2.6.1 Dependability**

*Dependability* is the expectation of consistency within the data; for instance, from one analyst to another. The expectation of inter-rater consistency is not completely congruent with an interpretive approach because each researcher is seen as bringing their own unique perspectives to the interpretation process (Brocki & Wearden, 2006). The concept of dependability is also not identified as a criterion in discussions of rigour in interpretive phenomenology (Brocki & Wearden, 2006; de Witt & Ploeg, 2006; Lopez & Willis, 2004; Smith, 2004). Therefore, dependability was not used to assess the quality of the research in the current study.

#### **5.2.6.2 Credibility**

*Credibility* refers to how well the data reflect the intended focus (Graneheim & Lundman, 2004). In this case, credibility was judged according to the intended focus of interpretive phenomenology, or how well the analyst's knowledge is infused by the perspectives of participants. The criterion presented by Haverkamp and Young (2007) is that the resulting knowledge should broaden understanding of the studied phenomena (e.g., in this case, to provide a fuller understanding of mindfully living with IBD). Reflexivity is one method used to enhance

the credibility of the study and is a key process in interpretivist approaches (Smith et al., 1999). Reflexivity refers to the researcher's continuous reflections on her or his own preconceptions, beliefs, and values, and how these come together in the generation of the study's findings (Jootun, McGhee & Marland, 2009). While some researchers believe that personal views should be separated as much as possible from the phenomenon under study (Jootun et al., 2009), the theoretical stance of this research posits that the researcher's conceptions are an inherent part of the researcher-participant dynamic (Brocki & Wearden, 2006; Lopez & Willis, 2004; Smith et al., 1999). During the analysis, credibility was facilitated by keeping a reflexivity journal, within which personal reflections, including preconceptions, questions, and discoveries, were documented during the research process. After the analyses, a credibility check was employed. This involved having a reviewer (the second author) (in this case, the research supervisor) survey the connections between the analyst's (first author's) process and interpretations (Cope, 2014). Reflexivity journal material directly informative to theme development was included in the review. The goal was to seek agreement that data was analyzed and interpreted credibly (i.e., in a way that took into account the researcher's and participants perspectives, and broadened knowledge of the topic), regardless of whether the reviewer would have interpreted the data in exactly the same way (Brocki & Wearden, 2006; Graneheim & Lundman, 2004).

The credibility check revealed a high degree of correspondence between the perspectives of each participant and the common themes identified in the analysis. However, some theme labels reflected the unique experiences of one or two participants, and were less common across the whole group, so were deleted. Further, some theme content surfaced at both the major theme and sub-theme level. Overall, re-engaging in the analytic process after the credibility check

resulted in some changes to the organization of themes across major- and sub-categories, some changes to theme names, and a reduction in the number of major themes.

### **5.3 Results**

I constructed five shared themes in the experiences of the six research participants who were mindfully living with IBD: *Aware and Seeing Fully*, *Nonjudgmental Experiential Engagement*, *Acceptance*, *Self-Regulation*, and *Resilience*. Table 5.1 displays evidence of the superordinate themes and their sub-themes across the group.

#### **5.3.1 Aware and Seeing Fully**

I saw each of the participants' accounts communicating a sense of enhanced awareness of various experiences. This major theme included three sub-themes: *awareness of thinking and emotions*; *awareness of body*; and *awareness outside the body*.

##### **5.3.1.1 Awareness of Thinking and Emotions**

Participants universally spoke to an improved awareness of their thoughts and emotions. Roland felt that he had experienced more mental clarity since beginning to live mindfully with IBD. In particular, he was now more aware of the onset of cognitive symptoms associated with illness, which he described as mental fatigue or "the fog". Participants also spoke to their awareness of unhelpful illness-related thoughts, which Danielle described as "the negatives, and what wasn't going well, and how [IBD] was the worst." Mindfulness also enhanced the emotional awareness of some participants. For instance, Allison said that mindfulness helped her "take the temperature" of her emotions and be "less surprised" when they surfaced. Participants' awareness encompassed a resilient attitude of nonjudgment and playfulness, and in many cases, facilitated adaptive coping responses or a "trouble shooting mindset," as Roland put it.

### 5.3.1.2 Awareness of Body

I perceived participants' descriptions of mindfully living with IBD as reflecting an enhanced body awareness, in that mindfulness allows them to feel more present in their whole body. For example, in contrast to other forms of meditation, mindfulness allowed Anna to feel "connected" rather than experiencing "a separation from [her] body." Participants also described being more fully aware of *both* positive and negative experiences in the body, as Allison stated:

You can um, change your awareness from being just so focused on whatever part of, for me my bowel was hurting, to realize that um, ya know, my whole right leg felt great, my toes felt great, my shoulders felt great, my neck felt great. And that ah, has I mean that has just been so wonderful, like a wonderful gift in my life... I am in pain, but it's a small part of my body that's in pain.

More generally, participants' comments suggested that an enhanced bodily awareness, or being "more aware of all the parts," as Revdoc put it, provides psychological relief from pain and feelings of wellness. Lastly, participants described an enhanced awareness involving the mind-body connection. For instance, for Rachel, digestive disturbances began to set off anxious and hypervigilant responses that her counselor described as post-traumatic stress. Cultivating a practice of mindfulness helped her bring a calm awareness to this experience:

[...] mindfulness also reconnects you with what's going on in your body and very aware, that I would say, it's not heightened my attunement because I've already been very aware of what's happening in my body or certain areas of my body, but I think it takes that awareness to a different level and helps you calm to see if it's a stress reaction versus a disease reaction.

Table 5.1

*Data supporting the finalized group superordinate themes and group sub-themes*

<b>Group Superordinate Theme</b> Group Sub-Theme	Roland	Anna	Revdoc	Rachel	Danielle	Allison
<b>Aware and Seeing Fully</b>						
Awareness of focus, thoughts, and emotions	P17/738-739	P18/799-807		P7-8/310-315	P2/65-69	P7/290-306
Awareness of body		P19/843-846	P12/520-530	P16/708-711	P12/502-503 & 513-516	P10/421-430
Awareness outside the body	P19/863-885	P2/62-64	P5&6/221-231	P4/140-145	P6/255-257	
<b>Nonjudgmental Experiential Engagement</b>						
Engaging closely and nonjudgmentally with difficult experiences	P7/351-352	P8/349-362	P13/548-561			P10/445-449
<b>Acceptance</b>						
Letting go and investing in the changeable	P23/1018-1021	P4/159-161	P9/368-373		P14/613-621	
<b>Self-Regulation</b>						
Perceived choice	P23/1013-1018		P9/377-378		P10/416-422	P15/665-676
Readiness to cope	P16/694-712	P10/451-454	P5/215-217		P4/158-161 & 167-169	P8/352-358



Attentional regulation	P7/310-315	P19/838-839	P17-18/768-778	P3/114-117	P8/347-351 & 354-360	P10/421-430
Emotional regulation	P20/872-882		P7/311-314	P7/264-301	P2/62-65	
<b>Resilience</b>						
Inner resource			P5/193-195	P18/778-785		P12/525-527
From deep funk to life resuscitation	P24/1059-1071	P14-15/618- 639			P4/164-166	P3-4/132-137

*Note.* Line numbers indicate the most representative instance of the theme in the transcripts for those participants who spoke to theme.

### **5.3.1.3 Awareness Outside the Body**

Participants' responses also suggested to me that a mindful awareness may open the person up to experiences outside themselves and their illness, and in addition, provide experiences that are pleasant and meaningful. For example, some participants described an enhanced awareness of their surroundings. Rachel, for instance, described a rich awareness of "the colors, or the scents, or the smells" that she could experience when using mindfulness in nature. Both Rachel and Danielle mentioned that this enhanced awareness of physical surroundings seemed to facilitate a greater appreciation of simple moments and joy. Further, Roland made special mention of an enhanced awareness of his social environment, noting that "[Mindfulness] does give me an awareness to other people in the conversation" and promotes "working in tandem, in cooperation with people." I saw an expanded awareness as helping participants shift from a constrained focus on self and illness to experiences beyond the latter.

### **5.3.2 Nonjudgmental Experiential Engagement**

Four of six participants depicted mindfulness as a nonjudgmental process of closely engaging with their experience. Rather than ignoring or fixating on difficult experiences, mindfulness seemed to allow participants to be close to their experiences but to respond in a nonjudgmental way. I saw this type of intimate and nonjudgmental engagement in Anna's experience of using mindfulness for pain:

[...] to actually sit with them [pain sensations] [...] to just dissect the symptoms into their discrete parts. So it's like, if, if you're having pain, that's sort of a larger symptom. But, what is the pain actually made of. Is it hot here, it is cold there, is it tingling there, is it, a ya know, a red line here, is it, sort of moving there. Ya know, what is the pain doing?

Anna's ability to "sit with" her pain and generate rich descriptors of it illustrated a capacity to 'stay close' to her experience, while her observations of her changing experience reflected nonjudgmental engagement. Similarly, Revdoc would "sit with" and "look at" vivid thoughts of an inflamed colon, thinking "Hmm, ok, that's what I'm dealing with." For Allison, cultivating the practice of a mindful body scan allowed her to be with her pain in a compassionate manner:

[...] and then when you do hit your bowel, you can say, 'Oh, I'm sorry that you're not feeling that well.'

I also perceived a close engagement with difficult experience when Roland stated, "I think a lot of people are afraid of pain, run from pain, um I've actually found more success running into it."

### **5.3.3 Acceptance**

I noticed a process of acceptance in four of six participants' accounts. Acceptance was seen to encompass three types of experiences: (1) recognizing what can and cannot be changed, (2) letting go of the unchangeable, and (3) investing in the changeable. The following quotation from Danielle delineates this process of acceptance:

I feel like I'm at such a good place in my life. Is my life perfect? By no means. I still have plenty of problems. But I don't dwell on those problems ... I've accepted it [IBD], and I'm ok with it, and ya know, realized this isn't gonna change.... even if I feel terrible, I feel so sick, ya know, my mind, at the end of the day, I can control that.

Here, Danielle recognizes what can and cannot be changed in her life. She realizes that she cannot change the fact that she has IBD, but she is responsible for her mindset. She implies a process of letting go ("I don't dwell on those problems") and moving forward by investing in what can be changed, which, from her perspective, is her psychological response to illness.

Roland expressed a similar sentiment, saying, "[Mindfulness] may not get rid of the depression,

it may not get rid of the brain fog, it may not get rid of some of the other, whatever symptom I'm currently having, but it definitely helps me to respond better," with "better" suggesting acceptance. Anna, too, made comments about recognizing and letting go of the unchangeable, and focusing on what can be changed, but for her, this was best achieved by letting go of physical limitations and cultivating a practice of her skills as an artist to the extent possible in her current health state. Overall, mindfulness seemed to have helped participants redirect their coping efforts away from efforts to change IBD symptoms, the negative impact of these symptoms, or depression, and toward a coping response of acceptance of such stressors.

#### **5.3.4 Self-Regulation**

I viewed each of the participants' accounts as emphasizing an improved ability to regulate responses to stress through mindfulness. This major theme contained four subthemes: *perceived choice, readiness to cope, attentional regulation, and emotional regulation.*

##### **5.3.4.1 Perceived Choice**

As participants spoke to their experiences, they emphasized the ways mindfulness provided a sense of choice in their responses to challenging situations. Danielle explained that soon after being introduced to mindfulness, she had "an epiphany." In particular, she described an experience of having the ability to choose thoughts: "[...] I decided that I'm just gonna choose this thought from now on, and I'm not gonna choose that thought." Roland also seemed to experience a sense of choice in relation to his mental and physical health challenges, as mindfulness allowed him to "respond better." In Roland's case, the word "better" suggests he was able to choose a new, more preferred response to such stressors, which as seen in the previous theme, was a response of acceptance. Allison used the metaphor of "space," conveying to me her experiences of making new choices as a result of her mindfulness practice. She

described how mindfulness had led her to a new and beneficial “space,” perhaps a new present-moment focus, that positioned her to choose different responses in the midst of depression, including taking steps to recover from an iPhone “addiction” and taking part in instrumental activities of daily living:

[...] it [mindfulness] would create space in my mind but I also feel like it would create space in my day, almost. Where, once I started doing [mindfulness], even after just a few sessions, I would be more um, able to do other stuff that benefited my depression, like, grocery shopping.

She also described having this “space” as renewing her “sense of purpose”. Overall, participants’ descriptions suggested that they were better able to act with intention, and were often choosing new responses as a result of their mindfulness practice.

#### ***5.3.4.2 Readiness to Cope***

Based on participants’ accounts of their experiences of mindfulness in relation to IBD, I understood that mindfulness often instilled a sense of readiness to cope. For example, Allison felt as though her regular morning practice of mindfulness was a warm sendoff for the day, allowing her to make a confident transition from home to work environments, ready to cope with any stressors she might encounter at work. In contrast, Danielle and Roland conveyed their “readiness” in the apparent immediacy of their coping responses. For instance, Danielle felt more ready to implement coping strategies the moment she started to feel stressed. Similarly, Roland was ready to problem-solve as soon as he notices the onset of illness symptoms. For each of these participants, feeling ready to cope and effectively deal with health-related issues seems to help them feel more capable of coping adequately. When speaking about dealing with IBD-

related stressors, Revdoc stated, “Sometimes I have ah, when I finish [meditating], I have a sense, ‘Ok, ya know, I can handle this, I’ll give it a shot, um I’ll try it, um I can do it.’”

#### ***5.3.4.3 Attentional Regulation***

All participants spoke of their improved ability to regulate attention. Both Rachel and Danielle described an enhanced present-moment focus, which for each of them, brought a sense of gratitude. As Rachel put it, “I find I take better appreciation of the activity I’m doing in that day, so, it almost makes like, a better memory.” Roland felt mindfulness “sharpened” his attention, lending to his ability to focus and think through problems. Anna described being better able to “come into [her] body,” suggesting greater control over re-directing her focus. Revdoc observed his own ability to let go of thoughts much more easily, feeling as though “nothing was demanding that [he] pay attention to it”. Universally, participants’ reports suggested that mindfulness improved their capacity for attentional focus and flexibility. For some participants, this was associated with gratitude and improved enjoyment or memorability.

#### ***5.3.4.4 Emotional Regulation***

Most participants reported an enhanced capacity for emotion regulation as a result of mindfulness practice. Participants’ descriptions of this capacity were rich in metaphor, conveying newfound abilities to halt, stop, or intervene in their emotional reactions. For instance, Danielle stated, “I’m able to catch [stress and anxiety] before I like, spin down that rabbit hole and um, and kind of stop myself, and put myself in a better state.” Revdoc stated that when he is mindful he does not, “carry on about [his] worry”, giving the sense that he is finally able to end a cycle of worrying that previously would have persisted. Similarly, Rachel refers to the impact of mindfulness on her experience of IBD by stating,

[...] it [mindfulness] stops making me jump at every time I think I have a symptom [...] it's that instant reaction [...] I sometimes jump to that conclusion of 'Oh no, I'm not feeling well, let's go up to here now, let's take the extra meds, let's do everything' when really, 'Let's be mindful, let's bring it down, and let's wait and see.'

I understood Rachel's "jumping" as an impulsive, catastrophic emotional response to her symptoms. In contrast, mindfulness seemed to level and slow this reaction ("let's bring it down"; "let's wait and see"). Together, these accounts suggested to me that mindfulness can help people with IBD regulate anxious thoughts, feelings of stress, and catastrophic appraisals of symptoms.

### **5.3.5 Resilience**

Participants described resilience as an *inner resource* experienced through mindfulness, and one that facilitated a transition *from "deep funk" to "life resuscitation"*; that is, from the depths of depression to a full re-engagement with life. Since narratives of resilience were closely associated with stories of self-regulation, I conceptualized resilience as an effect of self-regulation.

#### **5.3.5.1 Inner Resource**

Three participants, Rachel, Revdoc, and Allison, described how mindfulness helped them discover a previously unknown inner resource. Allison described this resource as a new source of inherent strength, likening it to a secret "superpower." Rachel echoed this by explaining,

I don't know if it's, like something that's always been there or if it's like that learned act that then my body has remembered so well, and goes, 'Ok, this is a really great coping mechanism, and we're gonna store it over here so you can always access it everyday.'

But either way, it feels like something very internal. And, like I have to go, and really

focus, and like unlock that room or whatever, and then it's there, and it's like, deep within me.

Revdoc emphasized the solace he found in this inner resource, stating, "...the biggest one is I have a place to go, instead of nowhere to go, um, when things don't go." Altogether, mindfulness appeared to grant participants reliable access to a source of strength and solace found within themselves, promoting their ability to cope with IBD symptoms and intersecting life stressors.

#### ***5.3.5.2 From "Deep Funk" to "Life Resuscitation"***

Resilience was particularly evident to me in participants' accounts of moving from the depths of depression to a full re-engagement with life. Allison described her introduction to mindfulness, through a weeks-long course, by saying, "...you can kind of get out of that deep funk, with the first half of the class... the first part I feel like is a little bit of a, life resuscitation or something." Other participants spoke to similar experiences of depression as they lived with chronic illness. Participants told stories of the way mindfulness helped them gradually re-connect with themselves and respond to their own needs. For example, through mindfulness, Roland was slowly able to attend to and gain insight into his own needs, and respond by seeking help for his mental health in the midst of depression:

It's interesting with like the depression, you can hear, when you start looking for it, you can hear the voice in the back of your head saying, 'This isn't right, you need to do something about this.' ... then I sit back and I think... 'I should go and discuss that with my doctor.

His renewed awareness of the extent of his own need, and action in response to this awareness (i.e., discussing with doctor), was the beginning of his own "life resuscitation." Anna described



her renewal in somewhat different terms, emphasizing the re-awakening and pursuit of her creativity:

The first time that I really suffered from depression was when I was diagnosed with colitis. Because I was so sick I wasn't making any art [...] Um, and I think I did start meditating again after that. And, I started making work in a very, like making creative work in a very small way, at first [...] I do think the meditation helped me create work again.

Overall, mindfulness seemed to re-establish participants' sense of agency, enabling them to re-engage with themselves and their lives following episodes of depression.

## **5.4 Discussion**

This study explored perceptions of the influence of a regular mindfulness meditation practice on the person, the body, and social experiences among people with IBD. The primary objective of the study was to examine whether and how mindfulness improves psychological well-being in IBD. Using IPA, five superordinate themes were constructed from the commonalities seen among the group: *Aware and Seeing Fully*, *Nonjudgmental Experiential Engagement*, *Acceptance*, *Self-Regulation*, and *Resilience*. These results suggest that mindfulness meditation can be associated with improved well-being in IBD, and also help to identify potential mechanisms by which well-being is improved. These results may have implications for treatment to promote well-being among people with IBD.

### **5.4.1 The Mechanisms by which Mindfulness Supports Well-Being**

Improved *awareness* was one mechanism by which mindfulness seemed to improve well-being in this sample. Awareness was characterized as broadened, and as having playful, calm, and objective qualities. These qualities of participants' awareness helped them recognize changes

in stress and health and respond adaptively. Improved insight as a result of mindfulness practice in IBD has also been documented experimentally in a Mindfulness-Based Cognitive Therapy trial (Schoultz, Macaden & Hubbard, 2016). However, a unique observation from the current study was that participants described having more positive experiences precisely because of an improved awareness of experiences that were unrelated to IBD symptomology (e.g., feelings of physical wellness despite pain, present-moment gratitude and enjoyment, social connection). It is possible that when using mindfulness-based interventions with an IBD population, promoting a mindful awareness of a range of physical, emotional, and social experiences could help to redirect attention to meaningful and rewarding experiences, thus optimizing outcomes.

Mindfulness also seemed to improve well-being by promoting *nonjudgmental experiential engagement*. Rather than avoiding or becoming preoccupied with difficult experiences like pain, participants were able to closely engage with such experiences by observing without judgment. This way of approaching their experience seems to illustrate Shapiro, Carlson, Astin and Freedman's (2006) concept of *reperceiving*: "disidentifying with contents of consciousness and perceiving one's present-moment experience with clarity and objectivity" (p. 377). A nonjudgmental engagement with experience has implications for promoting an adaptive relationship to pain and stress in IBD. For example, Shapiro et al. (2006) propose that *reperceiving* can create a form of exposure to difficult internal experiences that leads to desensitization. Thus, future research could explore whether a regular practice of mindfulness desensitizes people to unpleasant sensations through nonjudgmental experiential engagement.

*Acceptance* was an additional outcome of the mindfulness practice of the six participants. Rather than investing their efforts in changing IBD symptoms, the way these symptoms affected

their lives, or the emotional turbulence that sometimes accompanied their condition, participants recognized where they had limited control and when to let go. This outcome of mindfulness is likely to be particularly valuable to people with IBD, who identify a continuous struggle to decide which aspects of their illness are under their control (Kemp et al., 2012). Knowing when to let go and accept aspects of chronic illness may help people to integrate IBD into their sense of identity, restoring self-body relations and promoting illness adjustment (Charmaz, 1995). Acceptance did not equate to passive resignation; instead, mindfulness helped participants realize and invest in what they could control, and participants generally reported that what they could control was their response to their situation. A strikingly similar finding was reported in a qualitative study with individuals with long-term physical and psychological conditions (Long, Briggs, Long & Astin, 2016). The practice of mindfulness meditation helped individuals let go of illness-related concerns, and recognize their control in choosing how to respond.

*Self-regulation* also featured prominently in participants' descriptions of the changes they had experienced after practicing mindfulness. Theoretical accounts of mindfulness emphasize that self-regulation is one of the mechanisms by which mindfulness has effects on well-being (Malpass et al., 2012; Shapiro et al., 2006). Moreover, people with IBD identify self-regulation as a crucial component of their psychological well-being (Wolfe & Sirois, 2008). In this study, mindfulness supported participants' self-regulatory abilities by instilling a sense of intention, preparation, and flexibility in their responses to stressors. Such descriptions align with theories of mindfulness. According to theoretical accounts, mindfulness leads to increased present-moment awareness, which improves recognition of functioning and openness to novelty in experience. This, in turn, leads to an improved awareness of available response options (Chatzisarantis & Hagger, 2007). Further, nonjudgmental attention to and non-overidentification

with challenging experiences strengthens nonreactivity (Shapiro et al. 2006), promoting consideration and intention in responses, and more flexibility in choosing from available response options (Chatzisarantis & Hagger, 2007).

Lastly, participants' descriptions of mindfully living with IBD demonstrated their *resilience*. Resilience seemed to be a consequence of self-regulation, reflecting experiences of agency. Participants experienced their resilience as an inner resource, assuring them of their ability to find strength and safety within themselves when encountering adversity. It may be that in learning to regulate their responses to illness and stress, participants came to trust their own coping abilities to navigate and support them through the ongoing effects of illness. Indeed, previous research shows a relationship between self-regulation and self-efficacy in the context of high trait mindfulness (Luberto, Cotton, McLeish, Mingione & O'Bryan, 2014). Some of the participants in this study reported depression in association with IBD symptoms, and for them, mindfulness promoted re-engagement with life and resolution of depressed mood. This seems consistent with previous research showing that depression in IBD is associated with indicators of experiential avoidance (i.e., efforts to escape or avoid unpleasant internal experiences) (Trindade, Ferreira, Moura-Ramos & Pinto-Gouveia, 2017). Overall, participants' accounts mirror Charmaz's (1995) description of adjusting to chronic illness:

They believe in their inner strength as their bodies crumble [...] they experience setbacks, flare-ups, complications, and secondary conditions. Still they may discover that each part of their odyssey not only poses barriers, but also brings possibilities for resolution and renewal. (p. 675)

## 5.4.2 Comparison with Existing Theory and Research

Comparing findings to theory and research is an important step in theoretical development, the latter having important implications for both research and clinical practice. Qualitative research, in particular, offers a unique contribution to theoretical development through its inductive nature. That is, data were collected through participants' lived experiences rather than through predetermined constructs. Such methods provide important "insider knowledge" that can be used in the refining of theory. In considering the findings from the current study, there are areas of similarity with theory and research into mechanisms of mindfulness. At the same time, however, this research does show distinctions.

### 5.4.2.1 *The Shapiro Model of Mindfulness*

One well-known model of mindfulness is by Shapiro and colleagues (Shapiro et al., 2006). These authors propose a comprehensive model of core and sub-mechanisms of mindfulness that facilitate therapeutic change. Three components of mindfulness practice are thought to indirectly influence well-being: *intention* (reasons for practicing), *attention* (present-moment focus), and *attitude* (how one attends to the present-moment). The model comprises a meta-mechanism, *reperceiving*, describing a perspective shift that leads to a disidentification with one's contents of consciousness. As a result, four additional mechanisms are thought to emerge and create positive change in well-being: *self-regulation and self-control* (maintaining stability and adapting to change), a *clarification of values* (rediscovering and choosing values), *psychological flexibility* (freely chosen rather than habitual responses), and *exposure* (desensitization to aversive internal experiences).

There is evidence of some overlap of this model with the current study's findings. Participants' described a calm, objective, and playful quality of awareness, and responded with

acceptance. These experiences align with the attitude component of this model. Experiential engagement, or descriptions of living in relation to pain, closely resembled the model's meta-mechanism of re-perceiving (i.e., disidentifying with contents of consciousness). Finally, results overlap with the purported additional mechanisms, self-regulation and self-control, as well as psychological flexibility. The degree of similarity with Shapiro and colleagues' model suggests that this general theoretical model of mindfulness may well be applicable to people with IBD.

Differences between Shapiro and colleagues' model and the current findings were also evident. Their model includes other important concepts in understanding mindfulness that were not evident in this study, such as intention, values clarification, and exposure. Therefore, their model includes concepts of mindfulness that may not have been important to these participants with IBD. Moreover, their model emphasizes cognitive processes involved in mindfulness and positive change. The participants in this study highlighted mechanisms beyond cognition. For instance, participants spoke to becoming more aware of positive experiences, and emphasized an importance in discovering their own ability to cope with ongoing illness and the associated stressors. These effects of mindfulness may be uniquely important to chronic illness populations like those living with IBD. Indeed, Shapiro and colleagues propose a comprehensive model applied to mindfulness in the general population, whereas this study produced findings that are specific to a small, IBD sample.

#### ***5.4.2.2 Malpass' Meta-Ethnography of Mindfulness***

Malpass et al. (2012) conducted a meta-synthesis of qualitative inquiries into the experiences of MBSR and MBCT in various populations, two of the most prominent MBIs found in the literature. These authors propose that mindfulness produces positive effects by providing (1) insight, (2) inquiries into experience and perspective shifts, and (3) a transformation in

experience of self and illness. Similar to Shapiro and colleagues, Malpass et al. (2012) argue that mindfulness helps individuals gain insight into their maladaptive habits, develop new perceptions of objectivity and choice, and regulate their behaviour in an agentic and adaptive manner. This is thought to result in an experience of self as an observer, a concept akin to re-perceiving. Like Malpass and colleagues' model, the current study found that mindfulness helped individuals gain insight into themselves and respond more adaptively. For instance, participants were better able to realize the onset of stress and illness and take beneficial action, and further, gained insight into limits of control, promoting more accepting and adaptive responses. Malpass et al.'s shift towards an observing-self shares some overlap with the current study's theme of nonjudgmental experiential engagement. Participants were able to engage with pain in a relational and adaptive way. Finally, similar to the meta-synthesis, mindfulness supported participants by allowing them to regulate their behaviour in an agentic manner. Thus, the current study's findings map on nicely to the work of Malpass and colleagues.

One distinction is that participants in this study emphasized a significance in their experience of resiliency through self-regulation, which contrasts with the emphasis on a shift towards an observing self. Participants in this study found that the healing nature of mindfulness was in its ability to open them up to their own reliable source of strength amidst adversity. This finding maps onto research connecting mindfulness, self-regulation, and psychotherapeutic change (Wyatt, Harper & Weatherhead, 2014), and aligns with documented experiences of diminished agency in chronic illness (Tang & Anderson, 1999).

#### **5.4.3 Limitations**

While this research offers insights into mindfulness in IBD, there are some cautions to take in interpreting this research. As with most qualitative research, this study employs a small

sample size, and results are not assumed to be representative of all experiences of individuals with IBD and a mindfulness practice. Since this study employed IPA, larger sample sizes would have precluded an in-depth analysis of cases, thereby undermining the goal of documenting rich experiences (Smith et al., 2009). Nevertheless, other designs, such as cross-sectional and longitudinal surveys, could be used to explore whether study findings hold across a wider variety of individuals and contexts. Further, this study relied on participant self-reports of an IBD diagnosis and mindfulness practice. The unique characteristics of the required sample posed challenges in recruitment, rendering it necessary to rely on participants' self-reports of mindfulness practice rather than more objective criteria. Indeed, the interviews revealed that participants relied on different variations of mindfulness practice, ranging from yoga and tai chi to mindful breathing. Although all participants met the primary criterion for recruitment (i.e., their meditation practice aligned with the definition of mindfulness meditation used in this study), it remains unclear whether the range of meditation practices influenced the obtained results. Similarly, while mindfulness appeared to support individuals' well-being, this is a rather unique group of participants, each maintaining a regular, often daily practice of mindfulness. This study does not, therefore, speak well to the experiences of people who try mindfulness for a time, or who use it occasionally, or to the factors that enabled this group of people to sustain the practice.

## **5.5 Conclusion**

The current study explored the influence of mindfulness on six individuals' experiences of living with IBD. Through IPA, this study aimed to better understand how mindfulness may lead to positive change among people with IBD. Results suggest that mindfulness is associated with experiences of awareness, nonjudgmental experiential engagement, acceptance, self-



regulation, and ultimately, resilience. Further, these results overlap with literature on the mechanistic processes of mindfulness, but also offer insight into how mindfulness may produce change in IBD. Specifically, mindfulness provided individuals with a reliable coping resource, as well as feelings of wellness and agency despite chronic illness. Future research on mechanisms of mindfulness could explore the experiences identified in this study, especially if working with an IBD population.

### **Transition**

Chapter 5 provides valuable insight into potential change processes of MBIs in IBD. Many of the themes from this qualitative research conducted with a unique population align well with prior research on the mechanisms of MBIs in other populations, including suggestions that acceptance, nonjudgment, and self-regulation are important mechanisms. This research provides direction for further research exploring the mechanisms of MBIs in IBD. The next chapter continues to explore mechanisms of change in IBD using a quantitative approach. Chapter 6 argues that additional research should examine psychotherapeutic mechanisms specific to people experiencing physical illness. Study 3, presented in Chapter 6, relies on a cross-sectional survey design to study whether self-compassion, self-regulation, and perceived symptom interference statistically mediate the relationship between trait mindfulness and psychological well-being in IBD. In Chapter 6, symptom interference is introduced as an additional possible mediator based on findings from similar research with people who have another chronic bowel condition, Irritable Bowel Syndrome (Potter et al., 2019).

## **Chapter 6.**

### **Study 3: Examining Trait Mindfulness and Psychological Factors in Inflammatory Bowel Disease**

#### **6.1 Introduction**

As evidence of the therapeutic effects of mindfulness continues to grow, attention is shifting towards understanding the mechanisms of change in mindfulness-based interventions (MBIs) (Alsubaie et al., 2017; Creswell & Lindsay, 2014; Gu et al., 2015; Labelle, Campbell & Carlson, 2010; Shapiro, Carlson, Astin & Freedman, 2006; Visted, Vollestad, Nielson & Nielson, 2014). Mechanisms are processes that lead to change (Kazdin, 2007) and can consist of either *mediators* – described as variables that account for change between two variables – or *moderators* – variables that influence the strength or direction of a relationship between two variables (Kazdin, 2007). Understanding how mindfulness produces change is important for optimizing treatment success and determining appropriate interventions for individuals with IBD.

There is a particular need for more research into the mechanisms of mindfulness in individuals with physical health conditions (Alsubaie et al., 2017). Indeed, while models of the mechanisms by which mindfulness exerts effects on well-being are emerging in community and psychiatric populations (Sauer & Baer, 2010; Gu et al., 2015; Keng et al., 2012; Kuyken et al., 2010; Shapiro et al., 2006), there is a lack of research into such models for chronic illness populations (Alsubaire et al., 2017; Creswell & Lindsay, 2014), particularly inflammatory bowel disease (IBD). This is surprising given that Kabat-Zinn’s mindfulness-based stress reduction (MBSR) program was designed specifically for coping with chronic illness (Kabat-Zinn, 1990).

In the context of physical illness, researchers are encouraged to explore *disease-specific mechanisms of change* (i.e., mechanisms specific to the physical or psychological condition) and those that are *universal* (i.e., mechanisms shared across psychological and physical conditions) (Alsubaire et al., 2017). Alsubaire and colleagues' recent work emphasizes that there is some debate around whether mechanisms of mindfulness are similar or different across disorders. Some researchers propose that mindfulness mechanisms such as attention, acceptance, and exposure lead to positive outcomes across different physical conditions (Carlson, 2012), while others suggest mechanisms may be unique to certain conditions. For instance, some have proposed that self-awareness and attentional monitoring are potential change mechanisms of MBIs in cardiovascular disorders, and they help manage disease-relevant risk factors, like stress, exercise, and cravings (Loucks et al., 2015). These emerging questions around universal and disease-specific mechanisms take into consideration the unique vulnerabilities seen within psychological and physical disorders.

Following the direction of this research, Potter, Hunter, and Morrison (2019) explored disease-specific variables in the study of trait mindfulness in irritable bowel syndrome (IBS). Using a cross-sectional design and tests of statistical mediation and moderation, the authors assessed whether self-compassion and IBS symptom interference related to effects of trait mindfulness. Self-compassion and symptom interference were chosen as disease-specific variables to test, as research demonstrates their relevance to this population (i.e., symptom reactivity, along with shame and negative thought patterns, are commonly seen in IBS). Two single mediation models were tested, and showed that symptom interference and self-compassion each significantly mediated the relationship between trait mindfulness and psychological distress. In addition, trait mindfulness significantly moderated the relationship between IBS

symptom frequency and interference. This research supports further exploration of disease-specific mechanisms, including self-compassion and symptom interference, in the context of mindfulness for chronic bowel conditions.

### **6.1.1 Disease-Specific Mediators in IBD**

Self-compassion is described as being touched by and allowing for one's own suffering, not avoiding it, and being willing to ease the suffering with kindness (Neff, 2003a). Three processes are thought to constitute self-compassion: (1) self-kindness rather than self-criticism, (2) mindful awareness of suffering rather than over-identification, and (3) perceiving one's suffering as part of the larger human experience rather than as an isolating quality (Neff, 2003a). In IBD, self-compassion may support psychological well-being, as it has been found to reduce illness-related shame (Brion et al., 2014), and shame is a common experience in the IBD population. For instance, some individuals with this illness struggle to navigate social situations while living with socially censored symptoms, an experience described as painfully shameful (Thompson, 2013). Moreover, self-compassion may support well-being in IBD by easing the effects of illness-related challenges. For instance, chronic illness is associated with social role disruption and job loss, which can be painful experiences characterized by guilt, failure, and threats to self-worth. Self-compassion is known to ease this quality of suffering (Neff, 2003a) by targeting negative thought patterns like self-criticism (Neff & Germer 2013) and worry and rumination (Raes 2010). Thus, self-compassion may act as a protective factor in the mental health of those with IBD.

Theoretical models consider self-compassion to be a fundamental component of mindfulness. Shapiro, Carlson, Astin and Freedman (2006) propose that mindfulness involves a compassionate nonjudgmental attention, which promotes acceptance of difficult experiences. An

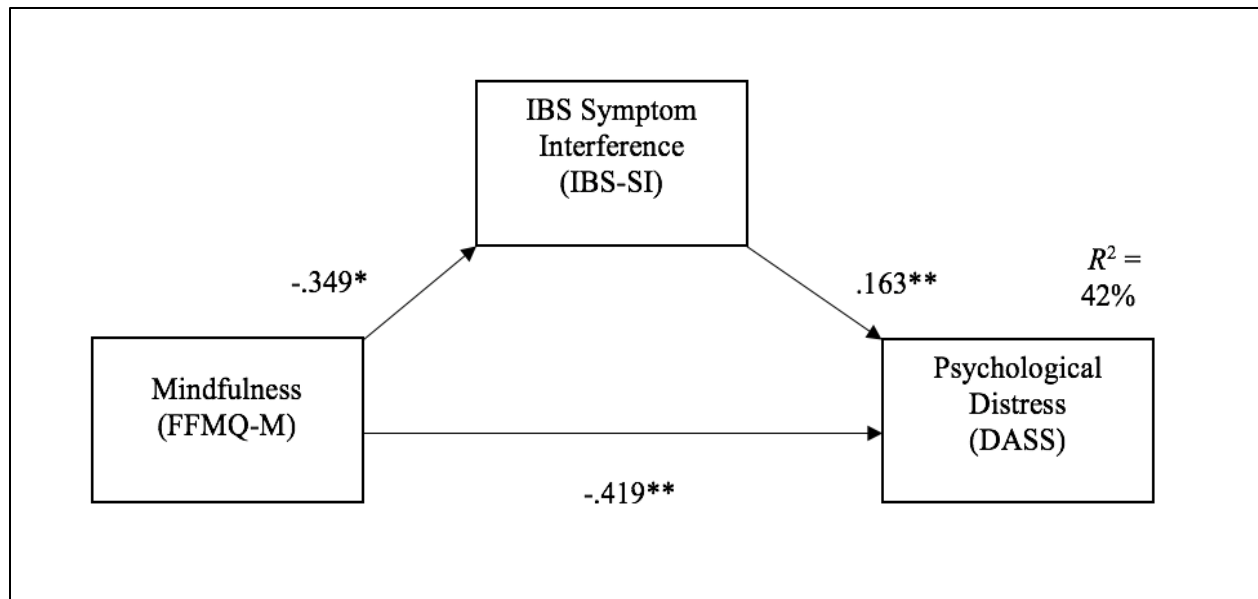
association between mindfulness, self-compassion, and well-being is corroborated by recent research. In the qualitative study conducted with people with IBD who also use mindfulness meditation, participants said that mindfulness led to a more compassionate response to self, and to a “paining” bowel that seemed to call for attention. In a cross-sectional study completed with people who have IBS, self-compassion mediated the relationship between trait mindfulness and psychological distress in IBS (Potter et al., 2019). In experimental studies, participants in MBSR or mindfulness-based cognitive therapy (MBCT) programs show decreased psychological symptoms, including worry, fear of emotion, and depression, alongside increased self-compassion (Gu et al., 2015; Keng et al., 2012; Kuyken et al., 2010). These findings suggest that self-compassion might statistically mediate, or partly explain, the relationship between trait mindfulness and psychological distress in IBD.

Symptom interference has been identified as a potentially important variable in understanding mindfulness and distress in chronic bowel conditions (Potter et al., 2019). Symptom interference is described as a subjective appraisal of symptoms as distressing, bothersome, and interfering in various domains of functioning. In IBD, symptoms include abdominal pain, diarrhea, incontinence, fatigue, joint pain, appetite loss, weight loss, and malnutrition (Irvine, 1999), which can lead to various forms of interference with functioning. For instance, individuals’ accounts of living with IBD suggest symptoms can interfere by leading to social isolation (Kemp et al., 2012), a struggle to regain control over the body (McGuigen-Scott, 2016), and limitations to physical activity (DeFilippis et al., 2016). These forms of symptom interference can be detrimental to psychological well-being in IBD. Some researchers have noted that interference of IBD symptoms on emotional functioning (i.e., feelings of unpredictability and loss of control) can contribute to anxiety and depression (Sajadinejad et al., 2012). Indeed,

participants in a qualitative study on the burden of IBD symptoms spoke of poor psychological outcomes resulting from symptom burden (Devlen et al., 2014).

Theoretically, mindfulness is thought to reduce perceptions of symptom interference in chronic psychological and physical conditions. MBIs, such as Mindfulness Based Stress Reduction (MBSR) and Acceptance and Commitment Therapy (ACT), aim to help the person become less affected by symptoms and more accepting of such experience (Kabat-Zinn, 1990). For instance, MBSR is thought to reduce pain interference by “uncoupling” the sensory experience from judgmental and affective reactions (Kabat-Zinn, 1982), thereby desensitizing the person to the aversive stimuli (Shapiro et al., 2006), and allowing them to experience unpleasant sensation without the “sounds” of emotional alarm bells (Kabat-Zinn, 1982). Similarly, mindfulness in ACT is thought to reduce symptom interference by helping the person become less psychologically reactive and more flexible in their ability to choose and engage in value-based behaviours (Hayes, Strosahl & Wilson, 2012). MBIs have been shown to reduce symptom interference in a range of medical conditions (Eyles et al., 2015; Garland et al. 2012; Garland et al., 2014; Tillisch et al., 2016), including chronic bowel conditions like IBS (Garland et al., 2012; Potter, Hunter & Morrison, 2019; Tillisch et al., 2016) (see Figure 6.1). Therefore, there is reason to believe that perceived symptom interference might partly explain the relationship between trait mindfulness and psychological distress in IBD.

Self-regulation may be another important construct to consider in the study of mindfulness and psychological well-being in IBD. Self-regulation has been described as the ability to exercise control over one’s thoughts, feelings, motivations, and actions (Bandura, 1991), and IBD patients have identified this as important to their quality of life (Wolfe & Sirois, 2008). Self-regulation can promote new, more adaptive responses to challenging situations



*Figure 6.1.* Statistical model: symptom interference as a significant mediator of trait mindfulness in IBS. FFMQ-M: Five Facet Mindfulness Questionnaire, modified (excluding Observing subscale); IBS-SI: IBS Symptom Interference; DASS: Depression Anxiety Stress Scale-21.

(Chatzisarantis & Hagger, 2007). In IBD, such self-regulatory abilities may help individuals better respond to themselves, their body, and illness-related interference.

Outside the context of IBD, mindfulness has been linked to various self-regulatory abilities, including attentional regulation (Chambers, Lo & Allen, 2008), emotional regulation (Kadziolka, 2018), and behavioural regulation (Lykins & Baer, 2009). The practice of present-moment focus emphasized in mindfulness meditation is thought to support an intentional, flexible, and ultimately, self-regulatory response style (Chatzisarantis & Hagger, 2007). Self-regulation has also been identified as a mechanism of therapeutic change in theoretical accounts of mindfulness (Malpass et al., 2012; Shapiro et al., 2006). Such theories are beginning to gain empirical support across various populations (Carmody et al., 2009; Short, Mazmanian, Oinonen & Mushquash, 2016).

Currently, there is very little study of the importance of self-regulation in IBD. However,

in Study 2, a regular practice of mindfulness meditation was found to support attentional and emotional regulation, and to cultivate a sense of choice and readiness to cope when encountering illness-related challenges. For example, participants stated that practicing mindfulness allowed them to choose more adaptive responses to illness rather than responding automatically. Examples of adaptive responses included engaging in daily activity despite depression (a common correlate of IBD) and responding calmly rather than anxiously to digestive upset. Participants perceived their increased self-regulatory capacities as contributing to their resilience to illness. Given that theoretical accounts of the mechanisms of mindfulness underscore the potential significance of self-regulation, and given that people with IBD who practice meditation have articulated the significance of this capacity in qualitative research, it is possible that self-regulation statistically mediates the relationship between trait mindfulness and psychological distress in IBD.

### **6.1.2 The Moderating Effects of Mindfulness**

Given that MBIs were originally used to promote acceptance of long-standing symptoms, the effect of mindfulness on perceived symptom interference is becoming an important topic of investigation. Veehof, Trompetter, Bohlmeijer and Schreurs (2016) found results that suggest mindfulness and acceptance-based interventions for chronic pain may moderate the relationship between pain intensity and perceived pain interference. That is, compared to small effect sizes on pain intensity, MBIs showed large effect sizes on pain interference, suggesting mindfulness supported day-to-day living despite pain. In addition, trait mindfulness is associated with lower perceived symptom interference from cancer-related fatigue (Johns et al., 2015), and with lower perceived symptom interference during menopause (Brown, Bryant, Brown, Bei & Judd, 2014). Further, Potter et al. (2019) found that trait mindfulness statistically moderated (weakened) the



association between IBS symptom frequency and perceived symptom interference by nearly half (see Table C.1). It is therefore anticipated that trait mindfulness might also statistically moderate (weaken) the relationship between symptom frequency and perceived symptom interference in IBD.

### **6.1.3 Current Study**

The purpose of this study was to investigate mechanisms that explain the relationship between trait mindfulness and psychological distress in IBD; that is, variables that statistically mediate and moderate this relationship. Three mechanisms identified for study were self-compassion, perceived symptom interference, and self-regulation. Two primary hypotheses were tested:

**Hypothesis 1:** Psychological variables, including (a) self-compassion, (b) perceived symptom interference, and (c) self-regulation, statistically mediate the relationship between trait mindfulness and psychological wellbeing in IBD.

**Hypothesis 2:** Trait mindfulness statistically moderates (i.e., weakens) the relationship between IBD symptom frequency and perceived symptom interference.

## **6.3 Methods**

### **6.3.1 Participant Recruitment**

There were two participation criteria: (1) age  $\geq 18$ ; (2) a physician diagnosis of IBD (based on self-report). Participants were recruited through the Crohn's and Colitis Foundation of Canada's social media posts (e.g., Twitter) and website, as well as through online IBD support groups on the platforms Facebook and Reddit.

### **6.3.2 Procedure**

The study relied on a cross-sectional design. Data collection involved a one-time web-based survey housed by the *Survey Monkey* platform. Participants began by completing a consent page, and subsequently, each of the measures in the study.

### **6.3.3 Measures**

Measures of sociodemographic and disease characteristics, IBD symptom interference, trait mindfulness, self-regulation, self-compassion, and psychological distress were administered (see Appendix B for measures).

#### ***6.3.3.1 Demographics***

General demographic information was collected to describe the sample. Sociodemographic information included gender, age, ethnicity, country of origin, and experience with mindfulness meditation. Disease characteristics included specific diagnosis (i.e., Crohn's disease, ulcerative colitis, or other form of IBD), disease activity, IBD-related health complications, disability leave, and the presence of other diagnosed physical and/or psychological conditions. Experience with mindfulness meditation was also collected.

#### ***6.3.3.2 IBD Symptoms***

IBD symptoms were measured by adding participants' scores on measures of symptom frequency and intensity. Each participant's symptom frequency was assessed using a previously published self-report method that determines the disease activity (Graff et al., 2006; Lix et al., 2008). Participants responded to the following questions: In the past six months, my disease has been: (a) Constantly active, giving me symptoms every day; (b) Often active, giving me symptoms most days; (c) Sometimes active, giving me symptoms on some days (for instance 1–2

days/week); (d) Occasionally active, giving me symptoms 1–2 days/month; (c) Rarely active, giving me symptoms on a few days in the past six months; and (f) I was well in the past 6 months, what I consider a remission or absence of symptoms (Graff et al., 2006). Scores are determined using a six-point Likert-type scale, with higher scores indicating greater disease activity (Graff et al., 2006). There is support for the convergent validity of this measure using other standardized clinical measures of IBD disease activity (Graff et al., 2006; Lix et al., 2008). Graff et al. (2006) used an additional measure to assess symptom severity. On this measure, participants rate the severity of three primary IBD symptoms: abdominal pain, diarrhea, and blood in the stool. Each symptom is rated over the previous 6 months on a Likert scale of 0–4. In the current sample, responses were positively skewed on the measure of IBD symptoms.

#### **6.3.3.3 Trait Mindfulness**

The Five Facet Mindfulness Questionnaire (FFMQ) is a 39-item self-report measure assessing trait mindfulness (Baer et al., 2006). The scale consists of five sub-scales: observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. Responses are indicated on a five-point Likert-type scale ranging from “never or very rarely true” to “very often or always true.” Higher scores indicate more mindfulness. There is support for the scale’s reliability and construct validity in both non-clinical and clinical samples (Baer, 2008; Bohlmeijer, ten Klooster, Fledderus, Veehof & Baer, 2011; Williams, Dalgleish, Karl & Kuyken, 2014). However, there is evidence that when the scale is used with non-meditators, the observing sub-scale can function in an unintended way and is therefore best excluded to derive a four-factor rather than five-factor structure (Baer et al., 2008; Baer, 2016; Gu et al., 2017; Williams et al., 2014). In a sample of individuals with IBS, the observing subscale inversely correlated with two of the four FFMQ sub-scales and positively correlated

with psychological stress (Potter, et al., 2019). However, once this scale was excluded, a modified four-subscale version of the FFMQ showed adequate inter-item reliability ( $\alpha = .89$ ). Convergent validity was established through a positive correlation with self-compassion ( $r = .71$ ,  $p < .01$ ) and an inverse correlation with stress ( $r = -.58$ ,  $p < .01$ ). In the current sample, the modified scale showed excellent internal consistency ( $\alpha = .91$ ), and responses were normally distributed.

#### **6.3.3.4 Self-Compassion**

Self-compassion was measured using the Self-Compassion Scale (SCS) (Neff, 2003b). This scale is a 26-item self-report measure assessing the extent one acts with self-compassion during difficult experiences. The scale consists of three sub-scales: self-kindness, mindfulness, and common humanity. Responses are indicated on a five-point Likert-type scale ranging from “almost never” to “almost always.” Higher scores indicate more self-compassion. There is good evidence of the scale’s reliability (inter-item and test-retest) and validity (convergent and divergent) in samples of undergraduate students, Buddhist meditation practitioners, therapists, and mental health outpatients (Neff, 2003b; MacBeth & Gumley, 2012). In a sample of individuals with IBS, the scale demonstrated excellent inter-item reliability ( $\alpha = .92$ ). Correlations with trait mindfulness provided support for its convergent validity ( $r = .71$ ,  $p < .01$ ), and inverse correlations with psychological stress provided support for divergent validity ( $r = -.51$ ,  $p < .01$ ). In the current sample, this measure demonstrated excellent internal consistency ( $\alpha = .95$ ) and responses were normally distributed.

#### **6.3.3.5 IBD Symptom Interference**

Interference of IBD symptoms was assessed using a modified version of the Hot Flush Related Daily Interference Scale. The Hot Flush Related Daily Interference Scale (Carpenter,

2001) is a 10-item self-report measure assessing the degree to which hot flushes are perceived as interfering with nine daily activities: work, socializing, leisure activities, sleep, mood, concentration, relaxation, sex, enjoyment of life, and quality of life. Responses are indicated on a 10-point Likert scale, ranging from “0” (did not interfere) to “10” (completely interfere). This measure has demonstrated excellent inter-item reliability in menopausal women (Brown et al., 2014) and inter-item reliability, construct validity, and convergent validity within a sample of women with and without breast cancer (Carpenter, 2001). The measure has also previously been adapted to other populations, including men with prostate cancer (Ulloa, Salup, Patterson & Jacobsen, 2009), although additional evidence of its validity in men is needed. This scale was modified, with permission, to assess perceived interference of IBD symptoms in psychosocial functioning. The modification involved changing “hot flushes” to “IBD symptoms.” In both the original measure and the modification, higher scores indicate greater interference. A modified version for an IBS sample showed sound psychometric properties (Potter et al., 2019).

#### ***6.3.3.6 Self-Regulation***

The Self-Control Self-Management Scale (SCSM) is a 16-item self-report measure of self-regulation (Mezo, 2009). The scale consists of three subscales: self-monitoring (monitoring of thoughts, emotions, and behaviours), self-evaluation (comparing thoughts, emotions, and behaviours to internal standards or values), and self-reinforcement (rewarding oneself when achieving goals). Responses are indicated on a six-point Likert scale, ranging from zero “very undescriptive of me” to five “very descriptive of me.” This scale has shown good internal consistency (.90) (Short et al., 2016) and there is support for its construct validity on both convergent and divergent measures in a sample of 410 Canadian university students (Mezo &

Short, 2012). In the current sample, this measure demonstrated excellent internal consistency ( $\alpha=.89$ ) and responses were normally distributed.

#### **6.3.3.7 Psychological Distress**

The Depression Anxiety Stress Scale-21 (DASS-21) is a 21-item self-report scale used to measure psychological distress (Lovibond & Lovibond, 1995). The depression sub-scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia. The anxiety sub-scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress sub-scale is sensitive to levels of chronic non-specific arousal. Scores are rated on a Likert-type scale with response options ranging from “0” (did not apply to me at all) to “3” (applied to me very much, or most of the time). Higher scores indicate higher psychological distress. The DASS-21 shows good reliability and validity in both non-clinical and clinical samples (Henry & Crawford, 2005; Page, Hooke & Morrison, 2007). Internal consistency measures ranged from .92 to .86 in clinical samples (Page et al., 2007), and .82 to .90 in community samples (Henry & Crawford, 2005). There are presently no available data for IBD samples. In an IBS sample, inter-item reliability was good for the total scale ( $\alpha = .94$ ). Convergent validity was supported by a positive correlation with symptom interference ( $r = .44, p < .01$ ), and divergent validity was supported by inverse correlations with trait mindfulness ( $r = -.58, p < .01$ ) and self-compassion ( $r = -.51, p < .01$ ). In the current sample, this measure exhibited excellent inter-item consistency ( $\alpha=.93$ ). Responses were positively skewed.

### **6.3.4 Statistical Analysis**

#### **6.3.4.1 Preliminary Analyses**

Data was analyzed using IBM SPSS Statistics software, version 26, and an add-on program, PROCESS (Hayes, 2013). Prior to analyses, diagnostics were conducted using a variety of statistical tests (i.e., Little's MCAR, Mahalanobis Distance, tests of normality, Cronbach's alpha, and tests of regression assumptions) in order to prepare the data for moderation and mediation analyses using regression. Given that some literature has found men and women to differ in the degree to which gastrointestinal disorders cause interference (Bjorkman et al., 2012; Chang et al., 2006; Maunder et al., 1999), an independent samples t-test was also conducted to test for sex differences on each of the measures in this study. The purpose of the latter was to determine whether analyses should be conducted separately for men and women. Bivariate correlations were also used to test correlations between variables.

#### **6.3.4.2 Mediation**

Mediation tests for the indirect effect of a variable, X, on an outcome variable, Y, through a third variable, M (the mediating variable). In the case that more than one mediator is hypothesized, as in the current study (M<sub>1</sub>, M<sub>2</sub>, and M<sub>3</sub>), multiple mediation is recommended (Preacher & Hayes, 2008). Therefore, the following mediation model was tested using PROCESS: self-compassion (M<sub>1</sub>), perceived symptom interference (M<sub>2</sub>), and self-regulation (M<sub>3</sub>) as mediators of the relationship between trait mindfulness (X) and psychological distress (Y).

Tests of multiple parallel mediation examine whether a set of variables simultaneously mediates the effect of X on Y, producing a *total indirect effect* (Hayes, 2013). These tests also provide researchers with the *specific indirect effect* of each mediator in the context of the other

mediators (Hayes, 2013). This approach is recommended over testing single mediation models, as it provides the relative magnitude of each individual mediator (Preacher & Hayes, 2008). A measure of the relative magnitude of mediators has important implications for furthering understanding of mediational processes of X and Y; in this case, mindfulness and psychological distress. Therefore, interpretation of the specific indirect effects is emphasized over an interpretation of the total indirect effect.

#### **6.3.4.3 Moderation**

PROCESS was also used to test for moderation effects. Tests of statistical moderation assess whether a variable, M (the moderating variable), influences the strength or direction of a relationship between two other variables, X and Y (Hayes, 2013). PROCESS uses linear regression and path analysis to assess the interaction of X and M in relation to the outcome Y (Hayes, 2013). The following model was tested: trait mindfulness (M) as a moderator of the relationship between IBD symptom severity (measured as the combination of symptom frequency and intensity) (X) and perceived IBD symptom interference (Y).

### **6.4 Results**

#### **6.4.1 Descriptives**

A total of 195 people comprised the sample (77.9% identified as women, 20.5% identified as men, and 1.5% identified as non-binary). Ages ranged from 17 to 72, with a mean age of 36.70 ( $s = 12.46$ ). The majority of the sample was of European descent (88.7%). Countries or regions of origin included Canada, United States, United Kingdom, Denmark, Sweden, Poland, The Netherlands, Italy, Greece, Slovakia, Saudi Arabia, Bahrain, South Africa, and India. Crohn's disease was the most common IBD diagnosis (65.1%), followed by ulcerative colitis (30.3%), and lastly, indeterminate IBD (4.1%). Duration of the IBD diagnosis ranged



from less than a year to 45 years. A total of 60.0% of the sample reported having a diagnosed medical condition comorbid with IBD. For 33.8% of the total sample, irritable bowel syndrome (IBS) was an additional diagnosis. In addition, 31.3% of participants were diagnosed with a mental health condition; primarily, anxiety and depressive disorders. Only 16.9% of the sample were in remission in the past 6 months, with the rest of the sample reporting disease activity that ranged from rarely active to constantly active. At the time of the study, 46.2% reported experiencing IBD-related complications. Finally, 14% of the participants were on either short- or long-term disability from work.

#### **6.4.2 Diagnostics**

A total of 274 participants submitted survey responses. As is common in surveys, there were some missing values (Mazza, Enders & Ruehlman, 2015). For participants who had several missing responses on one or more scales, data was deleted. A total of 29% of the original 274 participants showed this pattern, resulting in a final sample size of 195 participants. For these 195 participants, 15% missed some items, but no participant had missed more than 4, and the number of missed items was usually 1 or 2. The proportion of missing data points for the 195 participants was 0.2%. Little's MCAR test was conducted, and the result was not statistically significant,  $X^2(30) = 23.28, p = .80$ , and the remaining sporadic missing values, affecting 15% of the remaining participants' data, were considered to be missing at random. For these participants, mean values substitution was used to impute missing data. Finally, to test for univariate outliers on the variables to be analyzed, standardized scores were analyzed. None surpassed an absolute value of 3.29, indicating an absence of univariate outliers. To test for multivariate outliers, Mahalanobis Distance procedure was used. One multivariate outlier was detected, thus, this case was deleted.

### **6.4.3 Preliminary Evidence of the Construct Validity of Modified Scales**

#### **6.4.3.1 FFMQ**

If using a non-meditating sample, evidence suggests that the *Observing* sub-scale is best excluded to derive a 4-factor rather than 5-factor structure (Baer et al., 2008; Baer, 2016; Gu et al., 2017; Williams et al., 2014). Baer (2016) explains that observational attention can encompass an open quality, consistent with mindfulness, or it may be reactive, inconsistent with mindfulness, which could be a potential reason for the poor construct validity of this sub-scale in non-meditating samples. Preliminary analysis in the current study supported the exclusion of the *Observing* subscale. In the pooled meditator and non-meditator sample, *Observing* was inversely correlated with two of the four FFMQ sub-scales and positively correlated with the DASS (See Table C.2). Furthermore, when the analysis was repeated with a subsample of regular meditators ( $N = 42$ ) *Observing* was positively correlated with each FFMQ subscale and negatively correlated with the DASS. Therefore, to accurately capture trait mindfulness in the total group, the total FFMQ scores were calculated by summing all subscale scores except the *Observing* sub-scale. Since this represents a modification of the original scale, we report the modified measure as FFMQ-M.

#### **6.4.3.2 The Hot Flush Related Daily Interference Scale**

In this sample ( $n = 144$ ), the modified scale's inter-item reliability was excellent ( $\alpha = .95$ ) (Potter et al., 2019). A moderate correlation with a measure of symptom frequency ( $r = .39, p < .01$ ) and a measure of psychological stress ( $r = .44, p < .01$ ) supported the scale's convergent validity. In the current sample, inter-item consistency was excellent ( $\alpha = .96$ ). Responses were not normally distributed, with the data showing a positive skew.

#### **6.4.4 Confirming Assumptions of Linear Regression**

Linear regression maintains five assumptions: linearity, homoscedasticity, independence of observations, no multicollinearity, and normality of residuals. To test for linearity, homoscedasticity, and independence of observations, standardized residuals were plotted against the predicted values of  $Y$  using a scatterplot. This was done for the hypothesized mediation and moderation models. The independent variables in each of the models bore a linear relationship to the dependent variable, as indicated by a straight positively sloped line, confirming that the assumption of linearity was met. Further, the residuals remained approximately the same distance from the regression line when progressing upwards, suggesting the assumption of homoscedasticity was met. Finally, the residuals were distributed randomly around the regression line, rather than systematically, providing evidence that there was no correlation between the  $X$  and  $Y$  errors. Therefore, the assumption of independence was met. Multicollinearity was not evident in the data on the basis that Pearson's  $r$  statistics were all below .80 for the predictor variables, and the Variance Inflation Factor statistics from the collinearity analysis were less than 3. Finally, the standardized predicted values were plotted against the standardized residuals to test for normality of residuals. The errors on both sides of the horizontal line at zero seemed to approximately sum to zero, indicating normality.

#### **6.4.5 Analysis of Sex and Gender Differences**

The literature suggests women and men experience gastrointestinal conditions differently (Bjorkman et al., 2012; Chang et al., 2006). Because of this finding, differences on the primary measures between sexes and genders were tested. Independent samples  $t$ -tests were performed, with sex and gender as the independent variables and the five measures of interest as the dependent variables (FFMQ-M, DASS, SCS, IBD-SI, SCSM, IBD Symptoms). No significant

differences were found on the sex and gender variables for any of the primary outcome measures.

#### 6.4.6 Bivariate Correlations

To test for statistical relationships between each of the variables of interest, bivariate correlations were conducted. All variables were correlated with one another ( $p < .05$ ) (see Table 6.1). Together, these correlations provided preliminary support for testing the hypothesized mediation model.

#### 6.4.7 Hypothesized Parallel Multiple Mediation Model

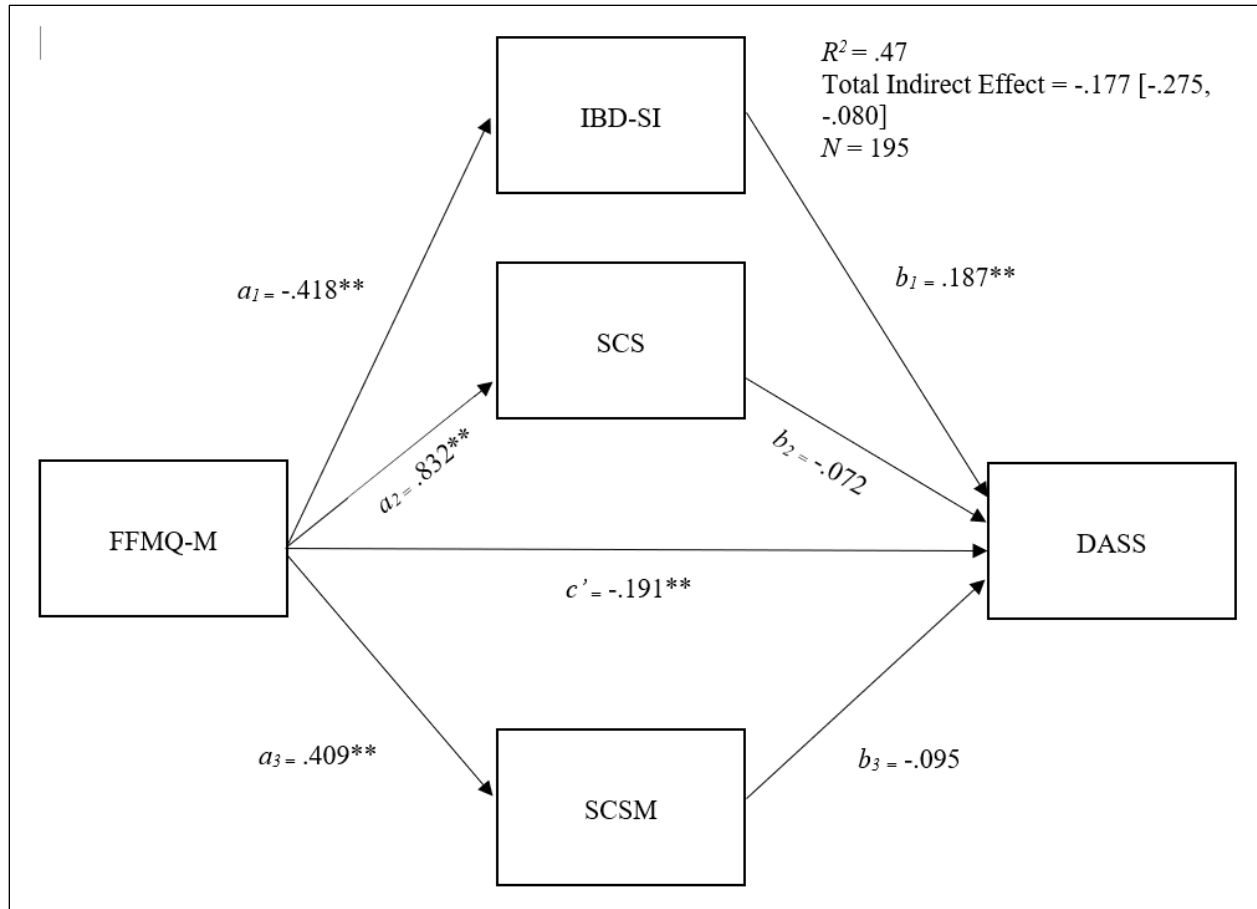
A parallel multiple mediation analysis was conducted with the proposed model: self-compassion ( $M_1$ ), perceived symptom interference ( $M_2$ ), and self-regulation ( $M_3$ ) as mediators of the relationship between trait mindfulness ( $X$ ) and psychological distress ( $Y$ ). Results showed that SCS, IBD-SI, and SCSM simultaneously mediated the relationship between FFMQ-M and DASS (see Figure 6.2). The total indirect effect of the model was significance indicated by the

Table 6.1

*Bivariate correlations with measures of interest*

$N = 195$	1	2	3	4	5	6
1. FFMQ-M	1	-.53**	-.27**	.73**	.53**	-.17*
2. DASS		1	.55**	-.50**	-.39**	.36**
3. IBD-SI			1	-.31**	-.19**	.72**
4. SCS				1	.50**	-.23**
5. SCSM					1	-.18*
6. IBD Symptoms						1

*Note.* \*\* Correlation is significant at the .01 level. \* Correlation is significant at the .05 level. FFMQ-M: Five-Facet Mindfulness Questionnaire without *Observing* subscale, DASS: Depression, Anxiety, Stress Scale-21, IBD-SI: IBD Symptom Interference, SCS: Self-Compassion Scale, SCSM: Self-Control and Self-Management Scale, IBD Symptoms: Symptom frequency and intensity.



*Figure 6.2.* Statistical multiple mediation model with unstandardized path coefficients: IBD symptom interference, self-compassion, and self-regulation as a significant set of mediators of trait mindfulness and psychological distress. *Note.* FFMQ-M: Five Facet Mindfulness Questionnaire, modified (excluding Observing sub-scale); IBD-SI: IBD Symptom Interference; SCS: Self-Compassion Scale; SCSM: Self-Control and Self-Management Scale; DASS: Depression Anxiety Stress Scale-21. **\*\*** indicates significance at the .001 level.

absence of zero in the confidence interval. The model accounted for nearly half of the variance in DASS outcomes. Further, the direction of paths *a* and *b* for all three variables aligned with the prediction that higher trait mindfulness would be statistically related to higher self-compassion, lower perceived symptom interference, and higher self-regulation, which consequently, would relate to lower psychological distress.

To test **Hypotheses 1a, 1b, and 1c**, that each of the three variables would mediate the relationship between the FFMQ-M and DASS while controlling for the other mediators in the

model (i.e., each proposed mediator would contribute unique variance to the total indirect effect), the specific indirect effects were assessed. Only Hypothesis 1b was confirmed. When examining the specific indirect effects, results indicated that IBD-SI was the only variable that contributed unique variance to DASS scores (see Table 6.2). Pairwise comparisons of the specific indirect effects showed no significant differences between the effects, suggesting no differences in the strength of the mediators (see Table C.3).

#### 6.4.8 Exploratory Analyses: Serial Models of Multiple Mediation

One possible explanation for the statistically non-significant findings for self-compassion and self-regulation in the parallel multiple mediation model is that these variables are intercorrelated. Although problematic multicollinearity was ruled out through statistical tests, Hayes (2013, pp. 156-157) states that correlations among variables that do not show

Table 6.2

*Parallel mediation: Total and specific indirect effects of trait mindfulness on psychological distress*

	Effect	SE	Bootstrapping 95% CI	
			Lower	Upper
<b>TOTAL Indirect Effect of Model</b>	<b>-.177</b>	<b>.050</b>	<b>-.275</b>	<b>-.080</b>
<b>IBD Symptom Interference</b>	<b>-.078</b>	<b>.021</b>	<b>-.122</b>	<b>-.040</b>
Self-Compassion	-.060	.046	-.152	.027
Self-Regulation	-.039	.026	-.089	.013

*Note.* Bold indicates significance

multicollinearity can nevertheless interfere with accurate mediation modeling. For example, single mediation models might show a mediating role for the variable, whereas a parallel model incorporating all variables does not. Therefore, when there are correlations between the proposed mediators, Hayes suggests using a serial multiple mediation model. A serial model differs from a parallel model in that the former assumes causal relations among the mediators (i.e., sequential relationships) while the latter does not (Hayes, 2013). Given the moderate correlation between self-compassion and self-regulation in this sample, a serial method to multiple mediation was utilized to further assess whether these variables statistically mediate role of trait mindfulness in IBD.

Given that both self-compassion and self-regulation have been proposed as components of mindfulness and given that experimental studies suggest that cultivating these qualities reduces psychological stress, the following two evidence-based models were generated for further testing:

**Exploratory Hypothesis A:** The correlation between trait mindfulness and low psychological distress in IBD will be accounted for by sequential statistical relations between (a) self-compassion, (b) self-regulation, and (c) perceived symptom interference.

**Exploratory Hypothesis B:** The correlation between trait mindfulness and low psychological distress in IBD will be accounted for by sequential statistical relations between (a) self-regulation, (b) self-compassion, and (c) perceived symptom interference.

Results of the serial multiple mediation analysis to test **Exploratory Hypothesis A** can be found in Table C.4. The analysis showed that the total indirect effect of the model was significant. This indicated that even after controlling for the effect of trait mindfulness on each of the three proposed mediators, associations remained among SCS, IBD-SI, and SCSM. However, the

specific indirect effect of FFMQ-M on DASS through first SCS, then SCSR, and then IBD-SI was non-significant, suggesting that the hypothesized sequence of causal relationships among these three mediators did not account for the association between FFMQ-M and DASS. A second serial multiple mediation analysis to test **Exploratory Hypothesis B** was conducted. The results can be found in Table 6.3. This analysis showed that the specific indirect effect of

Table 6.3

*Serial multiple mediation model 2: Total and specific indirect effects of trait mindfulness on psychological distress through self-regulation, self-compassion, and symptom interference*

	Effect	SE	Bootstrapping 95% CI Lower Upper	
<b>TOTAL Indirect Effect of Model</b>	<b>-.177</b>	<b>.050</b>	<b>-.275</b>	<b>-.080</b>
FFMQ-M → SCSM → DASS	-.039	.026	-.089	.014
FFMQ-M → SCS → DASS	-.053	.041	-.140	.025
FFMQ-M → IBD-SI → DASS	-.026	.031	-.092	.031
FFMQ-M → SCSM → SCS → DASS	-.007	.006	-.021	.003
FFMQ-M → SCSM → IBD-SI → DASS	-.005	.014	-.033	.022
<b>FFMQ-M → SCS → IBD-SI → DASS</b>	<b>-.042</b>	<b>.021</b>	<b>-.085</b>	<b>-.003</b>
<b>FFMQ-M → SCSM → SCS → IBD-SI → DASS</b>	<b>-.005</b>	<b>.004</b>	<b>-.014</b>	<b>-.000</b>

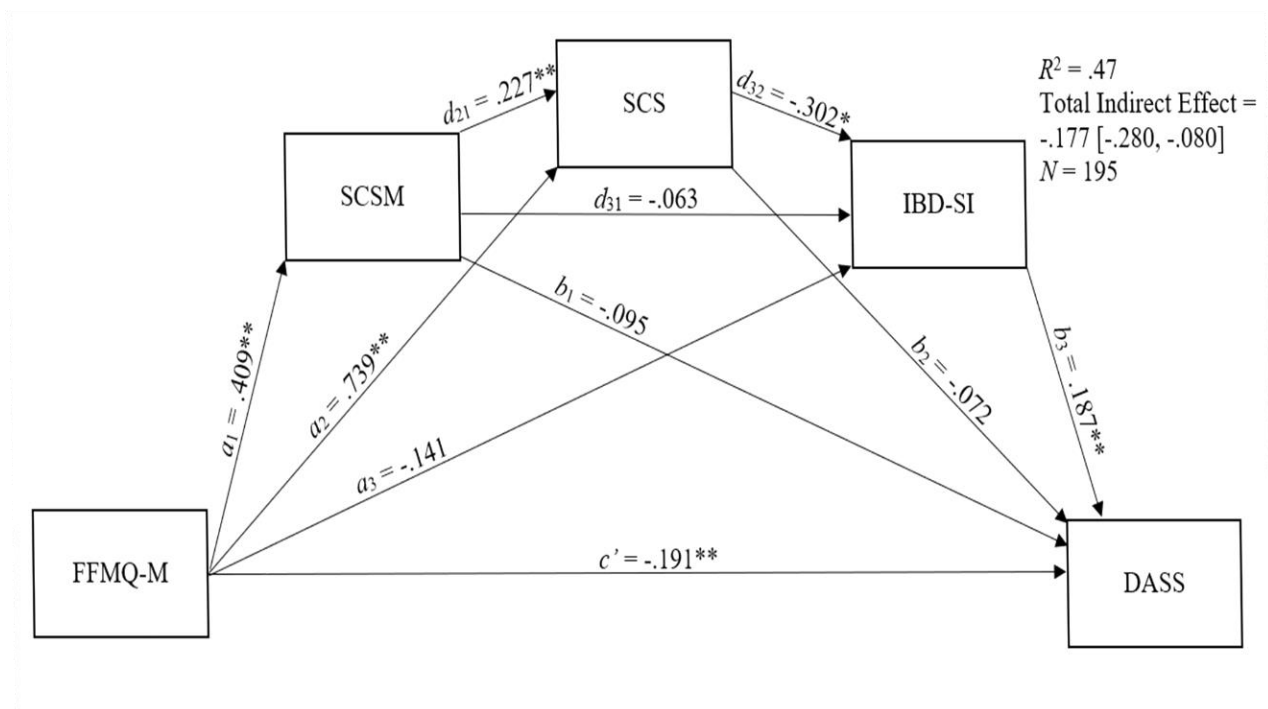
*Note.* Bold indicates significance



FFMQ-M on DASS through first SCSM, then SCS, and then IBD-SI was significant, suggesting that the hypothesized sequence of causal relationships among these three mediators partly accounts for the association between FFMQ-M and DASS in this sample (see Figure 6.3).

#### 6.4.9 Hypothesized Moderation Model

To test **Hypothesis 2**, that higher levels of trait mindfulness would moderate (weaken) the relationship between frequent IBD symptoms and higher perceived symptom interference, we conducted a test of moderation. The correlation between IBD symptoms and perceived symptom interference in this sample was large ( $r = .73$ ). Results showed no statistically significant interaction of IBD-Symptoms and FFMQ-M scores,  $\beta = -.005$ ,  $p = .91$ , indicating that trait



*Figure 6.3.* Statistical serial multiple mediation model with unstandardized path coefficients: The relationship between trait mindfulness and psychological distress in IBD is partly accounted for by the sequential statistical relations between self-regulation, self-compassion, and symptom interference. *Note.* FFMQ-M: Five Facet Mindfulness Questionnaire, modified (excluding Observing sub-scale); IBD-SI: IBD Symptom Interference; SCS: Self-Compassion Scale; SCSM: Self-Control and Self-Management Scale; DASS: Depression Anxiety Stress Scale-21.

mindfulness does not moderate the relationship between IBD symptoms and perceived symptom interference in this sample, and disconfirming hypothesis 2.

## **6.5 Discussion**

The primary purpose of this study was to examine three potential mediators of the relationship between trait mindfulness and psychological distress in IBD: self-compassion, perceived IBD symptom interference, and self-regulation (Hypothesis 1 and Exploratory Hypotheses A and B). An additional purpose was to examine whether trait mindfulness moderated the relationship between IBD symptoms and symptom interference (Hypothesis 2). The first hypothesis was only partially supported; IBD symptom interference proved to be the only significant mediator in the model after controlling for the effect of the other proposed mediators. To adjust for potential causal relations among the potential mediators, two serial multiple mediation models were tested. Exploratory Hypothesis B was confirmed: the relationship between trait mindfulness and psychological distress was partly accounted for by sequential relations among self-regulation, self-compassion, and symptom interference. In relation to the second hypothesis, trait mindfulness did not significantly moderate the relationship between IBD symptoms and symptom interference.

Overall, these findings help further our understanding of the reasons for the association between mindfulness and psychological distress in IBD. This study first demonstrates that when individuals with IBD have greater trait mindfulness, they are less likely to report psychological distress. This finding is not surprising given that trait mindfulness has been found to predict lower scores on both subjective and physiological measures of stress (Bullis, Boe, Asnaani & Hofmann, 2014; Fogarty et al., 2015), and predict lower reports of stress in other medical populations (Senders, Bourdette, Hanes, Yadav & Shinto, 2014). This result also aligns with

findings reported in a recent scoping review of psychotherapies for IBD; specifically, that mindfulness-based interventions reduced psychological distress (Duff et al., 2018). Similarly, a recent randomized control trial of Acceptance and Commitment Therapy, a form of MBI, showed effects on stress, anxiety, and depression in IBD (Wynne et al., 2019).

Results of the serial mediation analysis provide a potential explanation for the relationship between mindfulness and distress in IBD. This analysis suggests that individuals higher in trait mindfulness experience lower distress as a result of having greater self-regulatory abilities, which predict more self-compassion, which is, in turn, associated with lower levels of symptom interference. Thus, it can be concluded that self-regulation, self-compassion, and symptom interference are important variables to consider in the context of mindfulness and psychological well-being in IBD. This finding aligns well with a previous cross-sectional study exploring the psychological experiences of people with IBS (Potter et al., 2019). In the previous study, dispositional mindfulness was negatively associated with distress, and both lower symptom interference and higher self-compassion partly accounted for this relationship. The current study extended these findings to a different group of patients with bowel disorders by exploring potential sequential relations between these mediating variables, and by examining self-regulation as an additional mediator.

The current study also delineates potential pathways of the effects of mindfulness on distress in IBD. Of the variables explored in this study, it seems trait mindfulness first begins exerting its effects by influencing self-regulation. Similarly, in the qualitative description of mindfulness practice in IBD, participants described their mindfulness practice as leading to a sense of self-regulation, characterized by a sense of preparation, intention, and flexibility in their responses to stressors. A theoretical account of the relation between mindfulness and self-

regulation is proposed by Chatzisarantis and Hagger (2007). They propose that the present moment awareness of mindfulness helps the person to recognize not only their habitual responses, but also new aspects of their experience that were once outside of their awareness (e.g., emotions, attitudes, values). This broadened awareness is thought to make available a greater range of responses to stressors. Further, nonjudgmental attention to and non-overidentification with stressors is thought to strengthen nonreactivity (Shapiro et al., 2006), one aspect of self-regulation that allows one to respond with consideration and intention (Chatzisarantis & Hagger, 2007). It would be useful to examine self-regulation as a mediator of core outcomes (e.g., stress, distress, depression, anxiety) in experimental trials of MBIs.

Next, trait mindfulness and self-regulation predicted self-compassion in IBD. This finding was unexpected to some degree, as theory suggests self-regulation occurs as a result of these components (Shapiro et al., 2006) and self-compassion has been found to promote self-regulation in the context of medical conditions (Sirois, 2015; Terry & Leary, 2011). In line with the results of the current study, other theorists conceptualize self-compassion as a trait that relies on self-regulation. Specifically, it is thought that the capacity to soothe one's own suffering is determined by the self-regulatory abilities to act on intention, and regulate both attention (Neff & Dahm, 2015) and emotion (Scoglio et al., 2018). Another reason self-regulation predicted self-compassion in this study may be that mindfulness targeted a particular vulnerability in this sample: dysregulation. Specifically, disruption in self-body relations or one's sense of identity can occur in chronic illness, and theoretical models consider identity to relate to self-regulation (Berkman, Livingston & Kahn, 2017). This suggests that a disrupted sense of identity may compromise self-regulatory abilities in chronic illness. Thus, it is possible that the sequential

link between mindfulness, self-regulation, and self-compassion occurred because mindfulness was most helpful for easing the dysregulation from living with IBD.

Individuals that had greater trait mindfulness, self-regulation, and self-compassion were more likely to experience IBD symptoms as less bothersome, distressing, and interfering. This association between self-compassion and perceived symptom interference in IBD suggests that as one shifts from criticism and shame to self-soothing and acceptance, they are more able to live with their symptoms, and experience less interference from symptoms. Other research supports this assertion. In individuals with IBD, Trindade, Ferreira and Pinto-Gouveia (2017) found that illness-related shame (the opposite of self-compassion) was associated with more avoidance of internal experience and value-committed living, an indicator of symptom interference. Similarly, self-compassion has been found to protect against symptom interference in women experiencing menopause (Brown et al., 2014) and body image distress in breast cancer (Przedziecki et al., 2013). To better understand the relationship between self-compassion and symptom interference in the context of mindfulness and IBD, it would be worthwhile to conduct experimental research with MBIs to determine whether increased self-compassion reduces symptom interference in IBD.

The final pathway in the statistical serial mediation of trait mindfulness was that from symptom interference to psychological distress. As a result of a tendency to be mindful, self-regulatory, and self-compassionate, and consequently, a disinclination to perceive symptoms as interfering, individuals' distress was more likely to be low. Research has found MBIs to reduce illness-related interference in other health populations, including chronic pain (Garland et al. 2014) and cancer (Eyles et al. 2015). However, whether such reductions in interference were responsible for improvements in psychological well-being was not tested. The results of the

current study build on the research by showing that symptom interference may account for this therapeutic effect of mindfulness. This finding makes sense considering that distress can accompany the interference from symptoms of abdominal and joint pain, diarrhea, weight loss, and fatigue, (Sajadinejad et al., 2012). Future research should focus on the relationships between mindfulness, symptom interference, and psychological distress experimentally in both IBD and other chronic illness populations.

Disproving the second hypothesis, a test of moderation showed that trait mindfulness did not weaken the relationship between IBD symptoms and symptom interference. That is, at every level of trait mindfulness, IBD symptom severity bore approximately the same association with symptom interference. This finding contrasts with Potter et al.'s (2019) results in an IBS sample, which demonstrated that the magnitude of the association between IBS symptom frequency and symptom interference was weaker among individuals with high levels of trait mindfulness. The non-significant moderation finding also contrasts with theoretical and experimental literature on MBIs. For instance, theory would suggest that mindfulness promotes greater psychological resiliency (in this study, hypothesized as less symptom interference) despite ongoing illness, a philosophy reflected in Kabat-Zinn's (1990) Mindfulness-Based Stress Reduction program: "facing illness with ease."

One possible explanation is that the IBD symptom severity measure in this study included both symptom frequency and intensity, whereas the Potter et al. (2019) study focused only on symptom frequency. Another possible explanation is related to the large correlation between IBD symptoms and symptom interference in the current study's sample ( $r = .73$ ). This correlation was the largest among all variables studied, and larger than in Potter et al.'s (2019) IBS sample ( $r = .39$ ). It is possible that, given the strength of this relationship, it is difficult for

trait mindfulness to moderate (buffer) the interference of IBD symptoms in everyday life. Given other findings in the current study, this does not rule out the importance of mindfulness in IBD for targeting symptom interference. However, this result does raise some questions about what it takes to mitigate the large correlation between IBD symptoms and interference in this population. It would be interesting to test whether regular, formal mindfulness practice or mindfulness interventions produce the hypothesized moderating effect.

The strong relationship between IBD symptoms and symptom interference suggests IBD symptoms create substantial interference in daily functioning, and as compared to one study, perhaps more so than symptoms of IBS. Although some research suggests that people with IBS report worse psychological outcomes and health-related quality of life than those with IBD (Pace et al., 2003; Walker, Gelfand, Gelfand & Katon, 1995), there are important differences between the current sample and the sample used by Potter and colleagues. In the IBD sample, nearly half of the participants reported experiencing IBD-related health complications, and further, 14% were on either short-or long-term disability from work. This degree of impairment stands in contrast to the IBS sample whose enrollment in university suggests they were relatively higher functioning. Therefore, in this case, the differences in symptom interference may partly be due to the participant demographics and level of functioning in the current study's sample.

### **6.5.1 Limitations and Future Research**

This research is not without limitations. First, the sample included more females than males. Nevertheless, since research indicates that women are more likely to have IBD than men in Canada (CCFC, 2012), this imbalance comes close to being representative of the IBD population. In addition, there is a potential influence of single method variance on the findings, especially given high correlations between some variables. Lastly, and perhaps most

significantly, causal inferences cannot be made from these findings. This study employed a cross-sectional design, and all measures were obtained simultaneously, precluding conclusions about temporal or causal relationships.

The current study suggests important directions for future research. Given the limitations of the cross-sectional design, it would be beneficial to apply an experimental design to the question of mediators of mindfulness in an IBD population. The design could include multiple time-based measurements of self-regulation, self-compassion, symptom interference, and other disease-specific variables that might also mediate outcomes, such as self-identity or illness-related distress or shame. Lastly, future cross-sectional research in mindfulness for IBD might benefit from additional measures of mindfulness, including self-reported mindfulness meditation practice, and current or previous exposure to MBIs.

## **6.6 Conclusion**

The purpose of this study was to investigate disease-specific statistically mediating and moderating factors of the relationship between trait mindfulness and psychological distress in IBD. Serial modelling demonstrated that self-regulation, followed by self-compassion, and then low IBD symptom interference, partly accounted for an inverse association between trait mindfulness and psychological distress. Unexpectedly, and in contrast to research with other chronic illnesses, trait mindfulness did not moderate the relationship between IBD symptom severity and symptom interference. This was surmised to be related to the strength of the relationship between symptom severity and interference in this sample relative to other chronic illness samples. Overall, these cross-sectional findings, and their consistency with other cross-sectional and theoretical reports, suggest the need for further experimental research on mindfulness in IBD, with particular attention to disease-specific mechanisms of change. If the



results of this study can be experimentally replicated, they might allow MBIs to be better tailored to individuals with IBD, thereby optimizing psychological functioning in this population.

### **Transition**

Chapter 6 examined disease-specific factors in the context of mindfulness and IBD. As predicted, self-regulation, self-compassion, and symptom interference all statistically mediated the relationship between trait mindfulness and psychological well-being in this population. In Chapter 6, Study 3 built upon Studies 1 and 2 by providing additional insight into how mindfulness may lead to positive outcomes in IBD, while also highlighting areas needing further study. The final chapter of this dissertation, Chapter 7, constitutes a general discussion of this research program. It includes an overview of results from psychotherapy studies focused on IBD, paying particular attention to a relatively low evidence base for treating IBD-related anxiety and depression with MBIs. It is argued that further attention to the disease-specific factors that contribute to mental illness, and to population-specific mechanisms of psychotherapeutic change, may help to resolve this problem. The broader implications of discoveries from this program of research are discussed, with particular attention to the enhancement of MBIs for IBD. Lastly, some strengths and limitations of this program of research are reviewed.

## Chapter 7. General Discussion

The aim of the current research was to provide a comprehensive examination of mindfulness in IBD. The work consisted of literature reviews of chronic illness and mindfulness, a systematic scoping review of psychological interventions in IBD, a qualitative inquiry into experiences of mindfulness meditation in IBD, and a quantitative study of statistical mediators of trait mindfulness and psychological distress in this population. The results help build on our understanding of the therapeutic nature of mindfulness in the IBD population, and further, provide implications for future research and clinical practice.

### 7.1 Psychotherapy for IBD: Are Results “in the Toilet”?

The scoping review conducted in Study 1 demonstrated that psychological interventions have potential to influence a variety of physical and psychological outcomes in IBD. Hypnosis shows promise for managing disease activity, while MBIs and CBT appear to improve quality of life and coping. Currently, evidence that psychological treatments help to reduce or control symptoms associated with IBD-comorbid psychopathology, such as anxiety and depression, is limited, except in the case of MBIs and stress management therapies, which have shown some promise. This suggests a need for more study on how to best treat anxiety and depression in IBD.

One possible explanation for mixed evidence of psychotherapy effectiveness for IBD-comorbid anxiety and depression is that few psychotherapies address the complex needs of this IBD subpopulation. Many of the psychotherapies identified in the scoping review seemed to only target a narrow scope of outcomes (e.g., health concerns *or* anxiety and depression) rather than a variety of concerns (e.g., health concerns, anxiety, and depression). Indeed, results of the scoping review showed MBIs to be the only psychotherapy showing promise for comprehensively addressing some of the needs of this population (e.g., health-related concerns, anxiety, and

depression), and the qualitative and quantitative studies in this research also demonstrated promise for mindfulness targeting both IBD-related factors and anxiety and depression. One issue with a narrow treatment scope is that this approach fails to consider the interactive nature of psychological issues for people who have a complex set of needs that include health concerns, anxiety, and depression. For instance, anxiety and depression can be treated, but if health concerns are not attended to, anxiety and depression may be sustained, as health concerns can contribute to psychopathology (Dersh, Polatin & Gatchel, 2002). Therefore, in line with evidence-based practice (Lilienfeld et al., 2014), there seems to be a need to evaluate MBIs that show empirical support (i.e., research and scientific evidence for its effectiveness) and align with this population's concerns (i.e., clients' needs with regards to health, anxiety, and depression).

## **7.2 Psychotherapy for IBD: Addressing Mechanisms of Change**

### ***7.2.1 The Value of Identifying Mechanisms of Change in Psychotherapy***

Researchers have been urged to examine mechanisms of change in psychotherapy for various reasons. Lilienfeld, Ritschel, Lynn, Cautin and Latzman (2014) emphasize that understanding mechanisms of change will help confirm that it is indeed the therapy leading to change. Knowing that therapeutic components are indeed facilitating change promotes evidence-based decision-making in clinical practice (Persons, 2007). For example, identifying such mechanisms can help with better understanding how to tailor therapies for optimal change (Kazdin, 2007). Moreover, identifying therapeutic components helps with eliminating intervention components that do not seem to be effective (Lemmens, Muller, Arntz & Huibers, 2016). Understanding of the most effective therapeutic components will help support evidence-based decision-making in clinical care of people with IBD. This is important in the context of

IBD, as psychotherapies have so far shown limited support for treating anxiety and depression in IBD (Duff et al., 2018).

Psychotherapy for chronic pain is one area that has benefited from research on mechanisms of change. In fact, such research gave rise to the paradigm shift from CBT to MBIs (or “third wave CBT”) for chronic pain populations. McCracken and Vowles (2014) point out that by better understanding the therapeutic processes of CBT for chronic pain, we have been able to harness a directional shift with chronic pain research and intervention. More specifically, a body of research demonstrated that CBT’s mechanism of cognitive restructuring was not actually leading to therapeutic outcomes in pain, and in some cases, was even causing harm. This insight highlighted the need for incorporating acceptance-based approaches into CBT for chronic pain, a change that was argued to be more aligned with the chronic and realistic nature of health conditions, and to be a necessary shift after 25 years of traditional CBT with this population. Since this shift, we are now seeing a growing evidence base supporting the use of MBIs in chronic pain (Harrison, Scott, Johns, Morris & McCracken, 2017). The current research aimed to build on such advancements by exploring processes of mindfulness in another population with a chronic medical condition: IBD.

### ***7.2.2 Current Research: Potential Mechanisms of Mindfulness in IBD***

Theoretical and empirical research in mindfulness suggests that MBIs support psychological well-being in chronic illness, including IBD. As a result, research into mechanisms through which MBIs promote change has grown. Theoretical models have proposed a number of potential mechanisms, and systematic reviews of mediators of mindfulness have identified both similarities and differences across psychological and physical conditions. Notably, there is a need to determine whether mechanisms of mindfulness are universal and/or

disease-specific across conditions (Alsubaie et al., 2017). The current research aimed to fill this gap in the literature on mindfulness and IBD by exploring potential mediators in this population.

To incorporate the voices of those living with IBD, one approach to understanding potential mediating variables was to conduct a qualitative study (Study 2). Through interpretive phenomenological analysis, mindfulness meditation was seen to facilitate well-being in the sample through awareness, nonjudgmental experiential engagement, and acceptance, and consequently, self-regulation and resilience. Quantitative study was also utilized to further an understanding of the mechanisms of mindfulness in this population (Study 3). The design was informed both by the literature and Study 2. Serial mediation showed that sequentially, self-regulation, self-compassion, and symptom interference mediated relations between trait mindfulness and psychological distress in IBD. Together these studies help in furthering our understanding of how mindfulness relates to psychological well-being in this population.

Returning to Alsubaie et al.'s (2017) terms, *universal* and *disease-specific mechanisms of mindfulness*, the current research appears to highlight both. First, most of the constructs identified can be described as universal mechanisms of mindfulness, as they have been found mediate mindfulness and therapeutic outcomes across various populations (Alsubaie et al., 2017; Gu et al., 2015). These constructs include awareness, nonjudgmental engagement with experience, acceptance, self-regulation, resilience, and self-compassion. The construct that is most evidently disease-specific is IBD symptom interference. At the same time, however, the more nuanced descriptions from Study 2 suggest that each of these constructs functioned in a unique way in an IBD population. For instance, although awareness can be described a universal mechanism of mindfulness, in this population, awareness functioned in a manner that interacted with IBD: mindfulness allowed growth in awareness *of illness symptoms*, awareness *of responses*

*to illness*, and awareness of *experiences other than illness*, highlighting the unique way mindfulness functions in this population. The same argument for disease-specific mechanisms can be argued for each of the other constructs identified in this research: nonjudgmental and compassionate engagement *with the body*, nonjudgmental and compassionate engagement *with pain*, acceptance of *the limits of control in illness*, self-regulation *in response to illness-related stressors*, resilience *in the face of illness*.

Similarly, we see this overlap between universal and disease-specific mechanisms in other research examining mechanisms of mindfulness in chronic illness. This is illustrated well by the work of Loucks et al (2015). These authors conducted a review on the relationship between mindfulness and cardiovascular risk factors in order to propose a theoretical framework for the ways in which mindfulness might affect these factors. Based on their review, they theorized that attentional monitoring, emotion regulation, and self-awareness facilitate the therapeutic effects of mindfulness in cardiovascular disorders. For instance, they explained that focused and nonjudgmental attention on experiences such as smoking, diet, and physical activity could support self-insight and healthy decision-making. Further, improved emotional regulation could prevent stress and reactivity to cravings, lower blood pressure, and increase self-efficacy. Lastly, greater self-awareness could promote health behaviours by increasing bodily awareness. While the authors argued that these factors are disease-specific, there is evident overlap between universal mechanisms of mindfulness (e.g., attentional monitoring) and mechanisms unique to cardiovascular populations (e.g., attentional monitoring *of illness and healthy decision-making*). Aligning with the goal of the current research, these authors argued that such work will help in customizing MBIs and optimizing therapeutic change for this specific medical population.

The current research identified potential mechanisms of mindfulness for an IBD population that are both universal and disease-specific. Overall, it seemed that mindfulness related to psychological well-being in IBD through an adaptive relationship with experience: greater awareness of both negative and positive aspects of experience; engaging with stress and pain with nonjudgment and acceptance; cultivating compassion for one's own experiences of suffering; perceiving symptoms as less interfering; and cultivating greater regulatory control in the face of adversity. Some of these results align well with other research on mechanisms of mindfulness in chronic illness. Loucks et al. (2015) propose that mindfulness supports therapeutic change in cardiovascular conditions through a fuller awareness of both positive and negative experience, a result that aligns with findings from Study 2. As well, mindfulness is thought to support therapeutic change in IBS by changing psychological responses to gastrointestinal symptoms (Garland et al., 2012; Potter et al., 2019; Tillisch et al., 2016), a finding that aligns well with the low levels of symptom interference among participants high in trait mindfulness and low in distress in Study 3. A particularly interesting finding extending from the current research program is that self-regulation was the only mediating variable identified in both qualitative and quantitative research on mindfulness and IBD; that is, by both Study 2 and Study 3. This finding suggests the need for a more robust exploration of the nature of self-regulation, its role in psychotherapy (including MBIs), and why it may have particular relevance to psychological well-being in an IBD population.

### ***7.2.3 Self-Regulation as an Important Mechanism of Mindfulness in IBD***

Self-regulation is described as the ability to respond to stimuli intentionally and purposefully in a manner that is guided by forethought (Bandura, 1991). Newman and Wallace (1993) propose that people vary in the degree of self-regulatory ability, and that deficits can lead

to psychopathology and behavioural disorder. These authors use the concept of *response modulation* to explain this effect of self-regulation on behaviour. Response modulation involves suspending a habitual response set in order to evaluate the degree of punishment and/or reward. The authors note that individuals with response modulation deficits will persist in their behaviours despite negative consequences, as they lack the ability to monitor, evaluate, and alter behaviour. In the case of an anxiety or depressive disorder, these self-regulatory deficits may manifest as perpetual avoidance of healthy and adaptive situations (e.g., socializing), as the person has difficulty monitoring, evaluating, and altering their avoidance behaviour.

Theory on the origins of self-regulatory deficits helps to explain why self-regulation might be an important mechanism of psychotherapy. In particular, attachment theory holds that underdeveloped self-regulatory abilities can stem from attachment disruption and lead to emotional and behavioural dysregulation, creating psychopathology. Attachment encompasses children's interactions with their caregivers that have long-term effects on their development (Main, 1996). When children are chronically exposed to environments that are inconsistent, unpredictable, rejecting, negligent, or harmful, this can result in attachment disruption (or deficits in identity and emotional regulation) (Kinniburgh, Blaustein & Spinazzola, 2005). Such exposure can deprive the child of learning more sophisticated skills for self-regulatory coping, thereby forcing the child to rely on primitive (i.e., reactive), maladaptive coping approaches that, when they persist into adulthood, can manifest as psychopathology (Kinniburgh et al., 2005).

As further evidence of the importance of self-regulation in psychotherapy, it is proposed that psychopathology can develop from one's responses to their own self-regulatory deficits. That is, failure to self-regulate can lead to both depression and anxiety, as continuous failure in self-regulation is thought to create discrepancies between the *actual self* and *ideal* (or *ought*) *self*



(Strauman et al., 2013). This suggests that there may be cases when individuals have secure attachments (and thus, previously acquired self-regulatory skills) but situational demands or stressors overwhelm their self-regulatory abilities. Therefore, deficits in self-regulation result not only from developmental trauma but also from situational stressors, and these two factors, or a combination, are hypothesized to be the most common underlying reasons that individuals require psychotherapy.

Another reason self-regulation plays an important role in psychotherapy is that it is an inherent component of all psychotherapeutic approaches. Either explicitly or implicitly, all psychotherapies aim to build or restore self-regulation with the ultimate goal of enhancing psychological well-being. This is evident in the various forms of self-regulatory interventions studied over the decades: self-regulation techniques for impulse control disorders (Bergin, 1969), self-regulation plus aversive conditioning for problem drinking (Caddy & Lovibond, 1976), body-oriented self-regulation methods for psychosomatic conditions (Ikemi, Tomita, Kuroda, Hayashida & Ikemi, 1986), and cognitive-behavioural self-regulatory interventions for borderline personality (Westen, 1991). We can also see the common target of self-regulation across the different therapeutic orientations and approaches that are prominent today. CBT teaches self-regulatory skills such as cognitive restructuring and behavioural monitoring (Nocon et al., 2010). MBIs also facilitate self-regulation through teaching self-regulatory skills such as attentional control and cognitive/behavioural flexibility, as seen in Acceptance and Commitment Therapy (Zarling, Lawrence & Marchman, 2015) and Dialectical Behaviour Therapy (Davenport, Bore & Campbell, 2015). One MBI, called MBSR, teaches attentional control and cognitive/behavioural flexibility through meditation (Kabat-Zinn, 1985). Process-oriented therapies, such as interpersonal/psychodynamic and body-oriented interventions, facilitate self-

regulation through the attachment system, activated in the therapeutic relationship (i.e., attachment processes like attunement, mirroring, and containment promote the development of emotional regulation) (Klopstech, 2005). Thus, while psychotherapies may differ in their approach to targeting this construct, it can be argued that self-regulation is a therapeutic mechanism of change across all psychotherapies.

So why is self-regulation important to the IBD population? As noted, deficits in self-regulation from early childhood trauma and/or taxed self-regulatory systems from situational demands can create distress and psychopathology. Indeed, both situations are common in chronic illnesses like IBD. As seen in the current research, there is literature that shows early childhood trauma and insecure attachment correlate with chronic illness (Meredith & Strong, 2019). Moreover, IBD and symptom interference is associated with psychological distress and psychopathology (Sajadinejad et al., 2012), suggesting the demands of illness can tax one's self-regulatory abilities. Therefore, it seems that individuals with IBD are vulnerable to deficits in self-regulation and consequential distress and psychopathology.

Indeed, in a qualitative study, individuals with IBD described self-regulation as a crucial component of their psychological well-being (Wolfe and Sirois, 2008). Interestingly, however, not many researchers have explored self-regulation in chronic illness or IBD outside of examining its effects on health behaviour, primarily treatment adherence (Karekla, Karademas & Gloster, 2018). This may be a result of the widespread adoption of self-management approaches and illness prevention within health care. It seems that the research focus on self-regulation in chronic illness could be expanded beyond behaviour change. This approach may help in understanding the effects of self-regulation on *overall* psychological well-being, and importantly, would align with the goal of stress and illness prevention in chronic illness populations.

## **7.3 Psychotherapy for IBD: Moving forward**

### ***7.3.1 Anxiety and Depression in IBD***

The current research provides early evidence that MBIs are capable of comprehensively addressing the complex needs of an IBD population. That is, MBIs may be particularly useful to the population as a form of psychotherapy that addresses both health concerns and psychopathology. Given the limitations in the current evidence base for MBIs in IBD, it would be useful for future research to explore the effects of MBIs that are empirically supported and align with the needs of this population.

Some researchers are pursuing this path. For example, with an IBD population, there have been recent randomized controlled trials of Acceptance and Commitment Therapy (ACT) for IBD. ACT is a mindfulness-based empirically supported treatment for anxiety and depression that also aligns with the needs of this population by emphasizing acceptance, self-regulation, and resilience – important treatment components in IBD, as suggested by the current research. These studies found depression, anxiety, and stress to be reduced by 39% (Wynne et al., 2019) and 42% post-intervention (Rowan et al., 2017). Dialectical Behaviour Therapy (DBT) is another type of empirically supported MBI that emphasizes components relevant to IBD (e.g., self-regulation and managing the dialectic of acceptance and change). Unfortunately, few researchers have examined DBT as an intervention for illness populations. There is the exception as seen in one study with adolescents with chronic kidney disease (Hashim, Vadnaid & Miller, 2013). These authors examined the effects of DBT on illness acceptance. There was a non-significant increase in acceptance, however, the sample size was small. The current research suggests exploration of DBT for chronic illness populations like IBD to determine whether they promote self-regulation, acceptance, and adjustment. Thus, future research on psychotherapy in IBD would benefit from

further exploration of these two mindfulness-based empirically supported treatments for anxiety and depression (i.e., ACT and DBT).

### ***7.3.2 Self-Regulation***

There is a need to expand research focus to include the examination of effects of self-regulation on overall psychological well-being in chronic illnesses like IBD, as opposed to merely examining the effects on behaviour change or illness management. A recent study argues for the need for psychological interventions to promote self-regulation in chronic illness, suggesting that self-regulation could enhance health, adaptation, well-being in these populations (Karekla, Karademas & Gloster, 2018). Further, it may be that self-regulation not only supports coping with health and disease-specific concerns, but also targets more complex psychological factors like anxiety and/or depressive disorders. Indeed, there is evidence to suggest self-regulation can reduce anxiety and depression (Hofmann, 2014), interpersonal distress (Mikaeili & Barahmand, 2013), and the effects of trauma (McCraty & Zayas, 2014). Therefore, it seems likely that similar effects would be seen in chronic illness.

Lastly, researchers could also build on the current research by exploring relations among mindfulness, self-regulation, and attachment in IBD, along with the other variables explored in this study (self-compassion, symptom interference, and psychological distress). A recent RCT examined the effects of an Attachment Based Compassion Therapy (ABCT) on psychological well-being in fibromyalgia (Montero-Marin et al., 2018), and interestingly, many of the proposed variables in the current research were studied. The intervention integrated attachment, compassion, and mindfulness as therapeutic components, and examined outcomes including anxiety, depression, and functional interference of their illness. Results showed that the intervention group had significantly greater improvement on outcomes compared to controls, and

improvements were maintained 3 months post-treatment. It would be interesting to see if ABCT showed similar results in the IBD population.

### ***7.3.3 Mindfulness and its Mechanisms in IBD***

The current research provides evidence that supports the use of mindfulness in IBD. It also identifies potential mediators of therapeutic change. Moving forward, it would be beneficial to apply an experimental design to the question of the effectiveness of mindfulness in IBD and its therapeutic processes. To strengthen the design, researchers are encouraged to follow the criteria proposed by Kazdin (2007) in determining mediators and moderators in psychotherapy. While the current research explored mediators such as self-regulation, self-compassion, and symptom interference, other variables suspected of mediating outcomes could also be considered, such as universal mechanisms (e.g., psychological flexibility) or IBD-specific (e.g., pain or body image). An exploration of moderators may also be useful, as this can help in identifying which sub-populations in IBD may be best suited for MBIs. For instance, such research in depression populations has shown that behavioural activation (a type of psychotherapy) works best for individuals with high symptoms at the start of therapy (Lilienfeld et al., 2014). Importantly, there is evidence to suggest that mindfulness is not suitable for all individuals, and that it may even cause negative outcomes in certain cases (Reynolds, Bissett, Porter & Consedine, 2017). Research exploring non-therapeutic outcomes of mindfulness, and what factors relate to such outcomes in IBD, is also necessary.

### **7.4 Strengths and Limitations**

Some limitations are acknowledged. First, this research relied on self-report methods. Study 1 was a review of intervention studies that relied on self-reports of mindfulness, stress, coping, and other relevant variables. Similarly, Study 3 examined statistical relationships among

relevant self-report measures. It is well known that self-report measures are vulnerable to common method bias, including rater effects (e.g., social desirability or the tendency to maintain response consistency) (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Study 2, a qualitative study, also relied on interviews to generate retrospective self-reports. Although interview data is valuable, it can be limited when compared with direct observation (Stukey et al., 2014). Overall, self-reports provide a convenient and rich source of data on inner experience with the limitation of a higher likelihood of inaccurate responses. This limitation can be less conveniently addressed with alternate methods, including direct observation and prospective self-report.

A second limitation of this study is the use of convenience sampling in Studies 2 and 3. Convenience sampling can facilitate recruitment and maximize sample size. Yet, it introduces the possibility of selection bias, which can be associated with poorer generalizability of findings. That is, research participants may share characteristics that distinguish them from non-research participants with IBD. Random or maximum variation sampling methods are superior for ensuring a representative sample (van Hoeven, Janssen, Roes & Koffijberg, 2015).

Third, the research utilized various methodologies for studying the influence of mindfulness in IBD. This can be seen as a strength in that it provides a comprehensive exploration of the construct. However, some associated limitations are acknowledged. In particular, Study 1 and Study 2 assessed mindfulness in the context of meditation, whereas Study 3 assessed trait mindfulness, which is arguably a different, albeit related, construct (Grossman & Van Dam, 2011). Therefore, although a multi-method approach allowed for a comprehensive investigation of the effects of mindfulness, comparisons across studies are best made with equivalent constructs.

Fourth, while relationships were identified between mindfulness and psychological variables in IBD, causal relations cannot be concluded. It is important to note that the results of this research are descriptive and correlational. Although a number of variables were found to be associated with mindfulness in Study 2 and Study 3, neither the qualitative nor quantitative study relied on the manipulation or control of participants' mindfulness practice. To understand causal relationships between the variables under study, it will be necessary to utilize other methods, such as experimental manipulation and assessment across time (Kazdin, 2007). Nonetheless, descriptive and correlational research does provide direction for future research by offering hypotheses to explore.

### **7.5 Conclusion**

IBD is a chronic medical illness accompanied by abdominal pain, diarrhea, fatigue, and other bodily complications. Research demonstrates unique psychosocial challenges in IBD and suggests some potential benefits of MBIs for this population. The aim of the current research was to conduct a comprehensive examination of the influence of mindfulness in IBD. This research was done using three individual studies. Study 1 was a systematic scoping review that identified psychological interventions examined in IBD (including MBIs), along with associated improvements. MBIs demonstrated support for improving psychological well-being in IBD. Through qualitative inquiry, Study 2 provided an enriched understanding of experiences with IBD in people practicing mindfulness. Lastly, Study 3 found support for statistical mediators of trait mindfulness in IBD. Together, results from the three individual studies build upon our understanding of the relevance of MBIs to people with IBD by describing the effects of psychological interventions in this population (Study 1), and identifying potential mechanisms by which mindfulness exerts its effects (Studies 2 and 3). Such knowledge is important for

informing research on psychological treatments in IBD and optimizing treatment success in this population.



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## **APPENDIX A:**

### **List of Interview Questions from Study 2**

1. Tell me about your experiences with mindfulness.
2. Tell me about your experiences with your illness since you started practicing mindfulness.
3. Tell me about your experiences with yourself as a person since you started practicing mindfulness. (What has been the impact on your goals, values, or beliefs? Your sense of self or identity? How you relate to yourself?)
4. Since you started practicing mindfulness, tell me about your experiences with your body. (What is it like: (a) living in your body, (b) feeling your body, (c) listening to your body, (d) knowing your body, (e) relating to your body?)
5. Since you started practicing mindfulness, tell me about your experiences with your health. (What has been the impact on your physical health? Your mental health?)
6. Since you started practicing mindfulness, tell me about your experiences with your relationships.
7. If you had never discovered mindfulness meditation, how would your life be different?

## **APPENDIX B:**

### **Study 3 Scales**

\*Note. Since I do not have the right to distribute copies of some of these scales, the following will only be used for the purpose of this research proposal.

#### **Demographics**

**Sex:**

Male ☐ Female ☐ Other ☐

**Age:** \_\_\_\_\_

**Ethnicity:** \_\_\_\_\_

**Relationship Status:**

Single ☐ Partner (6+ months) ☐ Married ☐ Divorced/Separated ☐ Widowed ☐

**Type of IBD Diagnosis:**

Crohn's Disease ☐ Ulcerative Colitis ☐ Other ☐

**Years Since IBD Diagnosis:** \_\_\_\_\_

**Other Diagnosed Physical or Psychological Conditions:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**Experience with Mindfulness Meditation:**

Less than 6 months ☐

6 months - 1 year ☐

1-3 years ☐

3-5 years ☐

More than 5 years ☐

### Symptom Frequency

Please respond to the following questions:

In the past six months, my disease has been...

Constantly active, giving me symptoms every day ☐

Often active, giving me symptoms most days ☐

Sometimes active, giving me symptoms on some days (for instance 1–2 days/week) ☐

Occasionally active, giving me symptoms 1–2 days/month ☐

Rarely active, giving me symptoms on a few days in the past six months ☐

I was well in the past 6 months, what I consider a remission or absence of symptoms ☐

### IBD Symptom Interference: Modified Version of the Hot Flush Related Daily Interference Scale

Please circle one number to the right of each phrase to describe how much **DURING THE PAST TWO WEEKS** your IBD symptoms **INTERFERED** with each aspect of your life.

	<hr/>										<b>Did not interfere</b>	<b>Completely interfered</b>
<b>1. Work</b> (work outside the home and housework)	0	1	2	3	4	5	6	7	8	9	10	

<b>2. Social activities</b> (time spent with family, friends, etc)	0	1	2	3	4	5	6	7	8	9	10
<b>3. Leisure activities</b> (time spent relaxing, doing hobbies, etc.)	0	1	2	3	4	5	6	7	8	9	10
<b>4. Sleep</b>	0	1	2	3	4	5	6	7	8	9	10
<b>5. Mood</b>	0	1	2	3	4	5	6	7	8	9	10
<b>6. Concentration</b>	0	1	2	3	4	5	6	7	8	9	10
<b>7. Relations with others</b>	0	1	2	3	4	5	6	7	8	9	10
<b>8. Sexuality</b>	0	1	2	3	4	5	6	7	8	9	10
<b>9. Enjoyment of life</b>	0	1	2	3	4	5	6	7	8	9	10
<b>10. Overall quality of life</b>	0	1	2	3	4	5	6	7	8	9	10

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### Dispositional Mindfulness: Five Facet Mindfulness Questionnaire

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

- 1= Never or Very Rarely True  
2 = Rarely True  
3 = Sometimes True  
4 = Often True  
5 = Very Often or Always True

- \_\_\_\_\_ 1. When I'm walking, I deliberately notice the sensations of my body moving.  
\_\_\_\_\_ 2. I'm good at finding words to describe my feelings.  
\_\_\_\_\_ 3. I criticize myself for having irrational or inappropriate emotions.  
\_\_\_\_\_ 4. I perceive my feelings and emotions without having to react to them.  
\_\_\_\_\_ 5. When I do things, my mind wanders off and I'm easily distracted.  
\_\_\_\_\_ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.

- \_\_\_\_\_ 7. I can easily put my beliefs, opinions, and expectations into words.
- \_\_\_\_\_ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
- \_\_\_\_\_ 9. I watch my feelings without getting lost in them.
- \_\_\_\_\_ 10. I tell myself I shouldn't be feeling the way I'm feeling.
- \_\_\_\_\_ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
- \_\_\_\_\_ 12. It's hard for me to find the words to describe what I'm thinking.
- \_\_\_\_\_ 13. I am easily distracted.
- \_\_\_\_\_ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
- \_\_\_\_\_ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
- \_\_\_\_\_ 16. I have trouble thinking of the right words to express how I feel about things.
- \_\_\_\_\_ 17. I make judgments about whether my thoughts are good or bad.
- \_\_\_\_\_ 18. I find it difficult to stay focused on what's happening in the present.
- \_\_\_\_\_ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
- \_\_\_\_\_ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
- \_\_\_\_\_ 21. In difficult situations, I can pause without immediately reacting.
- \_\_\_\_\_ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
- \_\_\_\_\_ 23. It seems I am "running on automatic" without much awareness of what I'm doing.
- \_\_\_\_\_ 24. When I have distressing thoughts or images, I feel calm soon after.
- \_\_\_\_\_ 25. I tell myself that I shouldn't be thinking the way I'm thinking.
- \_\_\_\_\_ 26. I notice the smells and aromas of things.
- \_\_\_\_\_ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.
- \_\_\_\_\_ 28. I rush through activities without being really attentive to them.
- \_\_\_\_\_ 29. When I have distressing thoughts or images I am able just to notice them without reacting.
- \_\_\_\_\_ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
- \_\_\_\_\_ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
- \_\_\_\_\_ 32. My natural tendency is to put my experiences into words.
- \_\_\_\_\_ 33. When I have distressing thoughts or images, I just notice them and let them go.
- \_\_\_\_\_ 34. I do jobs or tasks automatically without being aware of what I'm doing.
- \_\_\_\_\_ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
- \_\_\_\_\_ 36. I pay attention to how my emotions affect my thoughts and behavior.
- \_\_\_\_\_ 37. I can usually describe how I feel at the moment in considerable detail.
- \_\_\_\_\_ 38. I find myself doing things without paying attention.
- \_\_\_\_\_ 39. I disapprove of myself when I have irrational ideas.

### **Self-Compassion: Self-Compassion Scale**

#### **HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES**

Please read each statement carefully before answering. To the left of each item, indicate how



often you behave in the stated manner, using the following scale:

Almost Never					Almost Always
1	2	3	4	5	

- \_\_\_\_\_ 1. I'm disapproving and judgmental about my own flaws and inadequacies.
- \_\_\_\_\_ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
- \_\_\_\_\_ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
- \_\_\_\_\_ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
- \_\_\_\_\_ 5. I try to be loving towards myself when I'm feeling emotional pain.
- \_\_\_\_\_ 6. When I fail at something important to me I become consumed by feelings of inadequacy.
- \_\_\_\_\_ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.
- \_\_\_\_\_ 8. When times are really difficult, I tend to be tough on myself.
- \_\_\_\_\_ 9. When something upsets me I try to keep my emotions in balance.
- \_\_\_\_\_ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
- \_\_\_\_\_ 11. I'm intolerant and impatient towards those aspects of my personality I don't like.
- \_\_\_\_\_ 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.
- \_\_\_\_\_ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.
- \_\_\_\_\_ 14. When something painful happens I try to take a balanced view of the situation.
- \_\_\_\_\_ 15. I try to see my failings as part of the human condition.
- \_\_\_\_\_ 16. When I see aspects of myself that I don't like, I get down on myself.
- \_\_\_\_\_ 17. When I fail at something important to me I try to keep things in perspective.
- \_\_\_\_\_ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.
- \_\_\_\_\_ 19. I'm kind to myself when I'm experiencing suffering.
- \_\_\_\_\_ 20. When something upsets me I get carried away with my feelings.
- \_\_\_\_\_ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
- \_\_\_\_\_ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.
- \_\_\_\_\_ 23. I'm tolerant of my own flaws and inadequacies.
- \_\_\_\_\_ 24. When something painful happens I tend to blow the incident out of proportion.
- \_\_\_\_\_ 25. When I fail at something that's important to me, I tend to feel alone in my failure.
- \_\_\_\_\_ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

### Self-Control and Self-Management Scale

1. When I work toward something, it gets all my attention.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5
2. I keep focused on tasks I need to do even if I do not like them.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5
3. I become very aware of what I am doing when I am working towards a goal.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5
4. I make sure to track my progress regularly when I am working on a goal.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5
5. I pay close attention to my thoughts when I am working on something hard.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5
6. I know I can track my behavior when working toward a goal.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5
7. When I set important goals for myself, I usually do not achieve them.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5
8. I do not seem capable of making clear plans for most problems that come up in my life.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5
9. The goals I achieve do not mean much to me.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5
10. I have learned that it is useless to make plans.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5
11. The standards I set for myself are unclear and make it hard for me to judge how I am doing on a task.  
**Very Undescriptive of Me** 0 1 2 3 4 **Very Descriptive of Me** 5

12. I congratulate myself when I make some progress.

**Very Undescriptive of Me**                      **Very Descriptive of Me**

0            1            2            3            4            5

13. I get myself through hard things by planning to enjoy myself afterwards.

**Very Undescriptive of Me**                      **Very Descriptive of Me**

0            1            2            3            4            5

14. I silently praise myself even when others do not praise me.

**Very Undescriptive of Me**                      **Very Descriptive of Me**

0            1            2            3            4            5

15. When I do something right, I take time to enjoy the feeling.

**Very Undescriptive of Me**                      **Very Descriptive of Me**

0            1            2            3            4            5

16. I give myself something special when I make some progress.

**Very Undescriptive of Me**                      **Very Descriptive of Me**

0            1            2            3            4            5

**Psychological Stress:  
Depression, Anxiety Stress Scale 21**

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

*The rating scale is as follows:*

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3

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

## APPENDIX C:

### Additional Tables from Study 3

Table C.1

*Moderating effect of trait mindfulness in IBS*

	Low FFMQ-M (1 <sup>st</sup> Tertile)	Moderate FFMQ-M (2 <sup>nd</sup> Tertile)	High FFMQ-M (3 <sup>rd</sup> Tertile)
Pearson's <i>r</i> :			
IBS-SF and IBS-SI	.50**	.39*	.28

*Note.* FFMQ-M: Five Facet Mindfulness Questionnaire, modified (excluding observing sub-scale)

IBS-SF: IBS symptom frequency

IBS-SI: IBS symptom interference

\*\* indicates significance at the .01 level

\* indicates significance at the .05 level

Table C.2

*Bivariate correlations with the FFMQ observing sub-scale*

<i>N</i> = 166	1	2	3	4	5	6
1. Observing	-	.26**	-.15*	-.18**	.42**	.20**
2. Describing		-	.32**	.28**	.32**	-.15*
3. Awareness			-	.56**	.13	-.54**
4. Non-Judging				-	.15*	-.60**
5. Non- Reactivity					-	-.13
6. DASS						-

*Note.* \*\* indicates significance at the .01 level. \* indicates significance at the .05 level.

Table C.3

*Pairwise comparisons between specific indirect effects*

Comparison	Effect	SE	LLCI	ULCI
IBD-SI and SCS	-.019	.053	-.088	.121
IBD-SI and SCSM	-.040	.033	-.107	.022
SCS and SCSM	-.021	.057	-.140	.086

Table C.4

*Serial multiple mediation model 1: Total and specific indirect effects of trait mindfulness on psychological distress through self-compassion, self-regulation, and symptom interference*

	Effect	SE	Bootstrapping 95% CI Lower Upper	
<b>TOTAL Indirect Effect of Model</b>	<b>-.177</b>	<b>.050</b>	<b>-.275</b>	<b>-.080</b>
FFMQ-M → SCS → DASS	-.060	.046	-.160	.026
FFMQ-M → SCSM → DASS	-.026	.018	-.061	.010
FFMQ-M → IBD-SI → DASS	-.026	.031	-.089	.033
FFMQ-M → SCS → SCSM → DASS	-.013	.011	-.039	.004
<b>FFMQ-M → SCS → IBD-SI → DASS</b>	<b>-.047</b>	<b>.024</b>	<b>-.097</b>	<b>-.003</b>
FFMQ-M → SCSM → IBD-SI → DASS	-.003	.009	-.022	.014
FFMQ-M → SCS → SCSM → IBD-SI → DASS	-.002	.005	-.011	.008

*Note.* \*Bold indicates significance