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Kindness Matters

Investigating the mental and physical health benefits of self-compassion in diabetes

Anna Mary Friis

A thesis submitted in fulfilment of the requirements of
Doctor of Philosophy in Health Psychology,
The University of Auckland, 2016
Abstract

Mood disturbances among diabetes patients are both common and problematic, compounding emotional suffering and potentially leading to complications in physical health. Despite high prevalence, however, current treatment options for the management of depression are limited; evidence for psychosocial interventions that concurrently improve both psychological and physiological health metrics is sorely lacking. The work presented in the context of this thesis sought to address this deficit by investigating the mental and physical health benefits of self-compassion in diabetes patients through a series of theoretical, cross-sectional, and experimental studies. The primary aims of this programme of study were to establish: (1) whether self-compassion predicts better mental and physical health outcomes among diabetes patients and, if so, (2) whether a self-compassion intervention improved these outcomes for patients.

The first contribution (Study 1) reviewed the literature pertaining to depression and low mood among diabetes patients and presented a theoretical rationale suggesting that self-compassion is well-suited to the challenges of diabetes self-management, and that enhancing this characteristic should have psychological, behavioural, and physiological benefits. Study 2, a cross-sectional study conducted primarily with Type 1 diabetes patients then tested some of these hypothesized relationships. Analysis showed (1), that diabetes-specific distress was a better predictor of HbA$_1c$ than depression and (2), that self-compassion moderated the link between diabetes-specific distress and HbA$_1c$ such that the link between distress and poorer metabolic outcomes was weakened among those with greater trait self-compassion. In Study 3, the effects of a brief self-compassion induction on mood and motivation to undertake a common health behaviour were tested in a laboratory study.
among healthy participants. While the self-compassion intervention improved mood, results were not consistent with the notion that self-compassion, compared to self-criticism, would positively improve behavioural motivation. Thus, the final study (Study 4), a randomized controlled trial, tested the effects of a more substantial and standardized ‘dose’ of self-compassion training – mindful self-compassion. Analyses showed that the eight-week training intervention improved both psychological and physiological outcomes, with reductions in depression, distress, and HbA1c in the intervention arm; effects were sustained at three months follow-up.

Taken together, these studies are the first to demonstrate that self-compassion both predicts and causes reductions in depression and diabetes-specific distress among diabetes patients while concurrently improving metabolic outcomes. The RCT provides further evidence that self-compassion is a characteristic that can be developed with training. However, while highlighting the relevance of self-compassion to a patient population that often struggles with mood issues and related complications, further work is required to understand the pathways by which benefits might be exerted; effects on behavioural motivations in the laboratory study were not clearly evident. Overall, while self-compassion may be an important clinical aid for assisting patients more effectively cope with the distress of their condition, further work is required to better understand mediating psychological, behavioural, and biological pathways.
Acknowledgements

For there to be compassion there must first be an awareness of suffering. So, my first offer of thanks is to the many people living with diabetes who trusted me with their stories and showed me their sadness. Without them, the idea for the need to bring self-compassion into the clinic room and, ultimately, into the studies reported in these pages, would not have arisen. Thank you also to the Diabetes Clinic at North Shore Hospital for providing practical support for this research, and to the New Zealand Diabetes Foundation and the New Zealand Society for the Study of Diabetes for providing funding. As part of my gratitude to those with first-hand experience of diabetes, I also acknowledge Dr Rick Cutfield, a deeply kind man, an exceptional doctor, and my clinical supervisor.

To my lead academic supervisor, Associate Professor Dr Nathan Consedine, I offer you my heartfelt thanks. The quality (and quantity!) of your contributions to this work has been both generous and remarkable and I know I have been fortunate to have you in this role. You pushed me to places I never thought I could go and yet also gave me space when I needed to draw breath. To my co-supervisor Malcolm Johnson; what a pleasure and a privilege it has been to have you in my life over these years. Your genuine interest, calm demeanour and great depths of knowledge and wisdom have been invaluable and hugely appreciated.

To my health psychology colleagues and mentors, to my dear friends and family, and to my beautiful children Jordan, Lucas and Nic, thank you for your encouragement and willingness to listen – often endlessly – as I tried to work things out.

Finally, to my best friend and husband of 30 years, Wayne Schuler. Thank you for holding ‘us’. Through all of life’s ups and downs, we have each discovered that it is truly only kindness that really matters.

Anna Friis, October, 2016
I dedicate this work to my late uncle, Dr Jeffrey Brendan Friis, a man who knew suffering and compassion in equal measure.
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Awards and Publications Relevant to PhD Candidature

Publications during candidature


Oral presentations during candidature

2014


HbA\textsubscript{1c}. Oral presentation at *Health Psychology Seminar Series*, Department of Psychological Medicine, FMHS, The University of Auckland, N.Z.


**2015**

**Friis, A.M.** (August, 2015). The Power of Self-Compassion: Presentation to *WDHB Clinical Nurse Training Day*, North Shore Hospital, Auckland N.Z.

**Friis, A.M.** (September, 2015). Kindness Matters: Update on RCT research among diabetes patients, *ADHB Diabetes Clinical team*, Greenlane Hospital, Auckland, N.Z.

**Friis, A.M.** (September, 2015). Breathing Underwater: The power of self-compassion: *Seminar for Wellbeing@Work series*, UoA, Auckland, N.Z.

ADHB Seminar Series, Auckland, N.Z.

2016


Awards and grants

University of Auckland Doctoral Scholarship

New Zealand Society for the Study of Diabetes Research Grant

New Zealand Diabetes Research Grant

University of Auckland Post Graduate Travel Grant
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Diabetes Spectrum. DOI: 10.2337/diaspect-29.4.252

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Mary,* 20 years-old with Type 1 diabetes, was scheduled to see me, the intern health psychologist, at 11am one Tuesday back in 2011. At 10 minutes past the hour I checked the waiting room for a second time and concluded she wasn’t coming. This was the third time she had failed to keep her appointment. I called her cellphone to see what had happened and discovered she was sitting in her car in the clinic carpark. She said she couldn’t come in, she was too ‘scared’ and too ‘bad’. So, I went out talk to her in the carpark; what she told me planted the seed that grew into this PhD.

Though she understood her condition and how to manage it well, Mary was decidedly not doing it. Though she was terrified of losing function and dying young, she felt paralysed. She was too scared of what she might discover if she tested, and of how she would cope with poor results. The only thing I had to offer in the carpark was my understanding and compassion, to let her know that she wasn’t alone, that managing diabetes wasn’t easy and that I could see she was struggling. Most importantly, I helped her see that beating herself up with self-criticism was making things worse, and that treating herself in the same kindly way she would naturally support a good friend might help. With the sense of her best friend beside her, she got out of the car and came into the clinic.

*Not her real name
Chapter 1. Overview

1.1 Introduction

Diabetes is a serious global epidemic with devastating physical, psychological, social and economic effects on patients, their families, and communities. On top of the many physical challenges of living with diabetes, emotional problems frequently compound suffering and may exacerbate problems in physical health. However, while mood difficulties are frequently comorbid with diabetes, successfully identifying and treating problems with mood has proved difficult. Few interventions are concurrently successful in improving both physical and mental health outcomes and/or are conceptually suited to the particular difficulties of someone living with diabetes.

Inspired by the clinical experience of working with sad and distressed patients, this thesis represents an investigation into the relevance and potential utility of ‘self-compassion’ to the mood and physical health difficulties in this patient group. While the period of time since 2003 has seen the publication of hundreds of studies of self-compassion, few investigations have been conducted in physical health and, at the time the thesis was initiated, none were evident in diabetes. However, given that the relentless daily demands of good diabetes self-management presents fertile ground for failures and self-criticism (the very opposite of self-compassion), a research programme incorporating theoretical, cross-sectional, experimental, and intervention work was developed and is presented in the following chapters.

To lay the groundwork for this programme of research, the second chapter of the thesis begins by briefly outlining the scale of the diabetes epidemic and the pervasiveness of the mood problems that amplify suffering both psychologically and physiologically. It describes how negative affect is linked to worse self-management and metabolic outcomes before providing an overview of the most commonly-
prescribed interventions for mood difficulties in diabetes patients. Highlighted in this review is the absence of empirically-supported treatments that are not only a good theoretical “fit” with the particular demands confronting this patient population but which have the potential to successfully treat both mental and physical health processes.

Having thus highlighted the limitations and mixed efficacy of current approaches, Chapter 3 provides a rationale for the examination of self-compassion as a treatment option. In beginning this section, the concept of self-compassion is defined as a combination of mindfulness, a sense of one’s common humanity, and the capacity to offer oneself kindness and support during times of suffering. The evidence for self-compassion in improving both mental and physical health outcomes in general is then briefly reviewed before focussing more specifically on likely mechanisms for these effects. These include both behavioural and physiological processes that may be improved by the capacity to direct compassion to oneself. Finally, this chapter reviews evidence by which self-compassion may have the potential to act as a ‘buffer’ against negative mental states, thus offering some form of protection against the flow-on effects of low mood on behavioural and biological outcomes of particular relevance to diabetes patients.

With evidence that self-compassion is a skill that can be trained, there are compelling reasons to suggest the capacity for self-kindness may be especially helpful to a patient group in which opportunities for self-criticism are ever-present. Consequently, Chapter 4 moves the focus from self-compassion in general to providing a specific review, a theoretical rationale, and justification for the expectation that self-compassion might benefit the mental and physical health of diabetes patients via psychological, behavioural, and biological pathways. This rationale is summarized in a
peer-reviewed theoretical commentary titled “Does Kindness Matter: Diabetes, Depression, and Self-Compassion – A selective review and research agenda,” that has been published in Diabetes Spectrum.

Having establishing an overall rationale and framework for examining the possible benefits to self-compassion and self-compassion based therapeutic approaches in diabetes, Chapter 5 reports the results of an initial, cross-sectional study among 110 diabetes patients at the Waitemata District Health Board’s Diabetes Service. In addition to testing questions regarding whether distress or depression better predicted metabolic control in this population, analyses showed the expected pattern in which self-compassion was associated with better mental and physical health and greater self-compassion attenuated the link between diabetes-specific distress on HbA1c, a clinical measure of metabolic health. The report: “Does Kindness Matter? Self-compassion buffers the negative impact of diabetes distress on HbA1c” was previously published in Diabetic Medicine.

After having provided preliminary, albeit cross-sectional, evidence that self-compassion predicts both mental and physical health outcomes among persons with diabetes, Chapter 6 extends the thesis to the laboratory. With data linking self-compassion (as compared to self-criticism) to behavioural motivation, an experimental study was designed to test the possibility that a brief intervention might improve the enacting of a common health behaviour. As a preliminary test of this hypothesis among healthy volunteers, teeth flossing was chosen as a proxy for the kinds of daily self-management tasks generally required of people living with diabetes. The report, “Paradoxical effects of self-compassion on mood and teeth flossing behaviour in an experimental setting” presents the results of this study, previously published in Mindfulness. The study concludes that, while self-compassion improved mood, changes
in affect may not predict improved motivation to undertake health behaviour such as health flossing. Whether or not these data can be extrapolated to the types of activities required for diabetes patients is also discussed.

Although the experimental laboratory data were complex, the combination of the cross-sectional data coupled with the expectation that a larger “dose” of self-compassion is likely needed to affect behaviour in a patient sample, was reflected in the findings from the final empirical study. Chapter 7 reports the results of a randomized trial in which self-compassion was trained in a population of diabetes patients. This trial demonstrated effects of an eight-week self-compassion intervention on both emotional and biological outcomes. Reductions in depression and diabetes-specific distress were recorded at the end of the training period and were maintained at three-month follow up. In addition, the intervention also demonstrated effects on metabolic processes as measured by HbA1c, a notable extension on most prior psychosocial interventions in this patient group. “Kindness Matters: A RCT of a mindful self-compassion intervention improves depression, distress and HbA1c among diabetes patients” was previously published in Diabetes Care.

Finally, Chapter 8 provides a summary of the findings of this doctoral research programme, evaluating these in the context of existing psychosocial interventions for treating mood disorders in diabetes patients. The thesis concludes with suggestions for ongoing research development of this class of intervention.
Chapter 2. The Scope of the Problem

2.1 Introduction

Diabetes was first clinically described by the Greek physician Areteaus of Cappadocia (2nd Century AD) as a “dreadful affliction ... a melting down of the flesh and limbs into urine... life is short, unpleasant and painful, thirst unquenchable ... Patients are affected by nausea, restlessness and burning thirst ... and within a short time they expire” (Savona-Ventura & Mogensen, 2009, p.2).

While the discovery of insulin means diabetes is no longer a death sentence, the disease remains a serious global health problem, estimated to affect 8.5% of adults worldwide (approximately 422 million people), (Global Report on Diabetes, 2016). With prevalence rates escalating rapidly around the world, the World Health Organisation considers diabetes to be one of the foremost public health crises of our time, and likely to be the seventh leading cause of death by 2030 (Global Report on Diabetes).

Medically, diabetes is classified into two main types or categories. ‘Type 1’ is categorised as an autoimmune condition in which the pancreas does not produce the beta cells necessary for insulin production. The condition accounts for about 5 - 10% of cases overall (Rodbard, Blonde, Braithwaite, et al., 2007). By contrast, the majority of diabetes presentations in the 21st century are categorised as ‘Type 2’, a disease category in which lifestyle factors, particularly being overweight, cause cells to become resistant to the insulin necessary for the cellular uptake of glucose, resulting in rising blood sugar levels (Rodbard, et al).

Regardless of type, the consequences of poorly managed diabetes are severe, with micro and macro vascular damage leading to a range of dangerous medical complications. As well as the elevated risk of cardiovascular disease and stroke,
possible complications include progressive development of retinopathy with potential blindness, nephropathy that may lead to renal failure, and/or neuropathy with risk of foot ulcers and amputation (Musselman, Betan, Larsen, et al., 2003; Global Report on Diabetes, 2016). In addition, the presence or progression of diabetes is associated with serious emotional difficulties. Mood disorders are frequently comorbid with the diagnosis (Peyrot, Rubin, Funnel, et al., 2009). Although advances in the medical management of diabetes means patients are generally able to live active and productive lives, it remains a difficult and debilitating chronic condition, ultimately without cure. Many patients are destined to spend decades juggling a complex combination of testing, medication, and lifestyle measures to maximise their health.

2.2 Clinical management

With chronically elevated glucose levels the primary cause of physical morbidity and mortality in diabetes patients, clinical management focuses on careful control of blood sugars to slow the progression of physical complications. For Type 2 patients, treatment is generally progressive, beginning with lifestyle prescriptions and leading to drug therapies involving insulin administration (Rodbard, et al., 2007). For Type 1 patients, constant testing of glucose levels with insulin adjustment to avoid hypo- or hyper-glycemia is the only way to avoid catastrophic illness and death (Ingersoll & Cohen, 2008).

The accepted measure of glycaemic control is glycated haemoglobin (HbA1c) which reflects glycaemic indices over the previous eight to twelve weeks (Chiodini, et al., 2007). While individuals without diabetes typically have HbA1c levels ranging from 3% to 6.5%, the metabolic goal for people diagnosed with diabetes is around 6.5%, as adjusted by age, history and health status (Holman, Paul, Bethel, et al., 2008). This is a crucial treatment goal with studies showing that each 1% reduction in hyperglycemia
(as measured by HbA1c) corresponds to a reduction of between 14–37% in the risk of serious diabetes-related complications (Holman, et al.). Long-term risks of myocardial infarction and death are also reduced with reductions in blood glucose (Holman, et al; Nathan, Buse, Davidson, et al., 2009; Gross & Reibel, 2014).

Diabetes self-management education (DSME) is, therefore, critical to patient health. Patients must be educated such that they understand the importance of adherence to diet, exercise and medication prescriptions. In addition, patients must be trained to monitor blood glucose - often many times per day - as well as to interpret and use these results for self-management decisions, typically involving the administration of insulin to keep blood glucose optimal. Regular clinic visits in which individual care plans and clinical results can be reviewed and adjusted by medical teams are part and parcel of living with diabetes (Haas, et al., 2013).

However, consistently achieving near-to-normal blood glucose is difficult, requiring concerted and sustained self-management efforts. Estimates are that the average patient taking oral hypoglycemic medication needs to spend approximately two hours per day to meet the American Diabetes Association recommended guidelines for self-care (Hirsch, et al., 2008). While the intent of DSME is that patients receive the support that meets their needs, this is not always the case. Patients frequently report high distress and frustration as well as feelings of being misunderstood and judged regarding their diabetes management (Fisher, Mullan, Arean, et al., 2010; Carbone, Rosal, Torres, et al., 2007).

In some instances, clinical care teams may compound patient difficulties with self-management goals, with evidence of an apparent ‘disconnect’ between practitioners and patients in terms of treatment priorities and quality of life. For example, one study suggests that practitioners were of the opinion that patients could
live “normal lives” with the disease and communicated this belief to their patients. Patients, on the other hand, did not agree, instead believing that the considerable effort and planning required to maintain good diabetes health was in fact counter to living a normal life (Carbone, et al., 2007). Furthermore, patients express frustration with not being able to ‘produce’ expected outcomes even when they are compliant with diet, exercise and medication (Carbone, et al., 2007; Wilkinson, Whitehead, & Ritchie, 2014).

For many patients, good metabolic control is not only a complex and demanding pursuit in which getting it “right” is difficult, but is also one in which there exist multiple opportunities to experience failure as a consequence of less-than-ideal self-management or sub-optimal metabolic results (Garber, Abrahamson, Barzilay, et al., 2013).

2.3 Mood difficulties common

So, in addition to the challenges of good metabolic management, many patients cope with the additional problems of low mood. Emotional disturbances have been documented in relation to diabetes at least since 17th century British physician Thomas Willis first documented a link between the disease and “life stresses or sadness” (Moulton, Pickup & Ismail, 2015). However, more recently, subtle differentiation among the various emotional issues associated with diabetes has been attempted in order to better understand the range of presentations and their effects on disease management; sub-clinical depressive symptoms, depression, and diabetes-specific distress are now each recognised as being common (and potentially distinct) among patients (Snoek, et al., 2015).

The following section briefly considers the basis and possible advantages of considering depression and diabetes-specific distress as separate, although related, constructs. Although both may incorporate negative views of the self and one’s
diabetes self-management, it is nonetheless possible that the two constructs have differential utility in predicting metabolic management issues.

2.3.1 Depression and sub-clinical depression

Depression and sub-clinical depressive symptoms are at least twice as common in diabetes patients as they are in the general population (Roy & Lloyd, 2012). Studies show approximately 30–40% of patients with diabetes report elevated depressive symptoms, with 10–15% of patients then diagnosed with a depressive disorder according to standardized clinical criteria (Anderson, Freedland, Clouse, & Lustman, 2001; Peyrot, & Rubin, 1997). More recent work suggests that the prevalence of depression among diabetes patients may rise to as high as 31% when assessed using self-report questionnaires although, worryingly, only half (51%) of these individuals are recognized as being depressed by health care providers (Tiwari, et al., 2015). While depression may be a seriously under-diagnosed co-morbidity of diabetes (Katon, et al., 2004), it is one which is nonetheless consistently linked to the risk of poor self-management and metabolic complications, compounding patient burden in several ways.

Firstly, the motivation to maintain essential self-care behaviours and adhere to medications such as oral hypoglycemic and lipid-lowering medications often suffers when emotional problems occur (Katon, 1997, Ciechanowski, et al., 2000, Egede, et al., 2002, Snoek, et al., 2015). Evidence shows the relationship between depression and worse metabolic outcomes may be mediated by worse self-management behaviour, including decreased adherence to medication regimes, physical inactivity, imbalanced diets and irregular glucose monitoring (Egede, 2005). For example, in a large population of primary care patients with diabetes, co-existing depression was consistently related to greater smoking, lack of exercise and unhealthy eating, as well
as lower adherence to oral medications (Lin, Katon, Korff, Rutter, Simon, Oliver, et al., 2004). Depressed patients used approximately 20 fewer days of hypoglycemic agents in the prior year than non-depressed patients (Lin, et al., 2004). The effect of depression on health behaviour is important insofar as optimal glycemic control and favourable health outcomes cannot be achieved with low adherence to hypoglycemic regimens.

Secondly, the self-judgement and self-criticism that characterise depression may be at the heart of diabetes mood problems, many of which are typified by feelings of inadequacy and hopelessness (Longe, Maratos, Gilbert, Evans, Vopker, Rockliff, et al., 2010; Joeng & Turner, 2015). For diabetes patients, negative evaluations such as ‘I’m not taking care of myself well enough’, ‘I can’t do this’, or ‘I can’t cope’, may create a negative cycle of self-judgement leading to despair, helplessness, and further reductions in the motivation to maintain adherence (e.g., ‘what’s the point anyway’). Poor metabolic control as a result of poor compliance to lifestyle and medications then likely provides further ‘evidence’ for additional negative self-evaluations and self-criticism (Joeng & Turner, 2015), thus continuing a mutually-reinforcing cycle of negative mood and poor disease management.

Thirdly, by creating and sustaining self-critical views of one’s diabetes self-management and of one’s self, negative cognitions may represent a form of “attack” or threat, simulating internal stress responses similar to those activated by threats from an external source (Gilbert, et al., 2007). Internal attacks not only compound emotional difficulties but, for diabetes patients, may affect metabolic control through the biological processes associated with hypothalamic-pituitary-adrenal (HPA), autonomic, and inflammatory processes (Taabak Akbaraly, Barry, et al., 2014). While evidence for the inflammatory and HPA processes associated with depression as precursors to the
development of diabetes is still emerging, it seems clear that diabetes-related biological processes are themselves affected by negative emotions (Moulton, et al., 2015). It is known, for example, that psychological stress is accompanied by the release of counter-regulatory hormones (i.e. catecholamines, glucocorticoids, growth hormone and glucagon) that may increase blood glucose (Sapolsky, Romero, & Munck, 2000). Hence, internally created threats and emotional difficulties such as those characterised by self-criticism not only make metabolic control motivationally more difficult, but may also pre-dispose diabetes patients to depression as a result of a stress responses “gone awry” (Mussleman, et al., 2003)

2.3.2 Diabetes-specific distress

Unlike the more generalized cognitive, behavioural and physiological elements characterising depression, diabetes distress – occurring in up to 30% of patients – refers to a constellation of psychological and affective concerns specific to diabetes self-management, support, emotional burden, and access to care (Snoek, et al., 2015). Studies suggest diabetes-specific distress may predict complications in a manner similar to depression yet may be experientially distinct. Such distinctions are important insofar as patients may not present or screen as depressed, but nonetheless have feelings of being overwhelmed and concerned about diabetes self-management in ways that continue to affect metabolic control and add to the psychological burden of the disease (Fisher, et al., 2008; 2010).

Hence, although they are experientially different, both depression and diabetes distress are linked to poorer glycaemic control, increased risk of complications, and diminished quality of life (Mussleman, et al., 2003; Herr, Pouwer, Holt, & Loebroks, 2013; Roy, & Lloyd, 2012; Linetzky, Jiang, Funnell, et al., 2016). Although research is ongoing, early evidence suggests that distress may, in fact, be more strongly correlated
to glycemic outcomes than depression per se (Fisher, et al., 2008; 2014; Anderson, et al., 2001). For example, a study among 506 adults with Type 2 diabetes showed diabetes distress was not only more prevalent and with a higher incidence than depression, but was also the stronger predictor of metabolic outcomes in both cross-sectional and longitudinal analyses (Fisher et al., 2010). This problem is considered more fully in Chapter 5.

Overall, while measurement difficulties may be important, it is clear both depression and distress are common and predict metabolic and self-management difficulties through many, likely interconnected, processes. Firstly, evidence strongly links low mood and distress to poor behavioural adherence to prescribed medication and lifestyle regimens. Secondly, the subsequent experience of “failure” as a result of less-than-ideal outcomes is likely to then sets up further targets for self-criticism and subsequent emotional suffering. Thirdly, this ‘vicious cycle’ of negative thinking and low mood may affect the diabetes-related biological processes governing metabolic control (Snoek, et al., 2015). Taken together, problems with low mood add a potentially devastating complication for patients living with an already difficult disease. Only relatively recently have interventions to treat emotional difficulties in this patient population been the subject of serious research interest, with the evidence to date suggesting that there is still much work to be done. The following section provides a brief overview of the status quo.

2.4 Current interventions to improve mood in diabetes

While the previous section outlined the complexity of low mood presentations and the effects of these on the physical health of patients, the following section briefly reviews the most commonly-prescribed interventions used to treat mood difficulties co-morbid with diabetes. These interventions include psychopharmacology, psychosocial
interventions, and, increasingly, so-called ‘third wave’ treatments involving training in mindfulness and acceptance. While a relatively large numbers of studies have investigated the effects of these interventions, there are clear difficulties with interpretation due to an ongoing pattern of inconsistent findings and considerable heterogeneity in the type and length of intervention and methodologies employed. In addition, the fact that most reported studies have investigated the effects of a psychological intervention in combination with another supportive therapy such as self-management education or psychopharmacology means it is often difficult to tease apart the contribution of the psychological intervention itself.

Overall, it is suggested that there remains a need to continue the search for practical and efficacious alternatives that more directly target the specific issues faced by diabetes patients, which may lie at the core of mood problems more generally. Furthermore, a greater understanding of the sustainability of interventions offered to patients as measured by adequate follow-up data on both psychological and physiological metrics may be an important next step.

2.4.1 Psychopharmacological interventions

While antidepressant medications are typically a first port of call in the medical management of mood problems, estimates are that only around one third (31%) of diabetes patients who receive a diagnosis of depression subsequently receive an adequate pharmacotherapeutic dose (Katon, Von Korff, Lin, et al., 2004). Evidence that antidepressant medications reduce depression is reported in a meta-analysis of 12 intervention trials, with an overall standardized mean difference (SMD) of -0.61, representing a moderate effect on mood outcomes (Beaumeister, Hutter, & Bengel, 2012). Likewise, the meta-analysis of effects of antidepressant medication on glycaemic control demonstrated an overall small-to-moderate effect of -0.38 (SMD)
(Baumeister, et al.). It is not clear from the research, however, if gains are maintained over time or whether patients decline or continue to improve in both the remission of depression symptoms and/or improvements in HbA1c with only short-term (end of treatment) data reported across all studies (Beaumeister, et al.).

Sounding a further note of caution, recent evidence suggests that the use of antidepressants in depressed patients may be associated with an increased risk of the subsequent development of Type 2 diabetes, either through direct metabolic processes, as a consequence of weight gain, sedentariness and poor diet, or because of third variables (Petrak, Baumeisier, Skinner, et al., 2015). Antidepressant medications, independently of depression itself, may be etiologically significant in the association between depression and Type 2 diabetes via so-called diabetogenic metabolic pathways (Kivimaki, Hamer, Batty, et al., 2010). Such data imply that while antidepressant medication may reduce the severity of depression in diabetes, the effects of the medication itself on endocrine and inflammatory processes are not yet fully understood, warranting both caution and further investigation (Petrak, et al., 2015). Hence, while pharmacological intervention remains the “frontline” treatment for most patients with severe depression, the fact that its efficacy remains unclear and with as yet unknown implications for disease processes, possible side effects, and drug-drug interactions (Snoek, et al., 2015) means there is a clear need for ongoing research into non-medical alternatives or supplementary interventions.

2.4.2 Psychosocial treatments

Psychosocial interventions such as cognitive-behavioural therapy (CBT), counselling, interpersonal therapy, problem-solving or brief psychodynamic psychotherapy, typically include some form of talk therapy designed to reduce depression; interventions may occur in tandem or independently of pharmaco-management.
Of the psychological interventions, CBT, a structured and often manualised approach targeting dysfunctional cognitions and behaviours, is the current “gold standard” treatment with protocols specifically developed to target areas likely to interfere with good diabetes self-management (Markowitz, Gonzalez, Wilkinson & Safren, 2011). For example, CBT directly targets the negative thinking associated with depression (e.g., ‘I can’t do anything about my diabetes’, ‘what’s the point in trying?’), which may lead to a lack of motivation and further struggles with self-care. The resulting decline in self-management then leads to worse physical symptoms, thus precipitating further negative thinking because one’s illness is worse (Markowitz, 2011; Hermanns, Schmitt, Gahr, et al., 2015). In addition to targeting dysfunctional thinking, CBT protocols are especially developed to target specific behavioural barriers such as fear of needles or hypoglycaemia, which can interfere with adherence and self-care (Rosello & Jimenz-Chaffey, 2006).

While design flaws, including a wide variation in terms of dose and method of delivery (face-to-face, telephone, internet-based), make overall outcomes of psychological therapies difficult to interpret, there is evidence that CBT slightly improves mood and glycaemic control in depressed patients with diabetes (Petrak, 2015). The sustainability of these effects cannot yet be ascertained with mainly short term (end-of-treatment) results reported for depression outcomes and glycaemic control. Studies reporting medium term (1 to six months after the end-of-treatment) or long term (more than six months after the end-of-treatment) effects are sparse (for review, see Beaumeister, Hutter, & Bengel, 2012; Petrak, 2015).

Furthermore, despite some evidence of benefit, the CBT-based approach is not without its risk, particularly in a population already burdened by multiple areas of perceived “failure”. In labelling the cognitive processes of depressed diabetes patients
“faulty,” the CBT approach may impose the burden of having another dysfunction to be managed. This occurs in the midst of an already onerous self-management regime. Specifically, CBT treatment’s requirement to notice and modify thoughts and beliefs may represent ongoing reminders of one’s ‘failures’, meaning the very nature of CBT may limit its utility and acceptability for patients with diabetes whose sense of agency is limited through living with an already complicated regime (Musselman, et al., 2003).

Overall, current psychological and pharmacological interventions have been shown to have moderate effects in reducing depression in people with diabetes. Antidepressant medications have demonstrated small-to-moderate effects on improved glycemic control, as has CBT generally when combined with diabetes education. That said, complications and possible side effects of pharmacological treatments, and insufficient evidence for acceptability and long term sustainability of psychological interventions such as CBT, mean further research into effective treatment options that improve both mental and physical health outcomes for depressed patients with diabetes is needed. Of increasing interest among this population, and offering a contrast to CBT approaches per se, are interventions applying mindfulness and acceptance skills (for example, Tovote, Fleer, Snippe, et., 2014; Van Son, Nyklíček, Pop, et al., 2013; Gregg, Callahan, Hayes, & Glenn-Lawson, 2007). As is discussed more fully below, these studies draw on the large body of evidence detailing the utility and potential of so-called “third wave” interventions in the general population, and increasingly among other chronically ill patient groups (Grossman, Niemann, Schmidt, & Walach, 2003; Gross & Reibel, 2014). Taken together, there is early evidence to suggest these types of approaches may have potential to improve a range of outcomes of direct relevance to diabetes patients.
2.5  Time for the third wave?

Since first being used to help patients living with chronic pain (Kabat-Zinn, 2003), third wave approaches to treating mood problems such as those based on mindfulness and acceptance have rapidly gained popularity. The following section briefly characterizes and defines mindfulness-based interventions (MBIs) before summarising the evidence for their efficacy in general. Attention is given to the different types of outcomes and populations in which benefits have been observed, noting effects on both psychological and physical processes. To follow, the emerging evidence for the possible utility of MBIs among diabetes patients in particular is reviewed. Important gaps in knowledge, particularly regarding any possible physiological or metabolic benefit are considered. Building on what is currently known about MBIs and, as importantly, what seems to be missing from the evidence to date, this section lays the foundation for a series of empirical investigations into the effects associated with greater self-compassion, a construct that may represent the ‘beating heart’ of mindfulness interventions.

2.5.1  Mindfulness-based interventions and health outcomes

Although the tradition of mindfulness goes back at least 2500 years (Gunaratana, 1993) modern standardized interventions to train people in these techniques have been developed only in the last thirty years, and include many methods for teaching mindful awareness. Of these, Mindfulness Based Stress Reduction (MBSR) (Kabat Zinn, 2003), is the most well-known. It is an eight-week programme which teaches formal meditation practices in which participants learn to meditate by sitting quietly for up to 45 minutes while directing their attention in specific ways. The original aim of MBSR (now widely used in both medically healthy and unwell groups) was to help patients better adjust to the stressors of living with a long-term condition through the development of mindful acceptance of their present-moment emotional and physical state. In theory, mindfulness training may help patients experience pain or discomfort with an attitude
of openness, curiosity, and acceptance, without constant attempts to change, suppress, or elaborate on thoughts or feelings (Kabat-Zinn).

Other subsequently developed mindfulness-based interventions share the same basic eight-week programme structure but have been adapted for specific populations or outcomes. For example, Mindfulness Based Cognitive Therapy (MBCT) (Teasdale, Segal, Williams, et al., 2000) is - as the name suggests - an amalgam of mindfulness training with cognitive therapy and focuses on treating depression (for a review, see Dimidjian & Segal, 2015). Other therapies that incorporate mindfulness such as Dialetical Behavioral Therapy (DBT) and Acceptance and Commitment Therapy (ACT) involve shorter and fewer formal exercises in which components of mindfulness training are practised alongside other techniques (Baer, 2015). The aim of ACT is to create greater psychological flexibility as part of helping individuals come into fuller contact with their experience, to recognise their values, and to commit to behaviours that are consistent with those values (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). As with ACT, DBT has a focus on acceptance combined with behaviour change strategies designed to help patients improve their ability to regulate emotion, and integrates elements of CBT with Zen philosophy and practice (Linehan, 1993; Robins, 2003). Finally, and in addition to the more traditional MBIs discussed above, there has been a dramatic increase in internet and smartphone-based mindfulness programmes in recent years designed to teach people mindfulness skills in their own homes (Creswell, 2017).

Common to all MBIs, however, is an intention to develop metacognitive skills involving the self-regulation of attention as well as the adoption of a particular orientation toward one’s experiences (Bishop, Lau, Shapiro, et al., 2004). In theory, therefore, such developments enable people to relate to experiences, including those
that are painful and difficult, in a clear and balanced manner and with an attitude of non-judgment, curiosity and non-resistance. The following section briefly reviews the evidence for mindfulness-based interventions (MBIs), predominantly in the context of studies investigating effects of MBSR and MBCT, a class of intervention in which training in mindfulness is the primary focus and for which the evidence base is now reasonably robust (for review, see Creswell, 2017). While there is some evidence that incorporating mindfulness training as part of a broader intervention (such as ACT and DBT) may be of benefit, the evidence is more limited (for review, see Hayes, et al., 2011).

A large body of evidence from numerous RCTs shows mindfulness-based interventions (MBIs) improve a range of mental health outcomes, particularly stress-related disorders such as anxiety and depression symptoms (Bohlmeijer, Prenger, Taal, & Cuijpers, 2010, Gross & Reibel, 2014). Several reviews and meta-analyses show the effects on these outcomes at pre- and post-measurements points, with gains generally maintained at follow-up (for reviews, see Gotink, Chu, Bussbach, et al., 2015; Bawa, Mercer, Atherton, et al., 2015; Khoury, Lecomt, Fortin, et al., 2013). Relative to other “active” treatments such as psycho-education, supportive therapy, relaxation, imagery or art-therapy, effect sizes were small to moderate, suggesting the superiority of the MBI (Khoury, et al., 2013). However when compared to traditional CBT or pharmocotherapy, MBIs were no more effective (Khoury, et al.).

Several RCTs have further demonstrated that MBIs reduce the risk of depression relapse compared to usual care or wait-list control (Creswell, 2017; Gotink et al., 2015; Strauss, Cavanagh, Oliver, & Pettman, 2014; Teasdale, et al., 2000; Kuyken, Hayes, Barrett, et al., 2015). There are, however, emerging signs of exceptions to the benefits of mindfulness vis-à-vis depression or, at least, the probability of relapse. A recent RCT
comparing the effects of MBCT versus MBCT combined with maintenance antidepressants among adults with recurrent depression in remission, showed that the risk of relapse increased at 15 month follow-up for those in the mindfulness training alone condition (i.e., without concurrent antidepressant treatment) (Huijbers, Spinhoven, Spijker, et al., 2016).

While studies of MBIs among diabetes patients are reviewed in detail below, evidence for MBIs among other medically unwell groups includes persons diagnosed with irritable bowel syndrome (Garland, Gaylord, Palsson, et al., 2012), chronic pain (for example, Garland, Manusov, Froeliger, et al., 2014; Cherkin, Sherman, Balderson & Cook, 2016), cancer (Carlson, Doll, Stephen, et al., 2013) and human immune deficiency virus (HIV)/acquired immune deficiency syndrome (AIDS) (Gonzalez-Garcia, Ferrer, Borras, et al., 2013). Results consistently show MBIs improve a range of outcomes in patient groups, including self-reported pain (Cherkin, et al.), stress (Davis, Zautra, Wolf, Tennen, & Young, 2015) and reported illness symptoms (Schmidt, Grossman, Schwarzer, Jena, Naumann, & Walach, 2011; Gross & Reibel, 2014; Creswell, 2017).

Although evidence for effects of mindfulness training on physical health outcomes in chronically unwell patient groups is sparse compared to the documented mental health benefits, some overall effects on physiological stress markers (a possible physical health proxy) have been noted (see Gotink, et al., 2015 for an overview of systematic reviews and meta-analyses of mindfulness-based RCTs). For example, several small RCTs show that MBIs may reduce pro-inflammatory immune markers among highly-stressed adults with HIV (for review, see Riley & Kalichman, 2015). Similarly, a MBI among patients with fibromyalgia, employing a within-subjects design, showed mindfulness training improved blood pressure, heart rate, respiration rate, and oxygen consumption (Lush, Salmon, Floy, Studts, Weissbecker, & Sephton, 2009).
These findings are consistent with other studies implying benefits in objective physical outcomes among non-patient groups. For example, one study has shown a correlation between morning cortisol and length of practice among experienced mindfulness meditators, with morning cortisol decreasing with length of experience (Brand, Holsboer-Traschsler, Narango, & Schmidt, 2012). The same study also found a beneficial pre-post decrease in cortisol among novices following an eight-week MBSR training. Another study showed participants in a MBI for cancer patients improved more over time in stress symptoms compared to either supportive therapy or stress management control conditions (Carlson, et al., 2013).

Hence, while the evidence for a possible “stress-buffering” hypothesis (Creswell, et al., 2017) must be described as being in its infancy, work to date does suggest the potential utility of mindfulness-based interventions in reducing both physical symptoms and psychological distress among patients living with stressful chronic illnesses, such as diabetes, and among whom depression is common (Gross & Reibel, 2014).

2.5.1.1 Mindfulness based interventions among diabetes patients

There are several reasons to expect that MBIs should also produce mental and/or physical health benefits among diabetes patients. First, mindful attention is hypothesized to both help reduce the emotional burden of disease as well as facilitate improved metabolic outcomes as a consequence of improved self-management (Gross & Reibel, 2014). It may be, for example, that patients are better able to choose or enact behaviours (i.e., regular blood glucose testing, insulin administration, diet, or exercise) that are consistent with their knowledge and values, as opposed to reacting automatically and relying on unhealthy habits (Whitebird, Kreitzer, & O’Connor, 2009).
Second, early evidence shows MBIs are effective in improving mental health among diabetes patients with outcomes including reduced depression, anxiety, and distress across several studies (see review, Noordali et al., 2015). Of particular note, two of the largest controlled studies have recorded improvements in psychological outcomes (Tovote, et al., 2014; Van Son, et al., 2013). Specifically, a RCT of MBCT relative to usual care among 139 patients with diabetes (type 1 or type 2) and low emotional well-being found MBCT reduced stress, depressive symptoms, and anxiety between pre-post assessments, relative to a waitlist control, although there was no effect on diabetes-specific distress (Van Son, et al., 2013). A further study, however, which tested the effects of individual MBCT compared to CBT or a waitlist control among 94 outpatients with diabetes and comorbid depressive symptoms found both active interventions improved self-reported depression, anxiety, well-being and diabetes-related distress (Tovote, et al, 2014). Whether there is an advantage to mindfulness over and above CBT training is currently unclear.

Most evidence to date does, however, describe self-reported outcomes while evidence for effects of MBIs on physiological outcomes among diabetes patients remains sparse. A small, prospective study \((n = 14)\) found effects on HbA\(_{1c}\) at one month post-completion of MBSR training, although effects on depression, anxiety and stress noted at the completion of the training were no longer significant (Rosenzweig, Reibel, Greeson, & Edman, 2007). Only one published RCT (Gregg, et al., 2009) has reported improvements in HbA\(_{1c}\) values 3 months after a one-day workshop in acceptance-based coping skills as a way of helping patients cope with their diabetes management. Both intervention and control groups also received self-management education. Analyses showed that improved HbA\(_{1c}\) was mediated by changes in acceptance coping as well as improvements in self-care regimens.
Subsequent interventional studies have, however, failed to find effects on HbA1c, although psychological outcomes usually improve. For example, there were no effects on metabolic outcomes from either of the larger intervention trials described above (Van Son, et al., 2013; Tovote, et al., 2014). MBCT relative to usual care found no pre-post effects on HbA1c (Van Son, et al.). Similarly, individual MBCT compared to CBT and a waitlist control reported no effects on markers of metabolic health (Tovote, et al.).

So, while MBIs among diabetes patients tend to improve psychological metrics, studies to date have found no evidence for mindfulness interventions that concurrently improve both physiological and mental health outcomes (Noordali, et al., 2015). That said, most reviewed studies assessed only short term outcomes (immediately post-treatment) and lack follow-up of medium or longer term outcomes, with these methodological limitations making it difficult to draw strong inferences as to the sustainability of the effects of MBIs in this patient population (Noordali, et al.).

2.5.2 Making kindness explicit

Emerging from the intense research interest in MBIs has been a search for possible mechanisms and mediators of effects. Some evidence suggests that factors other than changes in mindfulness itself may account for the effects seen to date. For example, while the findings from a recent meta-analysis indicate a moderate positive effect for MBIs on increasing self-reported mindfulness overall, about 50% of mindfulness interventions fail to result in pre-post changes in self-reported mindfulness (Visted, Vollestad, Nielsen, & Nielsen, 2015). This may reflect the fact that over half of the trials included in the meta-analysis were uncontrolled (or involved very small samples), meaning they were insufficiently powered to detect potential effects of treatment (Visted et al.).
Furthermore, there is limited evidence that mindfulness interventions increase self-reported mindfulness more so than active comparison treatments such as concentration exercises (Kingston, Dooley, Bates, Lawlor, & Malone, 2007; Ortner, Kilner, & Zelazo, 2007; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008) or relaxation (Schmidt, et al., 2011). While it is possible that increased concentration ability and increased awareness of physical sensations as a result of relaxation training are key features of mindfulness itself, these results suggest the intriguing possibility that the benefits of MBIs may arise as a result of factors other than increased mindfulness.

Consistent with the hypothesis that the mechanism for these effects may be something other - or in addition to - changes in mindfulness per se, preliminary evidence shows that improvements in psychological outcomes may be explained by increases in self-compassion and psychological flexibility (Kuyken, et al, 2010; Gu, Strauss, Bond, & Cavanagh, 2015). The suggestion that increases in self-compassion may explain improved outcomes following training in mindfulness raises the possibility that directly training self-compassion more explicitly may have utility. For diabetes patients who live with near constant opportunities to fail or disappoint as a consequence of difficulty meeting self-management demands, self-compassion training may contribute to the alleviation of suffering through the cultivation of a kinder and more accepting view of oneself and one’s experience (Van Dam, Sheppard, Forsyth, & Earleywine, 2010). In theory, caring for one’s needs in this way may not only reduce suffering as a result of self-criticism, but may have important implications for improved diabetes self-management as a consequence of the desire to reduce one’s suffering longer term.
In summary, while early evidence for the benefits of MBIs among diabetes patients show some promise, with consistent improvements demonstrated in mental health in particular, there are important gaps to be considered. Firstly, few studies have found effects on physiological outcomes and no studies have reported both mental and physical health effects (Noordali, et al., 2015). Secondly, only a small number of studies have included adequate follow-up timelines and none have demonstrated sustained effects on physiological outcomes. For example, while Van Son, et al., (2014) and Tovote, et al., (2015) reported long-term effects of a MBI on psychological metrics, neither study reported either short or long-term physiological effects. Extended follow-ups are important to assessing the sustainability of effects of MBIs and the longer term effect among people living with diabetes, particularly physiological outcomes such as HbA1c. Thirdly, the finding that an increased capacity for mindfulness may not be a necessary pre-condition for the outcomes seen in MBIs to date, creates intriguing possibilities for future research (Gu, et al., 2015; Zessin, Dickhauser & Garbade, 2015). Specifically, it means that identifying other potential mechanisms, such as self-compassion, may help explain improvements associated with MBIs. Equally, training in these capacities directly may offer benefits over and above those found with mindfulness-based therapies alone.

Thus, with emerging suggestions from the literature that self-compassion may be among the potential mediators for the effects of MBIs, and with its apparent “fit” to a patient group whose lives are steeped in opportunities for self-criticism, the following chapter narrows the focus of this thesis to a review of the potential health benefits of being kind to oneself. In doing so, a rationale is provided for the subsequent empirical investigation of the utility of self-compassion in improving mental and physical health outcomes for diabetes patients.
3.1 Introduction

As was briefly noted in the preceding chapter, one mechanism that has been suggested as potentially underlying the beneficial effects of mindfulness training is an increased capacity for self-compassion. Growing evidence suggests that explicitly developing feelings of kindness and compassion towards oneself can improve psychological and physical health (Zessin, Dickhauser, Garbade, 2015; Neff & Constigan, 2014; Germer & Neff, 2013). For a patient population in which the perception of having “failed” to achieve ideal self-management standards is both common and likely to elicit particularly painful feelings, meeting that inevitable suffering with kindness and understanding may be of benefit. This chapter briefly defines self-compassion and differentiates it from mindfulness before reviewing evidence for the mental and physical effects of self-compassion more generally in order to establish a rationale for its possible utility in improving outcomes for people living with diabetes.

3.2 Self-compassion: A characterization

Self-compassion is generally seen as an embodiment of three basic components: 1) extending kindness and understanding to oneself rather than responding with harsh self-criticism and judgment; 2) seeing one’s experiences as part of the larger human experience rather than as being separating and isolating; 3) holding one’s painful thoughts and feelings in balanced awareness rather than over-identifying with them (Neff, 2016). While each aspect tends to overlap the others, they are also experienced differently and are conceptually distinct:

For instance, the accepting, detached stance of mindfulness lessens self-judgment. Conversely, if one stops judging and berating oneself long enough to experience a degree of self-kindness, the impact of negative motivational experiences will be lessened, making it easier to maintain balanced awareness of thoughts and emotions. Similarly, realizing that suffering and personal
failures are shared with others lessens the degree of blame and harsh judgment placed on oneself, just as a lessening of self-judgment can soften feelings of uniqueness and isolation (Neff, 2003, p. 234).

So, while the foundation of self-compassion is mindfulness, a crucial difference may be the addition of the specific recognition of one’s common humanity, as well as the active and conscious practice of treating oneself with kindness; these qualities are not inherently part of mindfulness per se (Neff, 2003; Bishop, Lau, Shapiro, et al., 2004). Furthermore, while mindfulness is a way relating to internal experience, self-compassion is a way of relating to the experiencer who is suffering (Germer, 2009).

Furthermore, while mindfulness training emphasises the non-judgmental acceptance of all thoughts, emotions, and sensations that arise in present-moment awareness, self-compassion cultivates the understanding and capacity to tend to one’s suffering with kindness and understanding.

If I am mindful of a stabbing sensation in my knee, for instance, it means I am aware of the hot pulsating sensation without judgment or resistance, allowing mental space for the sensation to “be” as it is. When self-compassion also arises in response to that pain, feelings of care and concern for the fact that I am experiencing this pain are conveyed, along with the motivation to soothe and comfort myself to the extent possible. Self-compassion involves a bit of a paradox, therefore. At the same time that one’s present moment experience is mindfully accepted without resistance, the wish for the experiencer to be free of suffering in future moments - the motivation that lies at the heart of compassion - is also present (Neff & Dahm, 2014, p. 21).

### 3.3 Self-compassion as a protective resource

Although it has only been systematically studied since 2006, a relatively large research base now shows that reporting greater feelings of kindness, inter-connectedness with others, and a balanced and equanimous viewpoint (i.e., self-compassion) is related to many facets of psychological wellbeing, particularly to greater positive emotionality and less negative emotionality (see reviews, Barnard & Curry, 2011; MacBeth & Gumley, 2012; Zessin, et al., 2015). There is also emerging evidence that the capacity to
self-soothe as a consequence of greater self-compassion may also be linked to markers of physical health (Terry & Leary, 2013; Sirois, 2014; Sirois, Kitner, & Hirsch, 2015). The following section briefly reviews the evidence linking self-compassion to outcomes to date, noting the increased research attention for its utility as a protective resource against the negative effect of depression and low mood.

First, self-compassion has been reliably linked to better mood, with reports of greater self-compassion being consistently linked to less anxiety and depression. A strong, negative relationship between self-compassion and psychopathology is reported in a meta-analysis of 20, mainly cross-sectional, studies on the topic ($r = -0.54$), (MacBeth & Gumley, 2012). These findings are consistent with a more recent meta-analysis of nearly 80 studies (Zessin, et al., 2015) linking greater self-kindness with higher scores on measures of well-being ($r = 0.47$), including greater positive emotion and lower negative emotionality. As will be discussed more fully below, most included studies are cross-sectional, meaning causality cannot be assumed.

Self-compassion may also function as a protective resource against negative mental states (e.g., Trompetter, Kleine, & Bohlmeijer, 2016). Notably, while a lack of self-criticism is a key feature of self-compassion (and self-criticism predicts both anxiety and depression (Blatt, 1995), evidence suggests self-compassion predicts lower anxiety and depression even after controlling for self-criticism (Neff, Kirkpatrick, & Rude, 2007). Consistent with the idea that self-compassion is not just the presence of positive emotion, one study found that self-compassion partially mediated the negative association between positive mental health and psychopathology, with participants higher in positive emotionality and self-compassion seemingly protected against negative mood states (Trompetter, et al.). One explanation for this finding is that
individuals higher in self-compassion are not only higher in positive affective states but they may also be better at regulating negative emotions in the face of difficult feelings and circumstances. In theory, more self-compassionate individuals may manifest better emotional regulation through qualities of mindfulness (i.e., not trying to repress or avoid painful feelings as they arise but being open to these with equanimity), as well as possessing a greater capacity to experience their own support, care, and kindness (Neff & Dahm, 2015). Conversely, it may be that people higher in psychopathology, for example, depression, may be less able to be kind to themselves or be less able to access a balanced mind state or a sense of common humanity when they suffer. Consistent with this hypothesis, Trompetter et al. (2016) found people higher in depressive symptoms have an impaired ability to treat themselves with kindness when they suffer, or in other words, to be self-compassionate.

Secondly, self-compassion may have positive effects on physical health through both direct (physiological) (Gilbert, et al., 2009; Rockliff, Karl, McEwan, Gilbert, & Matos, 2011; Breines & Chen, 2013) and indirect (behavioural) processes (Terry & Leary, 2011; Sirois, et al., 2015). Suggestions that self-compassion might protect against the physiological effects of stress are consistent with results of a brief compassion-focused intervention during which participants were instructed to imagine compassion for themselves being directed towards them from an external compassionate figure. Results showed reductions in cortisol levels in the compassion group, compared to persons randomized to a relaxation condition or to complete a control task (Rockcliff, Gilbert, McEwan, Lightman, & Glover, 2008). The same exercise also increased heart-rate variability, associated with a greater self-regulatory ability (Porges, 2007). While preliminary, the suggestion that self-compassion may have direct physiological effects linked to a greater capacity to self-soothe has important
implications for physical health in general, and in particular for patient populations such as those living with diabetes, in which stress and distress are not only common, but predictive of worse health outcomes.

One explanation for these apparent calming effects is found in an evolution-based model regarding the protective capability of self-compassion. This approach proposes that the brain-body processes stimulated by the compassion system may directly counter the effects of stress (Gilbert, 2009). So, for example, when the ‘self’ is attacked through self-criticism or negative self-evaluation, the same physiological responses are activated as would be in response to a threat or attack from an external source, with the associated release of cortisol and adrenalin required for fight or flight (Cosley, McCoy, Saslow, & Epel, 2010; Rockcliff, Gilbert, & McEwan, 2008; Arch, Brown, Dean, & Lanady, 2014; Rockcliff, et al., 2011). In theory, self-soothing processes associated with evolved attachment systems, studies have found increased oxytocin and opiates are released by gestures of self-compassion, a process that is thought to create a sense of safety and calm, with flow on neuro-biological effects (Gilbert, 2009; Rockcliff, et al.).

In parallel to physiological processes, self-compassion may promote better physical health through behaviours aligned to greater care of the physical self. Both theory and data suggest self-compassion may act as an emotion regulatory strategy linked to more adaptive reactions to disease and illness, as well as greater motivation to act in ways consistent with better health outcomes. For example, the trait self-compassion has been linked to behaviours such as attending to physical symptoms more quickly (Terry & Leary, 2011). More broadly, evidence from a recent meta-analysis of 15 studies ($n = 253$) showed that self-compassion was consistently associated with greater practice of a range of positive health behaviours including
healthy eating, regular physical activity, stress management and positive sleep habits (Sirois, et al., 2014).

In the context of a chronic disease then, being self-compassionate may entail caring and comforting the self and facilitate the adoption of health behaviours aligned with greater well-being (e.g., seeking and/or adhering to medical treatments and regulating negative affect) (Scheier & Carver, 2003; Terry & Leary, 2011). Furthermore, because failure to meet personal health goals often triggers feelings of shame and guilt and is linked to goal disengagement rather than persistence (Sirois & Giguère, 2013), responding to failure with self-compassion may facilitate behaviours consistent with desirable health outcomes. For example, understanding failure is part of the human condition, and responding with self-kindness and a sense of equilibrium instead of being caught up in negative self-evaluation and rumination, may free up self-regulatory resources that can be applied to the enactment of positive health behaviour (Sirois, et al., 2014; Terry & Leary, 2011). As such, self-compassion may be a desirable resource, predictive of better overall health outcomes for both healthy and medically unwell populations.

3.4 Self-compassion among patient groups

While the vast majority of studies so far have taken place among medically healthy participants, there are a small handful of studies in patient populations. In general, such studies have demonstrated a similar pattern of effect on indices of negative and positive emotionality, as well as predicting better outcomes on condition-specific metrics (Pinto-Gouveia, Duarte, Matos, & Fraguas, 2014; Wren et al., 2012; Brion, Leary, & Drabkin, 2014). For example, one study of self-compassion among cancer patients found lower self-compassion predicted greater depressive and stress symptoms, and lower scores on quality of life dimensions (Pinto-Gouveia, 2013).
Another study among obese patients with chronic musculoskeletal pain showed self-compassion predicted less negative affect, greater positive affect, and less pain catastrophizing and pain disability (Wren, et al., 2012). Finally, a study among patients with HIV/AIDS showed trait self-compassion was associated with more adaptive reactions to having the condition, including less negative emotion, better psychological adjustment overall, and evidence of coping more successfully with their illness (Brion, Leary, & Drabkin, 2014).

Although, there had been no studies investigating self-compassion among diabetes patients prior to the publication of evidence reported in this thesis, the suggestion that self-compassion predicts better health outcomes in both healthy and patient populations has important implications for patients living with diabetes. As was outlined in Chapter 2, self-criticism and rumination (implying an absence of self-compassion) are both common among diabetes patients given the demands of coping with the disease as well as being strong predictors of depression (Joeng & Turner, 2015; Pinto-Gouveia, Castilho, Matos, & Xavier, 2013). Increasing the capacity to self-soothe by responding to one’s suffering with kindness and understanding may therefore offer some form of protection against the often devastating consequences of negative mood states. Furthermore, the increased capacity to self-regulate may be important in terms of the links between negative mood and metabolic outcomes. Self-compassion may therefore be a crucial missing element in current diabetes treatment paradigms, providing an overall supportive context in which suffering can be met with constant kindness, with beneficial flow-on effects on both psychological and physical health.

Drawing from existing empirical studies in healthy and patient populations, the following chapter presents a review of the available evidence for the utility of self-
compassion in this patient group, together with a theoretical rationale for its likely benefits. Potential cognitive, behavioural and biological processes for the beneficial effects of self-compassion on mood and metabolic outcomes are described and it is suggested that greater self-compassion may be associated with lesser negative emotionality and stress reactivity. It is further suggested that patients higher in self-compassion may be better able to self-regulate health behaviours and maintain essential medical regimes, resulting in better glycaemic control and better overall physical and mental health outcomes.

4.1 Preface

As detailed in the preceding introductory chapters, living with diabetes can be hard. Frequent opportunities for self-criticism are not hard to find; for example, one might consider self-care or diet to be inadequate or be disappointed with the results of blood glucose testing. Within the context of this thesis, how one tolerates the distress evoked by self-management failures is seen as likely to be crucial in determining subsequent mood, behavioural, and metabolic outcomes for diabetes patients.

Conversely, a central tenant of this thesis is that the development of self-compassion skills might help diabetes patients adapt to difficult circumstances in several ways. Firstly, self-compassion may assist by increasing positive mood states and ameliorating negative mood states (MacBeth & Gumley, 2012). Secondly, it may enable one to confront the realities of one’s physical and medical condition without the added stressors of self-judgment, isolation, and over-identifying with either the condition or with suffering itself, thus enabling action-taking consistent with effective self-care (Terry & Leary, 2011; Sirois, Kitner, & Hirsch, 2015). Thirdly, self-compassion might be related to biological markers associated with diabetes via self-compassion’s association with positive mental states, which are themselves linked to physical health (Boehm, Vie, & Kubzansky, 2012).

At the time the following published article was conceived, evidence for self-compassion was, in general, relatively scattered, particularly with regard to associations between self-compassion and physical health. Furthermore, most evidence was derived from studies conducted among medically well populations, with only a very small handful of preliminary studies investigating its application to medically unwell populations (for example, Pinto-Gouveia, Duaret, Matos, & Fraguas,
More importantly, there had been no prior studies of self-compassion among diabetes patients, a population in which psychological suffering is considerable, and for whom there is a commensurate need for effective intervention. Therefore, constructing a preliminary rationale and theoretical model by which self-compassion might be beneficial to patients living with diabetes, and delivering that to practitioners and researchers, was a necessary first step in the thesis process.

As such, the following chapter presents a preliminary review and research agenda for subsequent investigations of the utility of self-compassion among diabetes patients. Previously published in Diabetes Spectrum, this is a novel contribution to the field and posits that self-compassion may be a crucial missing link in current literature, providing an overall supportive context in which suffering can be met with constant kindness.

Citation

4.2 Abstract

Depression and severe psychological distress are frequently co-morbid with diabetes, and are associated with reduced adherence to medication and lifestyle regimes, poorer glycemic control, and increased complications. The mixed success of existing treatments for depression in diabetes patients suggests a need for supplementary approaches to this common problem. This paper reviews recent evidence for the benefits of self-compassion in chronically ill patients, suggesting its utility as a clinical tool for improving self-care, depression, and glycemic control in diabetes. Possible physical and psychological pathways by which self-compassion may promote better outcomes in diabetes patients are considered, with particular attention given to reductions in negative self-judgment and improved motivation to undertake self-care.

4.3 Introduction

Diabetes can be described as a tidal wave about to crash on the shores of health systems around the world, with an estimated 347 million sufferers worldwide (WHO Diabetes, 2011) Living with diabetes is challenging, demanding a relentless effort to achieve healthy glycemic control through strict behavioral self-regulation and adherence to medical regimens. Making self-management more complex, serious psychological difficulties are frequently present among diabetes patients, accompanied by increased suffering and compromised quality of life (Snoek & Skinner, 2002). Building on evidence linking positive aspects of psychological adjustment to improved coping in physically ill populations, this article describes how research into self-compassion may offer a supplementary framework for the improved management of diabetes, providing some protection against depression and its down-stream effects.
4.4 Depression in diabetes: The status quo

The prevalence of depression in diabetes is well documented, with a raft of research over the last two decades focusing on links between the two conditions. People with diabetes are between 1.4 – 3 times more likely to develop depression compared to the general population (Andreoulakis, Hyphantism, Kndylis, & Iacovides, 2012), with depression affecting around 15 – 20% of diabetes patients overall (Ali, Stone, Peters, Davies, & Khunti, 2006). When subclinical depression is included, prevalence estimates are greater, with at least two-thirds of a large sample of Type 2 patients experiencing depressive symptoms (Gonzalez, Safren, Gagliero, et al., 2007).

Co-morbid depression in diabetes patients is associated with poorer metabolic control, an outcome that predicts hyperglycemia and an increased risk of diabetes-related complications and mortality (Pouwer, Nefs, & Nouwen, 2013). These complications are, in turn, thought to be least partly mediated by depression’s association with poor adherence to medication and lifestyle recommendations, both of which predict reduced quality of life and increased health care costs (Lustman & Clouse, 2005).

If anything, these figures likely underestimate both the prevalence of affective disturbances in diabetes as well as the associated costs of disease management, suggesting the problem of depression may be far larger than is currently accepted. Commensurately, the negative effects of these conditions on critical self-care regimens - and the resulting consequences in terms of increased disability, healthcare utilization and mortality - may also be far more widespread.

4.5 Current treatment approaches

Given the scale of the problem of depression in diabetes, evidence to support the effectiveness of current anti-depressant therapies is surprisingly sparse, and overall
outcomes still unclear. A recent systematic review and meta-analysis (Van der Felt-Cornelis, Nuyen, Stoop, et al., 2010), including 14 RCTs evaluating psychotherapy, pharmacotherapy and collaborative care in 1724 diabetes patients with co-morbid depression, showed moderate effects for treatment overall. It should be noted, however, that four out of the five RCTs ($n = 310$) involving a psychotherapeutic intervention, such as cognitive behavioral therapy (CBT), also included other supportive treatment, such as diabetes education, alongside the psychotherapy, making it difficult to assess the merits of the psychological intervention in isolation. Additionally, most studies were small (10 studies investigated samples ranging from 13 and 60 participants), and mainly involved Type 2 patients, meaning results may not be generalizable to insulin-dependent Type 1 patients.

Furthermore, while depression in diabetes patients is linked to glycemic indices, it is not yet clear if successfully treating low mood is associated with improved metabolic control. One review, (Lustman & Clouse, 2005) found that improvements in depression were linked to improvements in glycemic control and overall perceptions of well-being. Contradicting these findings, however, are results of a meta-analysis (11 studies in adults and 10 studies in children and adolescents) which showed that while both CBT and antidepressant medications were associated with an improvement in blood glucose readings in some studies, overall, there was no significant effect of either of these treatments on glycemic control in adults, and only weak evidence in children and adolescents (Winkley, Landau, Eisler, & Ismail, 2006).

Successfully treating depression in diabetes is further complicated by the difficulty detecting the presence of low mood, with evidence that only a small fraction of depressed patients receive any form of treatment, likely due to an overlap between symptoms of both conditions, such as pain and fatigue. (Lustman & Clouse;
Hawmandeh, Almakhzoomy, & Hayajneh, 2013; Katon, 2011). Furthermore, patients with diabetes may find depression difficult to acknowledge as it represents another area for them to be dissatisfied with themselves, perhaps further evidence of personal failure beyond their daily struggle with self-management targets (Egede & Osborn, 2010) and a focus, therefore, for continued negative self-judgment.

In summary, evidence for the treatment of depression in diabetes patients is limited, with existing studies suggesting modest effects in some groups, at best. Further investigation is essential in light of the devastating downstream effects of depression on glycemic control and overall quality of life. Emerging research into the construct of self-compassion, with its specific focus on reducing self-criticism and treating oneself kindly, suggests its potential utility for this population.

4.6 Self-compassion: Does kindness matter?

Self-compassion is defined as the practice of treating oneself with kindness, care and concern in the face of negative events (Neff, 2003a; Gilbert, 2009). For diabetes patients ‘negative events’ may include receiving less-than optimal blood glucose readings together with other self-management failures involving non-adherence to medication, diet and exercise prescriptions (Barnard & Lloyd, 2012). In this context, self-criticism, a common consequence of self-care failure among diabetes patients, can be seen as the opposite of self-compassion (Neff, 2011).

Neff (2003a) conceptualizes self-compassion as composed of three components - all of which may be relevant to the experience of living with diabetes and managing its daily demands. Firstly, self-kindness refers to the tendency to be caring and understanding of oneself rather than being harshly critical or judgmental. Secondly, common humanity recognizes that all humans are imperfect, fail and make mistakes, framing difficulties and painful experiences in light of the shared human experience.
Finally, *mindfulness*, the third component of self-compassion, involves being aware of the present moment experience so that one neither ignores, nor ruminates, on disliked aspects of oneself or behavior. (Neff & Dahm, 2015).

Taken together, developing these capacities may not only enable the individual to reflect concern and compassion towards others, but may also improve the capacity to direct this same concern and compassion towards oneself (Neff, 2003a). In doing so, self-compassion may offer not only a gentler way of self-relating, but one that may have the potential to reduce the depression and psychological suffering often associated with diabetes and its management. In the following section, the direct and indirect pathways by which both self-compassion and depression may relate to diabetes self-management are briefly reviewed, suggesting the utility of self-compassion for improving both mood and overall diabetes outcomes (see Figure 4.1 below).
Figure 4.1. Interlocking cogs illustrating hypothesized processes linking self-compassion to improved outcomes in diabetes patients. Increasing self-compassion may reduce depression, leading to improved outcomes via mechanisms including increased motivation and reduced self-criticism.

4.7 Depression and self-compassion: Common pathways?

Although the exact mechanisms by which depression is associated with markers of diabetes remain uncertain, there is evidence to suggest both direct (physiological) and indirect (behavioral) pathways. Interestingly, in terms of the current discussion, emerging evidence suggests self-compassion may operate through similar processes.
4.7.1 Direct pathways

Early studies indicate depression may complicate, or possibly contribute to the cause of diabetes due to direct, reciprocal effects on endocrine and other physiological processes. These effects include abnormalities of the hypothalamic-pituitary-adrenal axis, changes in sympathetic nervous system functioning as measured by decreased heart rate variability (HRV), and increased release of inflammatory cytokines (Katon, 2011; Golden, 2007; Donath & Shoelson, 2011). Support for a possible biological link between depression and diabetes is demonstrated in a recent meta-analysis involving 24 studies which found patients with depression had significantly higher concentrations of TNF-alpha and interleukin-6 (IL-6) levels compared with non-depressed subjects (Pizzi, Manzoli, Mancini, et al., 2010). In turn, markers of inflammation, such as IL-6, have been proposed to be involved in diabetes disease onset (Kristiansen & Mandrup-Pousen, 2005).

Interestingly, emerging evidence suggests self-compassion might be linked to improved mood through similar, or related, metabolic and autonomic processes, including inflammatory and sympathetic nervous system responses to stress. Cross-sectional reports show self-compassion is associated with lower blood plasma levels of IL-6 (Breines, Thoma, Gianferante, Hanlin, Chen, & Rohleder, 2014) as well as improved autonomic nervous system responding to stress, (Rockliff, Gilbert, McEwan, Lightman, & Glover, 2008) as measured by increased HRV (Thayer, Hansen, Saus-Rose, & Johnson, 2009) Such data are consistent with the theoretical proposition that self-compassion may calm the threat system (which is associated with defensiveness and autonomic arousal), and activate the self-soothing system (Gilbert, 2009).

A series of experimental studies suggests quantifiable physiological and neurological processes underlie the experience of self-compassion. Klimecki and colleagues (Klimecki, Leiberg, Lamm, & Singer, 2013) used fMRI to demonstrate that
the specific neuronal networks associated with love and affiliation were activated following the experimental stimulation of compassion. Participants also demonstrated an increase in positive affect; compared with a memory control, participants who reacted with negative affect when witnessing others in distress before compassion training, subsequently showed increased positive affective experiences after training. Weng et al (Weng, Fox, Shackman, et al., 2013) also found that compassion training both increased altruistic behavior as well as neural responses to suffering, including activation of the inferior parietal cortex and dorsolateral prefrontal cortex.

Taken together, these early findings suggest activation of attachment and affiliation circuitry through self-compassion may be linked to particular direct processes involving autonomic and metabolic pathways that may be common to both depression and diabetes.

4.7.2 Indirect pathways

While depression and self-compassion may be associated with processes directly linked to physical health, a number of cross-sectional and experimental studies, in both patient and non-patient populations, suggest compassion may alter psychological and behavioural processes leading to reductions in depressed affect and better self-regulation.

Firstly, consistent evidence suggests self-compassion is related to physical and psychological health as a result of reduced negative affect (Neff & Dahm, 2015; Macbeth & Gumley, 2012; Neff & Germer, 2012; Neff, Kirkpatrick, & Rude, 2007). For example, in a study in patients with obesity and pain problems, (Wren, Somers, Wright, Goetz, Leary, & Fras, 2012) self-compassion predicted lower negative affect, higher positive affect, more adaptive pain coping, higher pain self-efficacy and lower pain catastrophizing. Self-compassion also predicted more adaptive reactions to having HIV,
including better adjustment, lower stress, anxiety and shame (Brion, Leary, & Drabkin, 2013). Such studies suggest more self-compassionate people may treat themselves more kindly, to recognize that their problems are common aspects of human experience and, as a consequence, be less ruminative and self-judgmental when confronting negative or difficult feelings (Neff, Rude, & Kirkpatrick, 2006).

On the other hand, the opposites of self-compassion such as self-criticism, self-hate, self-judgment and negative perfectionism have been linked to greater psychological distress, including depression (Neff, 2011). One recent study in chronically ill patients found that self-criticism predicted depression, illness-related stress and quality of life (Pinto-Gouveia, Duarte, Matos, & Fráguas, 2013). Other non-patient (college student) data likewise suggest a key role for self-criticism; self-reported physical symptoms increased as self-judgment increased and self-kindness decreased (Hall, Row, Wuensch, & Godley, 2013). Self-judgment may be particularly important to investigate in relation to diabetes patients given the daily demands of managing the illness and the difficulty in achieving “ideal” metabolic control, which seems a likely trigger for self-criticism (Barnard & Lloyd, 2012).

A second indirect pathway by which self-compassion may improve physical health among diabetes patients is as a consequence of greater self-care (Penninx, Guralnik, Ferrucci, Simonsick, Deeg, & Wallace, 1988). Evidence for this possibility can be seen in research indicating that people reporting greater self-compassion may take greater responsibility for their problems and be less overwhelmed by difficulties, suggesting they are more likely to take care of themselves when ill or injured (Terry, Leary, Mehta, & Henderson, 2013). For diabetes patients, it may be that “taking care” of the self includes the seeking of medical treatment, maintaining regular physical activity, appropriate dietary behavior, regular foot checks and self-monitoring of blood
glucose. This suggestion is consistent with data from a study with Type 2 patients, which showed depression predicted a decline in the self-care routines that protect against poor glucose control and the development of complications (Egede & Osborn, 2010).

Provocatively, Egede and Osborn (2010) suggest that the link between depression and poor self-care is mediated by a decline in the *motivation* to maintain self-care. A series of experimental studies in non-patient groups (Breines & Chen, 2012) adds weight to this suggestion, showing self-compassion leads to increased self-improvement motivations, possibly because it provides a nonjudgmental context in which to appraise one’s strengths and weaknesses and to strive to improve without the threat of unhelpful self-criticism. In the context of diabetes, enhancing self-compassion may thus enable patients to address evidence of less-than-ideal control without paralyzing self-criticism, reappraising and adjusting goals in support of good control.

The idea that self-compassionate individuals may be more motivated to take care of their health out of a desire to maximize well-being is also consistent with studies of several health behaviours that are directly related to outcomes among patients with diabetes. For example, interventions to maintain diets (Adams & Leary, 2007), and exercise (Magnus, Kowalski, & McHugh, 2010), and to quit smoking (Kelly, Zuroff, Foa & Gilbert, 2010), have demonstrated the positive influence of self-compassion on affect and behavior. Kelly et al, (2010) found smokers who were high in self-criticism were helped to achieve their goals with an intervention that stimulated warmth and understanding while they attempted to quit. These authors suggest that for high self-critics in particular, self-compassion might inhibit a reflex towards rumination and self-judgment when faced with setbacks, helping them tolerate the distress they experience while trying to quit, and enabling self-regulation via the
soothing system rather than the threat system (Gilbert, 2009). A further intervention study found that a self-compassion induction helped reduce negative self-evaluation, distress, and subsequent food consumption among highly restrictive eaters compared to dieters in a control condition (Adams & Leary, 2007). Participants in the self-compassion condition were able to hold eating goals in mind, without ruminating or allowing negative evaluation to interfere with their eating goals. Alterations in self-management when confronting failures may be highly relevant to diabetes patients who are generally required to monitor food intake as part of controlling blood glucose and can be assumed to experience set backs as part of daily life. Finally, another study (Magnus, Kowalski, & McHugh, 2010) found self-compassion predicted superior exercise-related outcomes among women. Specifically, self-compassion was related to greater *intrinsic* motivation (behaviors initiated and regulated through choice as an expression of oneself) and lower *external* motivation (behaviors pressured by environmental forces) (Ryan & Deci, 2000). In sum, these initial studies are encouraging in that they illuminate the potential utility of self-compassion based interventions in improving some of the health behaviors that routinely challenge diabetes patients.

Finally, a theoretical model (Terry & Leary, 2011) suggests a third indirect pathway by which self-compassion may be linked to improved health as a consequence of broad improvements in motivational management and self-regulation (Baumeister & Heatherton, 1996). Successful self-regulation involves goal selection, engaging in behaviors that support achievement of those goals, monitoring goal progress, and adjusting those goals when sufficient progress is not being made, all highly relevant to diabetes health. It seems likely that more self-compassionate people may therefore attend to their own self-care out of a desire to treat themselves kindly and well by
engaging in behaviors that support their ultimate good. They may, for example, set
more specific, achievable and appropriate goals around diet, exercise and blood glucose
targets, might prioritize attendance to these goals perhaps through regular medical
appointments, might adhere to regular medication and testing regimes and disengage
from diet and exercise goals that are not working, and establish new behavioral targets
associated with better control. Evidence of this can be seen in a study with a large
sample of participants (n = 241) with a range of serious medical conditions which found
that self-compassionate people were more likely to take action with regard to their
medical problems, including promptly visiting health care professionals when needed
(Terry, Leary, Mehta, & Henderson, 2013). Further analyses suggest the benefits of self-
compassion on outcomes resulted from the combined influence of benevolent self talk,
a motivation to treat oneself kindly, and a tendency to be proactive with regards to
one’s health.

4.8 Self-compassion and hypothesized effects in diabetes self-management

Although self-compassion research to date has not specifically examined its possible
utility in diabetes patients, several considerations suggest that findings linking self-
compassion with improved psychological and physical health, through both direct and
indirect processes, could be of particular relevance to this group. First, the daily
struggle of a diabetes patient to maintain adequate control is frequently characterized
by negative feelings of stress, anxiety, guilt and shame (Barnard & Lloyd, 2012).
particularly when patients are continually reminded that their long-term health is
dependent on their ability to self-manage. Second, maintaining good control involves
ongoing adherence to a relentless daily self-management regimen in order to maintain
optimal health and reduce the risk of long-term complications. Self-compassion may
support adherence by reducing distressing and demotivating cognitive and emotional
responses to medical problems, such as self-blame, non-acceptance and anger (Terry & Leary, 2011; Terry, Leary, & Mehta, 2013). Negative emotions often accompany a diagnosis of a chronic, incurable illness such as diabetes (Barnard & Lloyd, 2012). And these emotions may be in themselves linked to self-regulatory failure (Brion, Leary, & Drabkin, 2013). Third, self-compassion may be linked to improved adherence through increased conscientiousness (Neff, Rude, & Kirkpatrick, 2006). It may be that the emotional stability provided by self-compassion helps engender more responsible behavior, even though taking care of one’s health by maintaining a good diet and exercising frequently might initially involve a certain amount of displeasure.

Overall, the relationships between diabetes, psychological distress, depression and self-care are complex and the pathways by which they are related are not yet fully understood. What is clear, however, is that depression and distress play an important role in increasing the suffering and complications associated with managing this chronic condition (Hawamdeh, Almakhzoomy, & Hayajneh, 2013; Golden, 2007) and that current approaches are having mixed success. Given its links with improved psychological and physical health, self-compassion based interventions may be a supplementary approach with the potential to reduce this suffering and its effect on physical health outcomes among diabetes patients.

4.9 Summary
As discussed, depression often complicates the original diagnosis of diabetes, leading to worse outcomes. Nascent research suggests that intervening to increase self-compassion, a construct that appears to tap into brain structures adapted for self-soothing and calming, may have quantifiable physiological, psychological and behavioral effects that may help diabetes patients cope better with their condition and enjoy an improved quality of life. In particular, the bulk of research to date suggests
processes involving a reduction in negative self-evaluation and improved motivations for self-care may underpin self-compassion’s beneficial effects on physical and psychological health. As such, the utility of self-compassion as an intervention to reduce self-criticism, improve mood, and increase motivation to maintain self-care among diabetes patients may be worthy of substantial further investigation.
Chapter 5. Self-Compassion Buffers the Negative Impact of Distress on HbA$_{1c}$

5.1 Preface

In the preceding chapter, a theoretical framework for the hypothesized effects of self-compassion for improving mental and physical health outcome for diabetes patients was presented. A core assumption of the approach being developed here is that by reducing the tendency to criticise the self, increased self-compassion would predict lower depression and fewer mood problems. It should thus provide a buffer against the negative flow-on effects of low mood on metabolic outcomes through both direct and indirect processes. However, until the publication of the paper “Does Kindness Matter? Self-compassion buffers the negative impact of distress on HbA$_{1c}$” in *Diabetic Medicine*, there had been no empirical investigations of self-compassion among diabetes patients. Thus, the first contribution of the following chapter is to present the results of a preliminary, cross-sectional investigation of the links between self-compassion and psychological and metabolic markers of health among diabetes patients. This study is, therefore, an important first step in establishing an evidence base for these hypothesized relationships.

Secondly, the study also addresses the question as to whether depression or diabetes distress are better predictors of negative emotionality might be the better predictor of HbA$_{1c}$ in this sample, building on early investigations suggesting that different types of mood difficulty may be differentially relevant to metabolic outcomes among diabetes patients (Fisher, Mullan, Arean, Glasgow, Hessler, & Masharani, 2010). Not only does this add valuable data to an evidence base that increasingly suggests depression and diabetes distress are qualitatively and quantitatively different but it also provides evidence of the relationship of self-compassion to each of these two constructs, an important foundation for subsequent investigations (Fisher et al.).
Citation

5.2 Abstract

Introduction: Higher self-compassion is associated with mental and physical health benefits in both healthy and chronically-ill populations. The current study investigated the role of self-compassion in predicting depression, diabetes-specific distress, and HbA1c in diabetes patients.

Aims: To assess the specific operationalization of negative emotionality that best predicted HbA1c and to test whether self-compassion would buffer diabetes patients’ HbA1c against the negative effects of distress.

Methods: Diabetes patients (n = 110) completed measures assessing trait self-compassion, depression and diabetes-distress. HbA1c results were obtained through medical records.

Results: As expected, diabetes-specific distress was a better predictor of HbA1c than depression; self-compassion moderated the relationship between distress and HbA1c such that higher distress predicted higher HbA1c at lower levels of self-compassion, but not at higher levels of self-compassion.

Conclusions: In addition to further demonstrating the link between distress and metabolic outcomes, these findings suggest self-compassion might buffer patients from the negative metabolic consequences of diabetes distress.
5.3 Introduction

The link between diabetes and depression is well established, with diabetes thought to at least double the likelihood of a co-morbid, uni-polar depressive disorder (Snoek & Skinner, 2002). Not only does depression make living with diabetes more difficult, it also predicts increased micro-vascular complications and heart disease (Pouwer, Nefs, & Nouwen, 2013), possibly as a consequence of poorer glycemic control (Fisher, Mullan, Arean, Glasgow, Hessler, & Masharani, 2010). Research into the treatment of depression in diabetes patients suggests mixed outcomes, with moderate effects for treatment overall (Van der Felt-Cornelis, et al., 2010), but no consistent flow-on effect in terms of improved HbA1c (Lustman & Clouse, 2005). A meta-analysis showed no overall effect of treatment with either cognitive behavioral therapy or antidepressant medications on metabolic management among adults (Winkley, Landau, Eisler, & Ismail, 2006), but a more recent study (Carper, Traeger, Gonzalez, Wexler, Psaros, & Safren, 2014) and review (Van der Felt-Cornelis et al., 2010), found improvements in depression were linked to improved glycemic control.

While research has focused on the relationship of depression to HbA1c, the effects of other, sub-clinical forms of emotional distress on diabetes outcomes are less well understood (Van der Felt-Cornelis et al., 2010; Rustad, Musselman, & Nemeroff, 2011; Katon, Simon, Russo, Von Korff, Lin, & Ludman, 2004). A few recent studies have suggested that it is the distress and negative mood resulting from the burden of managing one’s diabetes that is more strongly related to glycemic control rather than depression per se (Fisher, Glasgow, Mullan, Skaff, & Polonsky, 2008). Other work shows that diabetes-specific emotional distress mediates the association between depression and glycemic control (Van Bastelaar, et al., 2010), a finding again implying that condition-specific distress may be better than depression in terms of predicting metabolic management. These results suggest the possibility that the inconsistent
findings mentioned above may be attributable to variations in the way depression and distress have been operationalized. The current report, therefore, specifically contrasts the ability of diabetes-specific distress and depression to predict HbA1c.

More broadly, the mixed evidence for the success of existing treatments for depression among diabetes patients implies the need to consider alternate or supplementary approaches to the management of mood issues in this population. One area of emerging interest for treating emotional difficulties in both patient and non-patient populations is self-compassion. Defined as the practice of treating oneself with kindness in the face of negative events, self-compassion can be seen as an emotion regulation strategy by which painful feelings are not avoided, but are instead held with “mindfulness awareness, understanding and a sense of common humanity” (Neff, 2003a). Relating to oneself with compassion (rather than criticism or judgment) has been linked to a range of positive psychological and physical health outcomes, including decreased depression and improved coping in patients with chronic illness (Neff & Dahm, 2015) as well as enhanced self-care motivation (Terry & Leary, 2011) which may be central to sustaining the behaviors needed for optimum metabolic control. Finally, self-compassion may also have a role in improving physiological health processes of particular relevance to diabetes patients, including inflammatory and sympathetic nervous system responses to stress, with recent studies showing higher self-compassion is linked to lower blood plasma levels of IL-6 (Breines, Thoma, Gianferante, Hanlin, Chen, & Rohleder, 2014) and improved heart rate variability (Rockliff, Gilbert, McEwan, Lightman, & Glover, 2008).

In extending research in this area, this report draws on evidence linking effective self-regulation with improved health outcomes (Cameron & Leventhal, 2003). In addition to investigating the possibility that emotional distress specifically related to
self-management failures may better predict metabolic control than depression, we test the possibility that being dispositionally self-compassionate may buffer the deleterious impact of negative emotionality on glycemic indices. We evaluate whether self-compassion predicts improved metabolic control as measured by HbA1c as well as exploring the possibility that, rather than having a direct main effect on metabolic outcomes, self-compassion might moderate the effect of negative affectivity on HbA1c.

5.4 Procedure

The study took place between July and November 2013, among patients of the Waitemata District Health Board’s (WDHB) Diabetes Clinic, a multidisciplinary service with predominantly Type 1 patients and those with more complicated Type 2 diabetes. All patients arriving for normal clinic visits over the four-month recruiting period were invited to take part via a poster advertisement at the clinic reception. Inclusion criteria were a minimum age of 18 years and a maximum age of 70 years, a diagnosis of either Type 1 or Type 2 diabetes, and fluency in English. There were no exclusion criteria. Consenting participants received questionnaire packet measuring trait self-compassion as well as aspects of diabetes self-management previously linked to metabolic control; depression (Van Steenbergen-Weijenburg, et al., 2010), distress (Katon, 2011), age and gender (Deniz, Kesici, & Sümer, 2008). Ethnicity, diabetes diagnosis, and age at diagnosis were also recorded. With permission, participants’ most recent (within three months) HbA1c values were drawn from medical records.

5.5 Measures

The PHQ-9 (Breines & Chen, 2012) assesses the symptoms of Major Depressive Disorder (MDD). Referring to a two-week time window, responders can choose to answer ‘not at all’, ‘various days’, ‘more than half the days’ and ‘almost every day’, with points assigned to each category. A summed score of the nine questions is calculated.
The PHQ-9 is widely used, with excellent psychometric properties, and validated with diabetes patients in both primary and specialized outpatient clinics (Van Steenbergen-Weijenburg, et al., 2010). Because depression and diabetes have several somatic symptoms in common, a higher cut-off point is considered appropriate for indicating the likelihood of MDD in diabetes than would be used with a medically well sample (Van Steenbergen-Weijenburg, et al.). As such, a cut-off point of 12 or above was used in differentiating MDD from sub-clinical depression in this study, even though an effect of this increased cut-off may be reduced sensitivity and specificity. Alpha reliability for the current study = 0.88.

*Diabetes Distress Scale-2 (DDS-2)* (Fisher et al, 2010). Diabetes-specific distress is a common condition that often includes high levels of negative affect. It is linked to poor bio-behavioral disease management (Fisher et al.). The DDS-2 is a two-item measure, derived from the 17-item Diabetes Distress Scale (DDS-17) asking respondents to rate on a 6-point scale the degree to which the following items caused distress, (1) *feeling overwhelmed by the demands of living with diabetes*, and (2) *feeling that I am often failing with my diabetes regimen*. Psychometric properties for the DDS-2 have been shown to approximate those for the longer DDS-17 (Fisher et al.). Summed scores greater or equal to 6 on the DDS-2 indicate the presence of clinically relevant distress likely to be affecting diabetes management. Alpha reliability for the current study = 0.84.

The *Self-Compassion Scale* (SCS) (Neff, 2003) is a 26-item questionnaire measured using a 5-point likert scale (*Almost never* = 1 to *Almost always* = 5), comprising positive subscales of self-kindness, common humanity and mindfulness, and negative subscales of self-judgment, isolation and over-identification. For example, the item “*when times are really difficult, I tend to be tough on myself*”, tests the capacity
for self-kindness versus self-criticism. “I try to see my failings as part of the human condition”, tests the capacity to understand life’s difficulties as part of being human, versus the tendency to isolate” (reverse scored). “When something upsets me, I try to keep my emotions in balance” tests the capacity for mindfulness versus over-identification with negative feelings (reverse scored). Studies (Neff, 2003; Deniz, Kesici, & Sümer, 2008) have demonstrated satisfactory psychometric properties and good test-retest reliability. The SCS has good discriminant validity, including being distinguishable from self-esteem (Neff, 2003). Factor analysis has confirmed the six-factor structure of the scale and the single higher-order component of self-compassion. The aggregate score in this study was acceptable, alpha = 0.77.

5.6 Participants

Of the 110 participants who completed the study, 67 were Type 1 patients, 20 were Type 2 patients, and 23 were Type 2 patients on insulin regimes. There were 38 males and 72 females in the sample and a mean age 47.64 years ($SD = 15.2$). Ethnicity was predominantly New Zealand/European (73.6%), with Maori (7.3%), Asian (5.5%), Other Pacific (0.9%), Other European (10.9%) and Other (1.8 %), approximating the ethnic make-up of the population served by the WDHB (see Table 5.1).
Table 5.1
Demographic and clinical characteristics of the sample

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Total (n = 110)</th>
<th>Type 1 (n = 67)</th>
<th>Type 2 (n = 20)</th>
<th>Type 2 (insulin) (n = 23)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>72</td>
<td>41</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Male</td>
<td>38</td>
<td>26</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Age in years</td>
<td>47.6 (15.2)</td>
<td>41.7 (13.8)*</td>
<td>58.7 (12.9)*</td>
<td>55.4 (12.5)*</td>
</tr>
<tr>
<td>Ethnicity – NZ European (% of total)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maori</td>
<td>8 (7.3%)</td>
<td>2 (3.0%)</td>
<td>1 (5.0%)</td>
<td>5 (21.7%)</td>
</tr>
<tr>
<td>Asian</td>
<td>6 (5.5%)</td>
<td>3 (4.5%)</td>
<td>1 (5.0%)</td>
<td>2 (8.7%)</td>
</tr>
<tr>
<td>Other Pacific</td>
<td>1 (0.9%)</td>
<td>1 (1.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other European</td>
<td>12 (10.9%)</td>
<td>8 (11.9%)</td>
<td>3 (15.0%)</td>
<td>1 (4.3%)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (1.8%)</td>
<td>2 (3.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years diabetic</td>
<td>16.7 (12.3)</td>
<td>18.9 (12.8)</td>
<td>8.0 (6.0)</td>
<td>17.2 (11.6)</td>
</tr>
<tr>
<td>HbA1c mmol/mol</td>
<td>69 (20.6)</td>
<td>70 (18.2)</td>
<td>62 (25.9)</td>
<td>73 (22.6)</td>
</tr>
<tr>
<td>HbA1c %</td>
<td>8.5 (1.9)</td>
<td>8.5 (1.7)</td>
<td>7.8 (2.4)</td>
<td>8.9 (2.1)</td>
</tr>
<tr>
<td>Depressed (PHQ-9 ≥12) (% of total)</td>
<td>21 (19.1%)</td>
<td>11 (16.4%)</td>
<td>3 (15.0%)</td>
<td>7 (30.4%)</td>
</tr>
<tr>
<td>Distressed (DDS-2 ≥6) (% of total)</td>
<td>62 (56.5%)</td>
<td>34 (50.7%)</td>
<td>12 (60.0%)</td>
<td>16 (69.6%)</td>
</tr>
<tr>
<td>Psychosocial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>6.8 (5.6)</td>
<td>6.1 (5.6)</td>
<td>6.8 (4.5)</td>
<td>8.7 (6.3)</td>
</tr>
<tr>
<td>Diabetes-distress</td>
<td>6.3 (2.7)</td>
<td>6.2 (2.6)</td>
<td>6.1 (2.8)</td>
<td>6.9 (3.0)</td>
</tr>
<tr>
<td>Self-compassion</td>
<td>80.0 (16.8)</td>
<td>79.4 (16.5)</td>
<td>84.7 (15.7)</td>
<td>78.1 (18.6)</td>
</tr>
</tbody>
</table>

Data shown as mean, with standard deviations (SD) in parentheses.

*Significant difference in age between Type 1, and both Type 2 diabetes patients, \(F(2,107) = 17.3, p < .001.\)
5.7 Analytic strategy

All data were screened for statistical assumptions. Missing HbA\textsubscript{1c} data ($n = 11$) was imputed by calculating the mean HbA\textsubscript{1c} scores for the sample. Covariates (gender and age) were identified using preliminary Pearson correlations (with Spearman Rank used for the analysis of gender). While there were no overall differences between Type 1, Type 2, and Type 2 Insulin patients among the predictor variables of interest (distress, depression, self-compassion, and HbA\textsubscript{1c}), dummy codes representing diabetes subtypes were used as control variables within each model, with the statistically most common Type 1 patients defined as the referent group.

Commensurate with our research focus, the two key predictions were then tested using multiple regressions in which the effects of age, gender and subtype were controlled at Step 1. In the first model (see Table 5.3), the ability of depression versus diabetes-specific distress to predict HbA\textsubscript{1c} above confounds was tested using forward entry at Step 2 (an analytic approach that permits the algorithm to select the variable that best improves model fit, thus addressing the question of which of depression or distress is the better predictor). A second model then force-entered self-compassion and the interaction between self-compassion and distress in the second step. This approach permits an examination of whether self-compassion itself predicts HbA\textsubscript{1c} as well as whether it moderates the negative effect of distress on HbA\textsubscript{1c}.

5.8 Results

Preliminary correlational analysis (see Table 5.2) showed age and gender were associated with the outcomes of interest (self-compassion, HbA\textsubscript{1c}, depression and diabetes-distress) and were therefore retained as controls. Because results indicated lower age was related to higher HbA\textsubscript{1c} ($r = -.27$), we conducted additional analysis in which this relationship was stratified by diabetes subtype. Results showed a significant
negative relationship between age and HbA\textsubscript{1c} in Type 1 patients ($r = -.34$, $p < .01$), but no relationship between Type 2 ($r = -.17$, $p = .48$) and Type 2 Insulin ($r = -.16$, $p = .48$).

Correlations were found among the main predictor variables of interest; self-compassion, depression (PHQ-9) and diabetes-distress (DDS-2), ($p < .001$). As self-compassion increased, depression and diabetes-distress scores decreased (see Table 5.2 below).
Table 5.2
Correlations between self-compassion (SCS), depression (PHQ-9), HbA₁c, diabetes-distress (DDS-2), age and gender

<table>
<thead>
<tr>
<th>Scale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Self-compassion</td>
<td></td>
<td>-.57**</td>
<td>-.58**</td>
<td>-.17</td>
<td>.29**</td>
<td>-.13</td>
</tr>
<tr>
<td>2. Depression (PHQ-9)</td>
<td></td>
<td></td>
<td>.63**</td>
<td>.22*</td>
<td>-.06</td>
<td>.13</td>
</tr>
<tr>
<td>3. Diabetes distress (DDS-2)</td>
<td></td>
<td></td>
<td></td>
<td>.33**</td>
<td>-.15</td>
<td>.24*</td>
</tr>
<tr>
<td>4. HbA₁c</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.27**</td>
<td>.06</td>
</tr>
<tr>
<td>5. Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.08</td>
</tr>
<tr>
<td>6. Gender a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* *p<.05 (2-tailed), **p<.001 (two-tailed), a Spearman’s rank correlation
5.8.1 Diabetes specific distress versus depression as a predictor of HbA1c

To assess the ability of distress versus depression to better predict metabolic control, control variables (age, gender, and diabetes subtype dummy codes) were entered at Step 1, explaining 9.3% of the variance in HbA1c. Forward entry at Step 2 selected distress (rather than depression) into the model, which now explained 15.8% of the variance in HbA1c, $F(5, 104) = 3.92$, an increase of nearly 7%, $R^2 \Delta = .07$, $F\Delta (1, 104) = 8.11$, $p < .05$. As expected, HbA1c increased as distress increased (see Table 5.3). In light of the fact that distress was selected rather than depression, subsequent analyses used diabetes-distress as the operationalization of negative affect that best predicted HbA1c.

Table 5.3
Statistics for multiple regression analysis with forward entry of diabetes-distress and depression at Step 2 for operationalization of ‘negative affect’ in predicting HbA1c

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>$p R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>1.17</td>
<td>3.88</td>
<td>.03</td>
<td>.00</td>
</tr>
<tr>
<td>Age</td>
<td>-.38</td>
<td>.14</td>
<td>-.29*</td>
<td>.06</td>
</tr>
<tr>
<td>Type1 (Ref)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Type 2</td>
<td>-.25</td>
<td>5.43</td>
<td>-.01</td>
<td>.00</td>
</tr>
<tr>
<td>Type 2 Insulin</td>
<td>8.12</td>
<td>4.98</td>
<td>.17</td>
<td>.02</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-1.10</td>
<td>3.86</td>
<td>-.03</td>
<td>.00</td>
</tr>
<tr>
<td>Age</td>
<td>-.31</td>
<td>.14</td>
<td>-.24*</td>
<td>.04</td>
</tr>
<tr>
<td>Type1 (Ref)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Type 2</td>
<td>-.86</td>
<td>5.26</td>
<td>-.02</td>
<td>.00</td>
</tr>
<tr>
<td>Type 2 Insulin</td>
<td>5.93</td>
<td>4.88</td>
<td>.12</td>
<td>.01</td>
</tr>
<tr>
<td>Distress</td>
<td>1.94</td>
<td>.68</td>
<td>.27*</td>
<td>.03</td>
</tr>
</tbody>
</table>

*p < .05

5.8.2 Self-compassion as a moderator of the link between distress and HbA1c

We began addressing this question by examining whether self-compassion predicted HbA1c. Confounds (age, gender and diabetes subtype) were entered in Step 1 as previously (see Model 1); with self-compassion entered at Step 2, the increase in explained variance was minimal and the model’s ability to predict HbA1c was not improved, $F(5, 104) = 2.25$, $R^2 \Delta = .0$, $F\Delta (1, 104) = .54$. 

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Next, and given the strong univariate relationship between self-compassion and diabetes-distress (see Table 5.2), we explored the possibility that self-compassion would moderate the effect of distress in predicting higher HbA₁c. As previously, control variables (age, gender and subtype dummy codes) were entered at Step 1. After entering distress, self-compassion, and the interaction between distress and self-compassion at Step 2 (see Table 5.4), the model now explained 19.8% of the variance in HbA₁c, \( F(7,102) = 3.60, R^2 \Delta = .11, F(\Delta 3,102) = 4.50, p < .05 \). Greater age and lower distress were related to lower HbA₁c, and the interaction between self-compassion and distress was also significant. Partial correlations controlling for age, gender and diabetes subtype showed a positive relationship between distress and HbA₁c among persons with lower self-compassion (\( M = 67.41, SD = 11.00 \)), \( r = .40, p < .05 \), but no relationship between these variables among patients with higher self-compassion (\( M = 93.56, SD = 9.91 \)), \( r = 0.08, p > .05 \). (High versus low self-compassion derived via a median split).

Table 5.4

<table>
<thead>
<tr>
<th>Statistics for multiple regression analysis showing self-compassion moderates the effect of diabetes distress on HbA₁c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
</tr>
<tr>
<td>Gender</td>
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<tr>
<td>Age</td>
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<tr>
<td>Type 1 (Ref)</td>
</tr>
<tr>
<td>Type 2</td>
</tr>
<tr>
<td>Type 2 Insulin</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Type 1 (Ref)</td>
</tr>
<tr>
<td>Type 2</td>
</tr>
<tr>
<td>Type 2 Insulin</td>
</tr>
<tr>
<td>Diabetes-distress</td>
</tr>
<tr>
<td>Self-compassion</td>
</tr>
<tr>
<td>Self-compassion x distress</td>
</tr>
</tbody>
</table>
5.9 Discussion

The purpose of the current study was twofold: first, to contribute to research seeking to identify the specific aspects of negative emotionality that best predict HbA1c and second, to explore the possibility that self-compassion might moderate the negative effects of distress on glycemic outcomes.

The suggestion that distress specifically related to feelings of being overwhelmed by or failing to cope with diabetes self-management routines would better predict metabolic control was supported in this study. While depression also predicted glycemic control in univariate analyses, distress specifically related to diabetes self-management was preferentially selected in the model because it was a stronger predictor of metabolic outcomes than depression. The fact that distress was the better predictor is consistent with the findings of Fisher et al (2010), who found both concurrent and time-concordant relationships between diabetes distress and HbA1c, but no relationship between major depression and metabolic control. One explanation for this may be that diabetes distress is related to the specific behaviours that likely impact on metabolic control, for example distress as a consequence failing to cope with diet and/or lifestyle prescriptions. On the other hand, depression may be related to more generalized negative affectivity which likely reflects and impacts a broader range of behaviours and functioning that includes, but is not limited to, those that are diabetes-related.

Findings regarding our second hypothesis, that self-compassion would predict metabolic outcomes, were mixed. While not related to HbA1c per se, the greater capacity to direct kindness towards oneself – self-compassion – did predict lower diabetes-distress that, in itself, predicted better metabolic control (see above). Perhaps more to the point, self-compassion buffered patients from the negative effects of distress on
HbA$_{1c}$; although distress predicted HbA$_{1c}$ in the less self-compassionate portion of the sample, it was not linked to metabolic control among patients with higher self-compassion. This “buffering” effect is consistent with recent research in which social support (arguably a form of kindness from others) reduced distress related to the burden of diabetes self-management (Baek, Tanenbaum, & Gonzalez, 2014) and buffered the effects of that distress on outcomes. The finding of the current study, therefore, supports the idea that a ‘one size fits all’ approach may not be helpful clinically, with individual difference variables (such as self-compassion) likely to effect the way in which a patient copes with the distress associated with their diabetes.

Although this finding is preliminary, and in need of replication, three interpretations of this effect are possible. First, when people who are high in self-compassion experience distress related to their diabetes self-management, they may be less likely to engage in self-criticism and unhelpful behaviors such as isolating and over-identifying with negative thoughts. A degree of self-compassion may help patients avoid getting caught in a downward spiral of self-perceptions and behavior that compromises their ability to maintain essential self-care regimes. Studies have shown that self-compassion leads to increased self-improvement motivations, possibly because self-compassion provides a nonjudgmental context in which to appraise one’s strengths and weaknesses and to strive to improve without the threat of self-criticism (Breines & Chen, 2012). In the context of diabetes, enhancing self-compassion may thus enable patients to respond to evidence of less-than-ideal metabolic or behavioral control without being paralyzed by self-criticism, permitting the reappraisal and adjustment of goals in support of good control. Prior research suggests that reacting to events with negative, self-focused emotions, such as shame, is associated with lower perceptions of self-efficacy (Turner, Husman, Schallert, & 2012), in turn suggesting that
people who are higher in self-compassion may have more positive perceptions of their abilities.

Second, people high in self-compassion have been found to take greater responsibility for their problems and be less overwhelmed by difficulties, suggesting they are more likely to take care of themselves when ill (Terry, Leary, Mehta, & Henderson, 2013). For diabetes patients, it may be that “taking care” of the self includes behaviors associated with good metabolic control such as maintaining regular physical activity, appropriate dietary choices, and regular self-monitoring of blood glucose.

Finally, it may be that people who are kinder to themselves are less physiologically aroused or “threatened” by the distress associated with repeated self-management failures. Potentially, the buffering effect of self-compassion on the processes by which distress impacts on HbA1c may reflect the superior autonomic and inflammatory processes shown to be associated with the practice of self-kindness (Katon, 2011; Terry et al., 2013; Golden, 2007). In one recent study, dispositional mindfulness (a core component of self-compassion) moderated the relationship between psychological distress and physiological stress reactivity, with distress associated with an elevated cortisol awakening response at low but not high levels of mindfulness (Daubenmier, Hayden, Chang, & Epel, 2014). The results of the current study are in line with the theoretical proposition that self-compassion may calm the threat system, reducing autonomic and immune responses that are thought to be similar to those involved in diabetes disease processes (Kristiansen & Mandrup-Poulsen, 2005).

In total, these data suggest that the tendency to be kind to oneself in the face of emotional distress may be associated with superior diabetes outcomes as measured by
The prevalence of negative affectivity among diabetes patients and its links to poorer metabolic control, as well as the lack of evidence that current treatment approaches predict consistent improvements in outcomes, suggest supplementary approaches to diabetes-related emotional distress may be useful. Self-compassion may be a valid target for clinical interventions in the context of a condition in which self-criticism and negative evaluations related to self-management performance are common themes.

5.10 Limitations and future directions

While these data represent a useful contribution to recent work linking negative affectivity to metabolic control and illuminate a possible target for intervention, they are not without their limits; most obvious is the use of a self-report scale for measuring self-compassion. As noted by Neff, (2003) a self-report measure will inevitably be limited in its ability to accurately assess individual levels of self-compassion because many people lack the awareness to recognise their own lack of self-kindness. Additionally, participants in this study were self-selected in that they chose to participate in a study investigating the benefits of self-compassion, so may in themselves be more open to the overall concept of kindness and not necessarily representative of diabetes patients more generally. A further measurement limitation of this study is the use of the DDS2, a short form measure used as the screening tool to detect diabetes-specific distress. While the DDS2 has strong psychometric properties and is substantially correlated with the full measure, future studies would nonetheless benefit from the use of the full-scale DDS self-report. Furthermore, as a cross-sectional study, directionality cannot be inferred, specifically in the relationships between self-compassion, distress and HbA$_1c$. We also note the limited ethnic diversity of this sample, and the predominance of New Zealand European participants. In light of studies
indicating clear differences in levels of distress by ethnic group, broader ethnic representation is also an important area to address in future studies. Finally, we note that co-morbidities and diabetes complications were not assessed in this study, a limitation that may contribute to the reported results.

These limitations noted, the suggestion from the current study that self-compassion may be related to better psychological and physical health in this patient population is promising and worthy of further investigation, particularly in light of the challenges of living with diabetes and the devastating consequences of poor control. Self-compassion is a both a tendency and a skill that can be developed or trained in patients, providing not only a tool with which to better handle the difficulties of living with diabetes, but one that may also provide some protection against poor glycemic outcomes. Future studies might investigate whether intervening to improve levels of self-compassion has an effect on key markers of effective control, including psychological, behavioural and physical health outcomes.

Acknowledgements

The authors acknowledge the support of the Waitemata District Health Board’s Diabetes Service, Auckland, New Zealand. Dr Nathan Consedine takes full responsibility for the contents of this article.
Chapter 6. Paradoxical Effects of Self-Compassion on Mood and Teeth Flossing Behaviour in an Experimental Setting

6.1 Preface

In addition to affirming the fact that a condition-specific metric (diabetes distress) was a better predictor of metabolic outcomes than a more general assessment of mood (i.e. depression), the previous chapter reported findings of a cross-sectional study demonstrating that dispositional self-compassion reduced the negative effect of diabetes-specific distress on elevated HbA1c. In other words, even though patients with diabetes reported high levels of distress, the relationship between distress and HbA1c among those who were higher in self-compassion was attenuated.

Although this represents a useful contribution to a fledgling field in diabetes research, a limitation of the cross sectional design is that assumptions of causality are not possible. Additionally, it is not possible to know if the observed effects were, in fact, specifically related to self-compassion per se, an inevitable and fundamental consequence of trait measurement. These limitations notwithstanding, the results reported in the previous chapter are consistent with the hypothesis that self-compassion may function as a protective resource, with implications for both mood and physical health. Furthermore, and as proposed in the theoretical model presented in Chapter 4, one possibility for the relationships observed in the previous study may be a result of increased motivation to maintain essential self-care behaviour as a consequence of greater self-compassion. While the cross-sectional design prevents assumptions in this direction, the positive (moderating) effects of self-compassion on the relationship between mood and physical health through, as yet, unknown processes suggests the utility of further research in this direction.

Furthermore, results reported in the previous chapter are conceptually consistent with evidence that psychological distress is a major threat to an individual's...
capacity to effectively self-regulate (Wagner & Heatherton, 2015). In turn, this reasoning creates the possibility that individuals higher in self-compassion have a greater capacity to maintain equilibrium in response to distress. If substantiated in future work, such a finding would have important health implications in terms of freeing up self-regulatory resources to apply to positive health behaviour (Sirois, 2014; Terry & Leary, 2011).

Evidence that self-compassion consistently predicts greater practice of a range of positive health behaviors including healthy eating, regular physical activity, stress management, and positive sleep habits has been demonstrated in a number of studies (for review, see Sirois, Kitner & Hirsch, 2015). While discussed more extensively in the following section, a meta-analysis showed self-compassion was positively associated with health-promoting behaviors across all included studies ($n = 15$), albeit with a small average effect size ($r = .25; p < .001$), (Sirois, et al.).

Additionally, self-compassion may help people overcome the negative emotional responses that often follow perceived failures. Evidence suggests that failing to meet personal health goals often triggers feelings of shame and guilt, which can promote goal disengagement rather than persistence (Sirois & Giguere, 2013). Thus, intervening to increase self-compassion may be hypothesized to have the opposite effect on health behavior, producing improvements. While self-compassion is generally seen as a relatively stable trait (Neff, 2009), evidence that increases in self-compassion can be achieved through training is accumulating (for example, Neff & Germer, 2013; Smeets, Neff, Alberts, & Peters, 2014).

To date, however, self-compassion interventions have focused mainly on reducing risky health behaviors such as overeating (Adams & Leary, 2007), and smoking (Kelly, Zuroff, Foa, & Gilbert, 2010), rather than increasing “positive” health
promoting behaviours. However, with increasing evidence that self-compassion might be helpful in protecting against the negative emotional responses accompanying failure - with its implications for self-regulation and behavior (Sirois, 2014; Sirois, et al., 2015) – experimenting with the effects of a brief self-compassion intervention on positive health behaviour is warranted. As was noted earlier in this thesis, investigating the potential utility of self-compassion as a buffer against effects of negative emotionality on health behaviour may have important implications for diabetes patients in particular, a group in which emotional and behavioural responses to perceived self-management ‘failures’ may be common and detrimental.

Thus, with evidence that self-compassion can be increased through training and via inductions (for example, Neff & Germer 2013; Smeets, et al., 2014) the following chapter describes the effects of a laboratory study investigating how a brief self-compassion induction, compared to a self-critical intervention, impacts on mood and motivation to maintain a common health behaviour (tooth flossing) after evidence of failure. The following chapter reports a study that has been published in *Mindfulness*.

**Citation**

6.2 Abstract

Dispositional self-compassion has been linked to better mood and better health behaviors in numerous studies, albeit in cross-sectional designs employing self-report measurement. This study \( n = 42 \) experimentally evaluated how a self-compassion (versus self-criticism) manipulation impacted patterns of positive and negative emotion, tested whether it increased health behavior (flossing) and motivation to floss following negative feedback, and assessed whether changes in emotion predicted changes in behavior. As expected, there was greater positive and less negative mood following the self-compassion induction, but only temporarily; there were no buffering effects of the self-compassion intervention on mood after critical external feedback. In contrast to expectation, self-compassion predicted lower floss time and did not impact motivation to floss in future. These findings suggest that while being kind to oneself instead of self-critical may promote better mood, it may be less effective in motivating certain health behaviors like teeth flossing, at least in an experimental setting.

6.3 Introduction

Self-compassion has been linked to better psychological health and thriving as well as having an inverse relationship to negative states such as depression, anxiety, and stress (Brion, Leary, & Drabkin, 2013; Macbeth & Gumley, 2013; Neff, 2003a; Terry, Leary, Mehta, & Henderson, 2013). As originally conceptualized self-compassion comprises three elements: the mindful acceptance of one's present moment experience, recognizing the universality or common humanity of suffering, and the capacity to be kind and understanding to oneself in the face of difficult emotions (Neff, 2003a). Behaviorally, dispositional self-compassion has been linked to better goal setting and action taking (Leary, Tate, Adams, Batts Allen, & Hancock, 2007), improved adherence to exercise regimes (Magnus, Kowalski, & McHugh, 2010), and to fewer health risk
behaviors such as smoking (Kelly, Zuroff, Foa, & Gilbert, 2010). People with greater self-compassion are thought to be more motivated to act in ways aligned to their long-term interests, such as seeking medical help quickly when discovering symptoms and adhering to prescribed medications (Terry, et al., 2013). However, because most studies linking persons higher in self-compassion with greater happiness and an increased likelihood of positive action towards health-related goals are cross-sectional, it is unclear whether self-compassion is causally linked to better physical and mental health. Furthermore, it is unclear as to what psychological mechanisms might underpin such a link.

Emerging research suggests people higher in self-compassion may be more likely to act in ways consistent with their best long-term interests, although other studies suggest that self-criticism may also motivate positive action. On one hand, a series of experimental studies found that college students randomized to respond to a perceived failure with self-compassion reported greater motivation to grow and learn from mistakes and showed greater persistence and goal re-engagement after failure, with more time spent studying following an initial test failure (Breines & Chen, 2012). These findings are consistent with an earlier study in which self-compassion was induced in a group of women on controlled diets (Adams & Leary, 2007). Compared to two control groups, participants in the self-compassion group reported being more likely to return to their diets after an experimental break in their eating plan, an event that often triggers an increase in subsequent food intake (Hermann & Mack, 1975).

Importantly, this effect was found only among restricted eaters, with no effect of the self-compassion intervention on the subsequent eating behavior of non-dieters. It is therefore possible that the effect of self-compassion may be more pronounced in certain types of people, for example, those who are more motivated to change health-
related behavior, such as dieters, and/or those who are more prone to being self-critical when they ‘fail’. Another study also showed self-criticism moderated the effects of a self-compassion intervention designed to help people stop smoking, with more rapid reductions in smoking seen among the more self-critical participants (see Kelly, et al., 2010). In theory, however, self-compassion may help people see a temporary aberration in behavior - such as ‘slipping’ when on a diet plan - in the context of one’s ‘common humanity’ (everyone makes mistakes), enabling them to be kinder and/or less self-critical and thus less paralyzed by negative feelings, enabling more immediate task re-engagement.

On the other hand, there are many situations, including in health, in which experiencing negative emotions as a result of a problem or failure is adaptive, increasing awareness of a lapse, goal deviation, or problem, and motivating actions that are designed to avoid further failures, self-criticism, or shame (Consedine & Moskowitz, 2007). Thus, in contrast to the approach described above, it is also possible that the greater tolerance for difficult feelings noted among people higher in self-compassion might predict lower motivation, at least in the short term, because the motivation to reduce unpleasant negative affect via health-promoting behavior is reduced or absent (Thompson & Waltz, 2008). Indeed, dispositionally more self-compassionate persons, or at least those randomized to self-compassion conditions, might mindfully notice and soothe themselves when uncomfortable feelings of failure arise, more easily forgiving themselves and thus have a less pressing internal need to problem solve or attempt to fix the behavior that led to the negative self-evaluation (Shepherd & Cardon, 2009).

The relative absence of experimental work means the question of causality regarding reported behavioral differences between people higher versus lower in self-compassion remains unclear. While prior experimental studies have evaluated the
impact of self-compassion based interventions outcomes have typically been self-reported and it is often difficult to determine mechanisms of change (Kelly, et al., 2010; Smeets, Neff, Alberts, & Peters, 2014).

The current study contributes to this fledgling literature by assessing (1), whether a brief self-compassion induction, compared to a self-critical condition, predicts objectively measured change in a common health behavior, time spent teeth flossing. A primary assumption of this study is that differences in time spent flossing following an initial 'failure' may be a proxy for increased motivation to floss (c.f., Breines & Chen, 2012). Furthermore, the study assesses whether a self-compassion induction will predict; (2) lower negative affect; (3) greater positive affect and; (4) greater motivation to floss following critical external feedback.

6.4 Method

6.4.1 Participants

Participants ($n = 42$, see Table 6.1) were recruited via the University of Auckland’s email announcements system and via social networking sites. Participants were told they would be participating in a laboratory experiment investigating the effects of mood on behavior and would receive a $20$ shopping voucher upon completion of a 40-minute lab session. Inclusion criteria required being aged between 18 and 65 and English fluency. There were no exclusion criteria.

6.4.2 Procedure

Experimental: After providing written consent, participants were given an identification number and 48 participants were alternately assigned to either a self-compassion condition or a self-critical comparison condition, described below, in order of their enrolment into the study. Participants were blind to condition. All participants completed Demographics and Health Behavior questionnaires and the Self-Compassion
Scale online, and were given a time for their laboratory session. In the self-compassion condition, 23 participants attended their laboratory session, with two failing to attend, and 19 participants assigned to the self-critical condition attended, with four failing to attend. On arrival at the laboratory, participants were greeted by a female researcher wearing a white lab coat and were escorted to a clinic room equipped with a small desk, a hand basin and mirror, and a small video camera on a tripod. A medical trolley with teeth flossing thread, a cup, and mouth-wash was positioned beside the basin. After seating, participants completed a first check on state self-compassion and current emotion (Time 1).

All participants then completed a three-minute writing exercise designed to evoke feelings of shame or disappointment by recalling an event in which they felt bad, guilty, or a sense of disappointment or failure (adapted from Breines & Chen, 2012; Terry & Leary, 2007). A second check on current emotion (a measure of state positive and negative affect as a proxy measure of state self-compassion, see Measures below) immediately followed (Time 2).

At this point, participants assigned to the self-compassion group were instructed to write a letter to themselves about the incident or “failure” from the “perspective of a kind and understanding friend, recognizing that everyone feels they have failed at some time”. By contrast, persons assigned to the self-critical group were asked to write a letter about the event from a critical and judging perspective. A third measure of state emotion was then administered (Time 3). Participants were then asked to use the materials provided to “floss their teeth as they would do normally at home” (Motivation Measure 1). They were told that their flossing efforts would be filmed and reviewed in real-time by a dentist in an adjacent room and that feedback would be provided. No dentist was in fact present and a standardized sheet criticizing
flossing performance was delivered to all participants. Floss times were discretely recorded during the task. Immediately following their receipt of the critical feedback, participants were asked if they wished to floss a second time using a fork-flossing instrument in an “attempt to improve their technique” (Motivation Measure 2). Participants’ ‘yes’ or ‘no’ responses to this question were recorded. A final self-compassion and emotion check was completed. A comprehensive debriefing was provided at the completion of the laboratory session, see Figure 6.1. Letters written by participants were destroyed.
Baseline Questionnaires completed online. Participants \((n = 42)\) alternately assigned to condition

Lab session: Emotions Check Time 1

Shame Induction – 3 minute writing exercise
“Think about something that you do or have done that makes you feel ashamed or disappointed in yourself. Please write that down in a few sentences”.

Emotions Check Time 2

Self-Critical intervention \((n = 19)\) – 8 min writing exercise
“Imagine you are talking to yourself about what you have written from a harsh, judgmental and self-critical perspective.” Prompts were given:
- Detail the specific aspects of what you wrote about that concern you the most
- Express how you might specifically criticize yourself
- What might other people say about you if they knew?

Self-Compassion intervention \((n = 23)\) – 8 min writing exercise
“Imagine you are talking to yourself about what you have written from a kind, concerned and understanding perspective.” Prompts were given:
- Express how you might try to be kind and understanding to yourself about what you wrote
- Express how you might try to keep what you wrote about in perspective

Emotions Check Time 3

Teeth flossing exercise (Motivation Measure Time 1)
Participants were asked to floss their teeth as they would if they were at home. The researcher set up the camera, informing the participant that a dentist would be watching them via live streaming footage, and would give them feedback on their technique.

Emotions Check Time 4

Negative feedback and flossing fork (Motivation Measure Time 2)
Participants were given a feedback sheet with various factors of their flossing performance deemed to be either satisfactory or unsatisfactory. All participants received the same feedback, and a final comment that their “current technique was unlikely to be effective”. They were then asked if they would like to re-floss using a flossing fork.
6.5 Measures

6.5.1 Demographics and health behaviour questionnaire
This questionnaire assessed age, gender and ethnicity as well as frequency and length of normal tooth flossing habits at home.

*Trait Self-Compassion:* The *Self-Compassion Scale (SCS)* (Neff, 2003) is a 26-item measure that uses a 1 (*Almost never*) to 5 (*Almost always*) metric to assess positive subscales of self-kindness, common humanity and mindfulness, and negative subscales of self-judgment, isolation and over-identification. Studies have demonstrated satisfactory psychometric properties and good test-retest reliability (Raes, Pommier, Neff, & Van Gucht, 2011; Neff, 2015). Factor analysis has confirmed the six-factor structure of the scale and the single higher-order component of self-compassion. For the current study, self-compassion was operationalized as the *overall* trait self-compassion score, the sum of the six subscales outlined previously. Reliability was sufficient in the current sample (alpha = .86).

6.5.2 State affect
A 10-item questionnaire asked participants to rate current mood using six negative affect adjectives (NA = stressed, ashamed, sad, worried, tired, embarrassed) and four of positive affect (PA = calm, content, happy, patient). Each item was scored on a 6 point scale with 1 = Not at all, through to 6 – A Lot. Aggregate scores for items on both NA and PA subscales were calculated. Cronbach alpha coefficients were for Time 1 NA = .87; PA = .77; Time 2 NA = .92; PA = .73; Time 3 NA = .87; PA = .80; and Time 4 NA = .96; PA = .83.

6.5.2.1 Motivation Measure 1: Initial Floss Time
Motivation Measure 1, operationalized as time spent flossing teeth following instruction to “floss teeth in your normal way” was recorded in minutes.
Motivation Measure 2: Subsequent Opportunity to Floss

Motivation Check 2 was operationalized as a ‘yes’ or ‘no’ answer to the question:

“Would you like to floss your teeth a second time using a flossing fork?”
Table 6.1

Statistics for baseline characteristics and experimental floss-related behavior

<table>
<thead>
<tr>
<th>Baseline measures</th>
<th>Self-compassionate group (n = 23)</th>
<th>Self-critical group (n = 19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender Mean (SD)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>10 (43.5%)</td>
<td>7 (36.8%)</td>
</tr>
<tr>
<td>Females</td>
<td>13 (56.5%)</td>
<td>12 (63.2%)</td>
</tr>
<tr>
<td>Age Mean (SD)*</td>
<td>24.95 (6.65)</td>
<td>23.73 (6.0)</td>
</tr>
<tr>
<td>Ethnicity Mean (SD)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Zealand European</td>
<td>11 (47.8%)</td>
<td>10 (52.6%)</td>
</tr>
<tr>
<td>New Zealand Maori</td>
<td>1 (4.3%)</td>
<td>1 (5.3%)</td>
</tr>
<tr>
<td>Asian</td>
<td>8 (34.8%)</td>
<td>5 (26.3%)</td>
</tr>
<tr>
<td>Other</td>
<td>3 (13.0%)</td>
<td>3 (15.8%)</td>
</tr>
<tr>
<td>Trait Self-Compassion Mean (SD)*</td>
<td>2.82 (0.40)</td>
<td>2.96 (0.49)</td>
</tr>
<tr>
<td>Baseline flossing behavior Mean (SD)*</td>
<td>3.35 (1.37)</td>
<td>3.79 (1.18)</td>
</tr>
</tbody>
</table>

(1 = twice daily; 2 = daily; 3 = twice a week; 4 = weekly-monthly; 5 = never)

Experimental measures of motivation

| Measure 1: Experimental floss time (in minutes) Mean (SD)** | 2.88 (1.42) | 3.63 (1.22) |
| Measure 2: Deciding to use flossing fork*                  |             |             |
| Yes n (%)                                                 | 18 (78.3%)  | 13 (68.4%)  |
| No n (%)                                                  | 5 (21.7%)   | 6 (31.6%)   |

**p < .05 (see results section, Model 3)
*p > .05 (see results section, Model 4)
6.6 Data analyses

All data were screened for assumptions of normality. Commensurate with our research foci, analyses proceeded in three basic phases. First, to test our hypotheses that a brief self-compassion intervention would improve participants’ mood, parallel Time x Group mixed model ANCOVAs with repeated measures were used to test for differences in NA (Model 1) and PA, (Model 2) (Time 1 = baseline, Time 2 = post shaming, Time 3 = post self-compassion/self-critical intervention, Time 4 = post critical feedback). Because trait self-compassion is closely tied to emotional responding (Neff, 2003) and trait variables may influence the impact of interventions (Shapiro, et al., 2011) trait self-compassion was included as a covariate. The six sub-scales of the SCS were also examined in preliminary analyses for each model described below. A similar pattern of results was recorded for each of the subscales as for the total SCS score, hence results are reported using total scores only. T-tests were used to confirm observations from plot inspections.

Second, to test the hypothesis that a self-compassion manipulation would predict increased floss time, an ANCOVA, with trait self-compassion as a covariate, contrasted floss times between the two groups, see Model 3. Third, chi-square was used to test our final hypothesis that the self-compassion manipulation would result in a greater willingness to floss after critical feedback, see Model 4. Finally, two-tailed Pearson correlations were used to examine relationships between state affect and floss times separately for each of the two groups, see Model 5.

6.7 Results

6.7.1 Changes in negative affect (Model 1)

A mixed model Time x Group ANCOVA with repeated measures and trait self-compassion as a covariate tested NA scores at the four time points (T1, T2, T3, T4). There
was no main effect of time, \( (F(3,37) = 1.50, p > .05) \), or group, \( (F(1,39) = .04, p > .05) \), in this model. There was, however, an interaction between group and time \( F(3,37) = 11.20, p < .001, \eta^2 = .48 \) (see Figure 6.2). T-tests confirmed differences in NA between each time point for the self-compassion group. For the self-critical group, there were differences between Time 1 and Time 2, and Time 2 and Time 3, but not between Time 3 and 4. There were no *between group* differences at any point, see Table 2. Plot inspection showed both groups reporting increased NA after the shaming manipulation between Time 1 and Time 2, and then diverging at Time 3 following the self-compassion/self-critical manipulation. Participants in the self-compassion group reported *decreased* NA after the manipulation while NA *increased* in the self-critical group. For the self-compassion group these changes did not last with NA increasing again at Time 4 (after receiving critical feedback on flossing behavior), versus no change in NA for the self-critical group.

![Figure 6.2. Negative Affect across the four experimental time points with error bars calculated as SD. NA for the self-compassion group increased between T1 and T2, decreased between T2 and T3, and increased between T3 and T4 (p < .05) NA for self-critical group increased between T1 and T2 and between T2 and T3 (p < .05).](image)

### 6.7.2 Changes in positive affect (Model 2)

A second ANCOVA with repeated measures and trait self-compassion as a covariate tested the effect of the self-compassion and self-critical interventions on PA across the
four time points ((T1, T2, T3, T4). There was no main effect of group, (F(1,39) = .03, p > .05) but there was an overall effect of time $F(3,37) = 3.01, p < .05, \eta^2 = .20$, as well as an interaction between group and time, $F(3,37) = 7.58, p < .001, \eta^2 = .38$ (see Figure 6.3). Further analysis showed PA decreased for the self-compassion group between Time 1 and Time 2, and increased between Time 2 and Time 3. PA for the self-critical group decreased between Time 2 and Time 3. There were no differences between Time 3 and Time 4 for either group and no between group differences at any time point.

![Figure 6.3. Positive Affect across the four experimental time point with error bars calculated as SD. PA for the self-compassion group decreased between T1 and T2, and increased between T2 and T3 (p < .05). PA for self-critical group decreased between T2 and T3 (p < .05).](image-url)
Table 6.2
Statistics and results of t-tests for Negative Affect (NA) and Positive Affect (PA) between Time 1 (T1), Time 2 (T2), Time 3 (T3) and Time 4 (T4).

<table>
<thead>
<tr>
<th></th>
<th>NA</th>
<th></th>
<th>PA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self-Crit M (SD)</td>
<td>Self-Comp M(SD)</td>
<td>Self-Crit M (SD)</td>
<td>Self-Comp M(SD)</td>
</tr>
<tr>
<td>T1</td>
<td>1.40 (.46)</td>
<td>1.70 (.83)</td>
<td>4.50 (.79)</td>
<td>4.36 (.84)</td>
</tr>
<tr>
<td>T2</td>
<td>1.88 (.73)</td>
<td>2.27 (.12)</td>
<td>4.34 (.72)</td>
<td>3.93 (.92)</td>
</tr>
<tr>
<td>T3</td>
<td>2.13 (.84)</td>
<td>1.87 (.78)</td>
<td>3.90 (.84)</td>
<td>4.18 (.88)</td>
</tr>
<tr>
<td>T4</td>
<td>2.10 (.95)</td>
<td>2.10 (.92)</td>
<td>3.86 (.89)</td>
<td>4.05 (.89)</td>
</tr>
<tr>
<td>t-tests</td>
<td>T2 - T1, t(18) = 3.13*</td>
<td>T2 - T1, t(22) = 3.63**</td>
<td>T2 - T1, t(18) = -1.20</td>
<td>T2 - T1, t(22) = -3.72**</td>
</tr>
<tr>
<td></td>
<td>T3 - T2, t(18) = 2.84*</td>
<td>T3 - T2, t(22) = -3.70**</td>
<td>T3 - T2, t(18) = -4.56***</td>
<td>T3 - T2, t(22) = 2.19*</td>
</tr>
<tr>
<td></td>
<td>T4 - T3, t(18) = -.26</td>
<td>T4 - T3, t(22) = 2.24*</td>
<td>T4 - T3, t(18) = -.26</td>
<td>T4 - T3, t(22) = -1.54</td>
</tr>
</tbody>
</table>

*** p < .001, ** p = .001, * p < .05
6.7.3 Impact of self-criticism and self-compassion on flossing behaviour and subsequent motivation (Models 3 and 4)

An ANCOVA with trait self-compassion as a covariate tested the hypothesis that a brief self-compassion manipulation would result in greater flossing time (Model 3). Results showed a marginal main effect of group $F(1,39) = 4.06, p = .05$, $\eta^2_p = .09$, but no effect of the covariate, $p > .05$. In contrast to prediction, however, people in the self-critical group flossed their teeth for longer than those in the self-compassion group. A chi square test for group differences in the proportion of participants reporting being willing to attempt a second flossing after receiving critical feedback (Model 4) showed no group differences between the groups, $\chi(1) = .52, p >.50$, see Table 6.1.

6.7.4 Testing possible explanations for group differences in flossing behaviour (Model 5)

To further explore the unexpected group difference in floss time found above, see Model 3, correlations assessing the relationships between positive and negative affect and behavior were run independently for each group. For the self-compassion group, there was a moderate, positive relationship between floss time and NA assessed immediately prior to the flossing task at Time 3 ($r = .42, p < .05$), but no relationship between floss time and either NA or PA at any other time point. Conversely, there were no relationships between affect and behavior at any time point for the self-critical group.

6.8 Discussion

This study tested whether a brief self-compassion manipulation would improve mood and subsequent health behavior following a manipulated “failure” in teeth flossing, a common but often neglected health behavior. While PA increased and NA decreased following the instructions to ‘write to oneself from a friendly and kind perspective’, negative feelings increased again following critical feedback about flossing behavior.
For the self-critical group, the instructions to write a letter ‘from a critical and judging perspective’ resulted in an increase in NA and a decrease in PA, again suggesting an immediate effect of the manipulation, with no further changes recorded in these measures of state affect.

In contrast to expectation, however, the self-compassion induction predicted lesser floss time relative to the self-critical condition; there were no differences in the adoption of a second (subsequent) opportunity to floss. Further analyses revealed an association between floss times and NA assessed immediately prior to the behavioral test, but only in the self-compassion condition suggesting a complex relationship between affect and health behavior in the two groups. Below, we revisit these findings in light of the small literature linking self-compassion to health outcomes, consider possible explanations for our findings regarding mood and subsequent health behavior, and offer directions for future research.

Firstly, results of the current study are consistent with previous findings indicating improved mood following self-compassion interventions (Friis, Johnson, Cutfield, & Consedine, 2016; Neff & Dahm, 2013). As predicted, participants randomized to the self-compassion condition, who were instructed to relate to their perceived failings and inadequacies with kindness and understanding, reported a decrease in negative emotion while those who were instructed to relate to their failure critically, reported an increase. Reports of positive emotionality showed the opposite pattern; those in the self-compassion condition reported an increase in positive emotion, while those in the self-critical condition reported a reduction, see Models 1 and 2.

Conversely, however, findings from this experimental study were not consistent with prior, cross-sectional literature reporting a greater likelihood of positive self-care
among more self-compassionate people. Previous research has linked dispositional self-compassion to greater intention to engage in health-promoting behaviors (Terry, et al., 2013) and to reports of lower health risk behaviors (Adams & Leary, 2007; Kelly, et al., 2010); self-compassion is purported to ameliorate the negative emotional states that may jeopardize health goals. It has been suggested, for example, that frustration or depression may lead people to abandon exercise routines or seek unhealthy short-term gratification as a means of regulating mood. In theory then, self-compassion may provide a means of soothing negative affect and thus helping people maintain goals aligned with good health (Friis, et al., 2015; Sirois, Kitner, & Hirsch, 2015).

In the current study, however, it was participants in the self-critical condition, among whom negative feelings such as embarrassment, guilt and shame were stimulated, who flossed their teeth for longer, supposedly under a dentist’s scrutiny via a real-time video recording, see Model 3. Drawing from an extensive emotions literature one explanation for this finding may simply be that negative feelings such as guilt, embarrassment, and shame serve powerful adaptive functions, alerting people to the fact that behavior is discrepant with one’s own or with social standards and motivating action to bring the self back into alignment with norms (Consedine & Moskowitz, 2007). As this report is among the first to experimentally compare the effects self-compassion and self-criticism on health behavior, our findings may imply that self-critical emotions are a better motivator of common health behaviors such as tooth flossing than self-compassion, at least in a laboratory setting. Equally, the absence of differences in the proportion indicating an interest in a second flossing opportunity may be taken as evidence for the absence of group differences in motivation, a finding that is again consistent with the interpretation that the capacity
for negative self-evaluation may serve a useful motivational function in health, at least for tooth flossing.

Although flossing is an important health behavior that is important, regular, frequently neglected and well-suited to a laboratory paradigm, it is unclear whether these effects will arise in other areas. There are likely differences in the type and strength of the emotions associated with teeth flossing “failures” compared to, for example, the shame associated with dietary lapses for a rigid eater (Adams & Leary, 2007), over-eating (Ferreira, Trinade, & Ornelas, 2015), or the guilt linked to smoking (Brown-Johnson & Popova, 2016). Given self-compassion involves tending to one’s suffering in a kindly way, it may be less relevant in the context of flossing because harsh judgment or self-criticism are normatively absent or minimal.

More broadly, there may be important differences in the types of emotional, motivational, and self-regulatory processes underlying health risk behaviors such as smoking and drinking, relative to those that drive health promoting behaviors such as flossing, exercising or use of sunscreen (Schwarzer, 2008; Hall, & Fong, 2010). As such, a “failure” to enact preventative behaviors may well be distinct from engagement in health risk behavior in a number of important ways that warrant further investigation. Such considerations suggest the findings of the current study may be specific to flossing - or other promotion-type behaviors - and extrapolations to other domains of behavior should be conducted with care.

Thirdly, exploratory analyses suggested that shorter floss time among the self-compassion group was associated with prior levels of negative emotionality, see Model 5. This finding may help broaden thinking regarding the role that negative affect serves in the systems of more versus less self-compassionate persons. A recent meta-analysis of 15 cross sectional studies showed that the capacity of self-compassionate people to
soothe difficult feelings was linked to a focus on healthy behavior, with self-compassion hypothesized to protect against negative emotions and encouraging positive emotions linked to motivation to maintain the pursuit of health goals (Sirois, et al., 2015). In the current study, while persons in the self-compassion condition reported less NA and a lower floss time, floss times were correlated with negative affect. One interpretative possibility worth considering with respect to these complex findings is found in the cancer screening literature. Data in this line (e.g., Consedine, Morgenstern, Kudadjie-Gyamfi, Magai, & Neugut, 2006) suggest that negative emotions such as cancer worry predict greater screening at moderate levels, but not at higher or lower extremes – in some instances the relationship appears curvilinear. In the current study then, it is possible that the higher negative emotionally reported among those in the self-critical condition may have been at the upper end of the spectrum and thus had a disorganizing effect on behavior overall, with people flossing more in total, but not in a manner that was systematically connected to felt emotion.

6.9 Limitations

Although these data provide a useful experimental contribution to the understanding of how self-compassion may relate to some health behaviors, they are not without limitations. A first limitation regards the validity of flossing as a health behavior proxy. Although it is, by definition, a health behavior, flossing may have been interpreted as a performance task in the laboratory context of this study. People higher in self-compassion are thought to be more motivated to achieve for intrinsic reasons related to wanting to learn and grow and less because they need social approval or to enhance their self-image (see Neff review, 2012). It is thus possible that being told they would be flossing under the scrutiny of a dentist was interpreted as a performance task, with
behavior in the self-critical condition being driven by a desire to avoid negative - or other - self-judgment.

Conversely, those in the self-compassion group may have a relative lack of this type of motivation, with the self-compassion intervention giving participants the safety or ‘permission’ to stop flossing after a certain point, without fear of their own recrimination or a sense that they had somehow ‘failed’ a test. Such an interpretation is consistent with data (Neff, Kirkpatrick, & Rude, 2007) showing that people higher in self-compassion are more able to acknowledge weakness or failure, without recrimination or anxiety. Equally, it is possible that there are groups of people for whom flossing may be more important than for others and/or for whom unsuccessful flossing would therefore elicit especially difficult feelings. A self-compassion intervention might therefore be more relevant in the context of flossing for those who experience shame or guilt around failures to floss. The current study did include a measure of baseline flossing frequency, for which there were no group differences, but did not differentiate between those for whom teeth-flossing was highly personally important and those for whom it was not. It should also be noted that the measure of motivation chosen for this study, i.e., time spent flossing one’s teeth, may not equate with better flossing quality. Finally, as greater negative affect has been shown to make it more difficult to perform tasks, particularly effortful tasks, higher negative affect and/or lower positive affect may in fact decrease flossing efficiency and therefore increase the time spent in pursuit of task fulfillment (Wang, et al., 2014).

A further limitation of the study is the lack of a pre-post measure of state compassion to use as a manipulation check. While the study measured changes in positive and negative affect at each of the four experimental time points, we
acknowledge that this is not the same as measuring changes in self-compassion, which relates specifically to how people treat themselves in times of suffering.

More broadly, the absence of a neutral control group restricts interpretations. Including such a group would have enabled an assessment of the effects of no intervention following a shame induction, in addition to evaluating those associated with self-criticism and self-compassion. It is possible that tooth flossing is insufficiently challenging as a self-caring or health-related task. A more demanding task such as an exercise or blood self-test, or adherence to a medication regime such as would be required in a patient population, may have elicited different responses and will be important to evaluate in the future. Finally, this study used a one-off dose of self-compassion and measured the health behavior that immediately followed. Given the effect on mood of a brief dose self-compassion did not last, it will be important to test increased time and dose responses and their ongoing effects on behavior in both healthy and patient populations.

**Compliance with Ethical Standards**

The study was funded by the University of Auckland as part of the doctoral studies of first author AF. The study received approval from the University of Auckland Human Ethics Committee, and complies with ethical standards.
Chapter 7. Kindness Matters: A RCT of a Mindful Self-compassion Intervention Improves Depression, Distress, and HbA$_1c$ Among Diabetes Patients

7.1 Preface

The previous chapter described an experiment designed to test the effects of a brief self-compassion intervention on both mood and behaviour among healthy volunteers. In the context of the overall thesis, this test was an important first step in beginning to test whether self-compassion's effects on health might follow changes in health behaviour as well as to examine the effects of ‘dose’ on mood, at least in a laboratory setting. As noted, the brief self-compassion induction had a temporary effect on mood, with greater positive affect (and less negative affect) recorded in the self-compassion condition compared to the self-critical condition. The induction did not, however, protect against a subsequent increase in negative emotionality following critical feedback. Furthermore, the eight-minute intervention did not result in greater time spent flossing teeth, a proxy measure for greater motivation to maintain a common health behaviour.

While interpretive possibilities have been previously discussed (see Chapter 6, Section 6.8), the findings from the laboratory study raise two important questions relevant to the presentation of the following study. Firstly, while the brief intervention had an effect on mood, this effect did not last. Interpretatively, it may be that the brevity (i.e., the eight minutes) of the manipulation is responsible for the failure of the intervention to effect longer-term mood or behaviour. Specifically, it is possible that the intervention was simply not of sufficient length for participants to experience any sort of ‘protection’ against subsequent effects of critical feedback on their mood. Furthermore, its failure to effect mood in any sustainable way may then explain the failure of the experiment in terms of the hypothesized flow-on effects on teeth-flossing.
behaviour. RCT data show that it is possible to produce longlasting effects on mood although this may require training over a longer time frame (Neff & Germer, 2013). In this trial contrasting an eight-week mindful self-compassion (MSC) intervention to a waitlist control, MSC training increased participants’ self-compassion and reduced self-reported depression, with gains maintained one year later. Notably, analyses indicated that self-compassion increased from pretest to Week 3, and from Week 3 to Week 6 of the training ($p's < .01$), and then remained stable from the Week 6 assessment to the post test, 6 month and 1 year follow up assessments ($p's > .05$). Other analyses showed a “dose-response” effect, with increases in self-compassion related to the amount of practice undertaken by participants, using either formal or information self-compassion practices taught during the course ($r = .43, p < .05$). Taken together, these findings suggest it may take several weeks of intervention and practice to get sustainable effects on mood. Experimentation with a longer intervention, such as that described in the following chapter, may therefore be necessary to provide benefit.

A second question derives, in part, from findings of the cross-sectional study described in Chapter 5: participants with greater trait self-compassion reported less depression and distress as well as demonstrating a degree of resilience to the negative effect of distress on HbA1c. In other words, better mood was associated with better metabolic health, with self-compassion moderating the relationship. These results are important when considered in tandem with the experimental study reported in Chapter 6, because they suggest that self-compassion does have a protective effect on mood (and its biological consequences), at least among diabetes patients, even though evidence for this effect was not found in the experimental study among healthy volunteers. Therefore it is possible that self-compassion may work differently among a
patient population such as persons with diabetes – a condition in which self-criticism (the opposite of self-compassion) is prevalent (Barnard & Lloyd, 2012).

In light of these findings, the following chapter takes the reader out of the laboratory and into a real-world setting, testing the effects of an eight-week mindful self-compassion training programme in a population of Type 1 and Type 2 diabetes. In the context of this doctoral thesis overall, the report thus provides a critical test of whether or not self-compassion can be trained as a trait-like characteristic, thus providing sustainable protection against low mood and its on-going metabolic consequences in diabetes patients. As discussed (Chapter 2), there is no prior evidence of psychosocial interventions that have a concurrent, sustained effect on both mood and metabolic outcomes in diabetes patients. However, drawing on the theoretical model for effects of self-compassion among diabetes patients presented in Chapter 4, and the results of the cross-sectional study (Chapter 5) there is reason to expect that self-compassion may be of particular utility among diabetes patients.

In this light, the following chapter presents the results of an eight-week randomised controlled trial in which a mindful self-compassion intervention was compared to a wait-list control group among persons with diabetes. Consistent with expectations, the training had an effect on both mental and physical health outcomes, among the first psychosocial interventions among diabetes patients to show these results.

Citation

7.2 Abstract

Objective: Mood difficulties are common among diabetes patients and are linked to poorer blood glucose control and increased complications. There is limited evidence for psychological treatments that improve both mood and metabolic outcomes. Greater self-compassion predicts better mental and physical health in both healthy and chronically-ill populations. Thus, the purpose of this randomized controlled trial (RCT) was to evaluate the effects of self-compassion training on mood and metabolic outcomes among diabetes patients.

Research Design and Method: This RCT tested the effects of a standardized 8-week mindful self-compassion (MSC) programme \((n = 32)\) relative to a waitlist control \((n = 31)\) among Type 1 and Type 2 diabetes patients. Measures of self-compassion, depressive symptoms, diabetes-specific distress, and HbA1c were taken at baseline (pre-intervention), at week 8 (post-intervention), and at 3 months follow up.

Results: Repeated-measures ANOVAs using intention-to-treat showed that MSC training increased self-compassion and produced statistically and clinically significant reductions in depression and diabetes-distress in the intervention group, with results maintained at 3 month follow-up. MSC participants also averaged a clinically and statistically meaningful decrease in HbA1c between baseline and follow-up of more than 10 mmol/mol (nearly 1%). There were no overall changes for the waitlist control group.

Conclusion: This initial report suggests that learning to be kinder to oneself (rather than harshly self-critical) may have both psychological and metabolic benefits among diabetes patients.
7.3 Introduction

Major depression is estimated to affect at least 12% of diabetes patients (Roy & Lloyd, 2012) with sub-clinical mood symptoms and distress apparent in nearly one third (31%) of people living with this chronic condition (Anderson, Freedland, Clouse, & Lustman, 2001). In addition to predicting a higher negative affect, the emotional burden of distress about managing one’s diabetes may be a qualitatively different experience to depression per se (Snoek, Bremmer, & Hermanns, 2015; Gregg, Callaghan, & Hayes, & Glenn-Lawson, 2007). Though both are linked to poorer glycaemic control, evidence suggest distress rather than depression may be a better predictor of metabolic outcomes (Snoek et al.; Friis, Johnson, Cutfield & Consedine, 2015). Of note, given the scale and impact of mood disturbance among diabetes patients evidence for psychological interventions that successfully treat depression and distress and, ideally, concurrently improve metabolic outcomes is limited.

Several reasons exist to continue the search for psychotherapeutic interventions designed to improve mental and physical health outcomes among diabetes patients. A meta-analysis of randomized controlled trials (RCTs) for treating depression in diabetes showed that psychotherapeutic treatments are moderately effective for depression and that cognitive behavior therapy (CBT) in particular had a small effect on glycemic control (van der Feltz-Cornelis, et al., 2010). Although the number and sample sizes of studies included in this meta-analysis was relatively small (10 of the 14 included studies investigated samples ranging from 13 to 60 participants), a more recent study of 87 depressed adults with uncontrolled Type 2 diabetes found CBT focussed on adherence and depression improved these outcomes as well as glycaemic control (Safren, et al., 2014). On the other hand, in their RCT, Hermanns et al., (2015) found that diabetes-specific CBT reduced depression and distress in a mixed sample (n = 214) of patients with type 1 and 2 diabetes but had no between-group effect on
HbA1c, and a large-scale meta-analysis and review showed no effects of psychological interventions on glycemic control among adults with type 1 diabetes (Winkley, Ismail, Landau & Eisler, 2006).

Overall, the wide variation in methodologies and inclusion criteria, including the fact that most trials also included other supportive treatments such as diabetes education alongside the intervention, means that drawing conclusions about the efficacy of current psychological treatment approaches and/or their metabolic effects remains difficult.

Given the prevalence and health-related implications of mood difficulties among people living with diabetes, and the lack of conclusive evidence for current psychological interventions or their effects on glycemic indices, the search for behavioral interventions that can meet patient needs on a broad scale must continue.

One promising approach to improving well-being in clinical settings is the practice of ‘self-compassion’, an ancient idea arising alongside research into the health benefits associated with mindfulness. Recent studies of mindfulness interventions among diabetes patients have shown consistent improvements in psychological outcomes including depression, but effects on metabolic control have been varied (Noordali, Cumming, & Thompson, 2015). Fundamentally, self-compassion based treatments are based on the notion that significant portions of psychological distress are created by the tendency to be self-critical regarding actual or perceive failures. Self-compassion incorporates mindfulness as a core component (Neff, 2003) but does so while also attempting to encourage a sense of common humanity (recognising that everyone goes through difficult times) and self-kindness (responding to one’s suffering with gentleness and understanding instead of judgment and criticism). Unlike mindfulness, self-compassion directly trains the capacity for active soothing and self-
comforting in times of suffering. Persons are trained to treat themselves in the same way they might treat distress in a beloved “other”, providing gentle comfort and tending to their own needs for self-care.

For a patient population in which the relentless demand for healthy blood glucose control present daily opportunities for failure and thus ‘attacks’ on the self, the practi ce of self-kindness may reduce psychological suffering, with subsequent, flow-on metabolic benefits. Evidence in both healthy and patient populations (Terry, Leary, Mehta, & Henderson, 2013) has linked greater self-kindness with better mood and a recent meta-analysis of nearly 80 studies showed a large effect size ($r = .47$) in the relationship between self-compassion and well-being (Zessin, Dickhauser, & Garbade, 2015). While evidence from diabetes is scanty, one study has found that self-compassion predicted less diabetes-specific distress and buffered the link between diabetes distress and poorer metabolic outcomes (Friis, et al., 2015).

Drawing from studies that show self-compassion can be increased through training (Neff & Germer, 2013), the current report tested whether an 8-week group-based self-compassion intervention would improve psychological and physical health outcomes among diabetes patients. We expected that self-compassion would increase over the training period and that the training would reduce both depression and diabetes-specific distress in the intervention arm; it was expected that these gains would be sustained at 3 month follow up. It was also expected that self-compassion training would reduce $\text{HbA1c}$ levels across the same time period.

7.4 Research design and methods

This was a randomized controlled trial contrasting a standardized mindful self-compassion (MSC) intervention with a wait-list (treatment as usual) control. Participants were 63 patients with either Type 1 or Type 2 diabetes. They were aged
between 18 and 70 years ($M=42.87$, $SD=14.30$), fluent in English, and able to attend a minimum of six out of the eight scheduled treatment sessions. Exclusion criteria were self-reported inability to read and write English. Participants were recruited between July 2014 and September 2014 at three hospital sites in Auckland, New Zealand. Recruitment was through self-referral to the trial or following recommendations from a patient’s physician or diabetes nurse; the study was widely advertised through numerous local diabetes centres. All participants provided written informed consent.

7.4.1 Procedure

Participants in the intervention condition ($n=32$) were assessed at baseline ($T_1$), at Week 8 ($T_2$), and 3 months after training had concluded ($T_3$). Participants in the wait-list control ($n=31$) condition completed identical measurements at the same three time points. All participants received $20 vouchers each time they provided data to cover the costs associated with travelling to laboratories for blood testing. Intervention group participants received an additional $20 voucher for each session they attended to cover transport and parking costs. Treatment groups began in August 2014 and were complete by October 2014.

7.4.2 Treatment allocation

Randomization was carried out by a trained researcher blind to hypotheses or design and without participant contact, using randomization software. Patients were told they would be participating in a programme based on evidence that learning to treat oneself with kindness and understanding when faced with difficult feelings and circumstances could be good for mental and physical health. They were told that they might be allocated to either a skills training workshop or a wait-list control. No further information about the MSC programme was provided.
7.4.3 Intervention

MSC is a protocol-standardized intervention aimed at increasing mindfulness and self-compassion and reducing the suffering associated with experiential avoidance (Neff & Germer, 2013). Sessions were delivered to groups of between 8 and 12 people during eight, weekly sessions, each lasting two and a-half hours. Adherence to the standard MSC protocol was strict, without specific reference to diabetes as a particular source of suffering. The intervention was delivered by the first author, a New Zealand registered health psychologist, trained to teach the programme according to manualized MSC protocols. Clinical supervision was conducted weekly via skype conference with MSC trainers across the intervention period. All participants received a standardized email two days after each weekly session summarizing the week’s teachings and encouraging them to practise what they had learned during the previous session.

The central components of MSC are formal meditation, together with formal and informal self-compassion practises aimed at developing the cognitive, behavioral, and physical capacities to soothe and comfort oneself when distressed (see Appendix 1 Session Plan).

7.4.3.1 Wait-list condition

Participants in the wait-list condition received medical treatment as usual.

7.4.3.2 Assessments

Age, sex, ethnicity, and health status were assessed via self-report, as were time since diagnosis and type of diabetes.

7.4.4 Outcome measures

Self-compassion was assessed using the Self-Compassion Scale (SCS) (Neff, 2015), a 26-item, 5 point Likert scale questionnaire comprising positive subscales of self-kindness, common humanity and mindfulness, and negative subscales of self-judgment, isolation and over-identification. Studies have demonstrated satisfactory psychometric
properties (Neff, 2015). Factor analysis has confirmed the six-factor structure of the scale and the single higher-order component of self-compassion. Reliabilities for the aggregate total score in the current study were $T_1 = 0.91, T_2 = 0.91, T_3 = 0.93$.

### 7.4.4.1 Depression

Depression was assessed using the PHQ-9 (van Steenbergen-Weijenburg, et al., 2010) which assesses the symptoms of major depressive disorder. Using a two-week time window, responders use a scale from 1 ‘not at all’ to 4 ‘almost every day’ to rate symptoms. A summed score is calculated. The PHQ-9 is widely used, with excellent psychometric properties, and validated with diabetes patients in both primary and specialized outpatient clinics (Fisher, Skaff, Mullan, Arean, Glasgow, & Masharani, 2008). Alpha reliabilities for the current study were $T_1 = 0.81, T_2 = 0.87, T_3 = 0.85$.

*Diabetes-Specific Distress* is common among diabetes patients and is consistently linked to poor bio-behavioral disease management (Polonsky, et al., 2005). The Diabetes Distress Scale -17 (DDS-17) has 17 items with a consistent factor structure, good internal reliability, and validity (Polonsky et al.). The DDS contains items from four established domains of diabetes-related distress: emotional burden, physician-related distress, regimen-related distress, and interpersonal-related distress. A total score is calculated, with a mean item score of 3 or higher considered to be “high distress” and worthy of clinical attention; higher scores on the DDS-17 have been associated with greater HbA1c (Polonsky, et al.). Alpha reliabilities for the total scale were $T_1 = 0.87, T_2 = 0.90, T_3 = 0.92$.

*Glycemic control* indicated by HbA1c values at the three time points was assessed using values reported via Labtests Auckland Limited, an accredited medical testing laboratory, using the Roche Integra platform. HbA1c reflects mean blood glucose levels
over the previous 2-3 months and is the standard assessment of glycemia (Derr, Garrett, Stacy, & Saudek, 2003).

### 7.4.5 Sample size calculation

The sample size calculation, based on use of mixed model 2 (group) x 3 (time) repeated measures ANOVA, was estimated from a review and meta analysis of psychological interventions among diabetes patients (van der Feltz-Cornelis, 2010), in which effects of treatment on glycemic control were substantially smaller than the moderate effects found for depression. A priori analyses using Gpower 3.1 software with an $f$ effect size of 0.25 alpha probability of .05, suggested a minimum sample of 44 participants. Allowing for drop out and retention (van Son, et al., 2013; Tovote, et al., 2014), 63 participants were recruited.

### 7.4.6 Statistical analyses

The Consolidated Standards of Reporting Trials (CONSORT) guidelines for randomized trials were followed and intention-to-treat (ITT) analyses were conducted using SPSS Statistics 20 (SPSS Inc.). Individual missing values were imputed using the means of the relevant sub-scale (for the SCS and DDS), or the total scale mean for the PHQ-9. For missing HbA1c values ($n = 6/189$), the most recently recorded value was carried forward. For the 4 participants who withdrew from the study, measurements from the time point prior to withdrawal were carried forward for analysis and all multivariate assumptions were met. As a further check, per-protocol analyses were conducted revealing a very similar pattern of results for both biological and subjective outcomes. Independent samples $t$ tests and $\chi^2$ analyses were used to test for possible group differences in demographic and clinical variables at baseline ($T_1$).

A series of 2 (group) x 3 (time) mixed model ANOVAs tested the expectations that (a) randomization to the self-compassion training would increase self-compassion
as well as reduce depression, distress and HbA1c, relative to the wait list control and (b) that these gains would be maintained at 3 month follow-up. Effect sizes are reported as partial eta squared coefficients. To further interpret any time x group interactions, a series of t-tests examined possible differences between T1 (baseline) and T2 (post-intervention), between T2 and T3 (3 month follow-up), as well as between T1 and T3.

7.4.7 Clinically meaningful improvement

Clinically meaningful improvements in outcomes were defined as reductions between T1 and T3 of (1) at least 5 points on the baseline PHQ-9 score (Lowe, Unutzer, Callahan, Perkins, & Kroenke, 2004); (2) at least 1 point on the DDS mean (Fisher et al., 2013) and (3) at least 0.5% (5.5 mmol/mol) in HbA1c scores (Lenters-Westra, Schindhelm, Bilo, & Groenier, 2014). Chi square analyses were used to test between-group differences in the proportion of participants showing clinically significant improvement.

7.5 Results

7.5.1 Recruitment and attrition

As indicated in the Consort diagram below (see Fig 7.1), 84 people indicated an initial interest in participation. Of these, 71 were randomized (15% non eligible), and 63 ultimately provided data for the study, 32 in the intervention condition and 31 in the control condition (89% of eligible). Chi-square analysis showed no group differences in attrition (of the 63 participants who provided baseline data, 4 withdrew, 2 from each condition).
Figure 7.1. Consort diagram
7.5.2 Baseline characteristics

Table 7.1 provides an overview of the study sample stratified by group. There were no differences between the two groups at baseline in demographic or diabetes-specific characteristics other than time since diagnosis. There were, however, between-group differences at baseline on psychological and clinical metrics; PHQ-9, DDS and HbA1c scores were greater, and SCS scores lower, in the intervention group compared to the control group. A greater proportion of intervention participants were categorized as having clinically significant diabetes distress but there were no differences in the proportion with clinically significant depression (see Table 7.2). Because of these baseline differences, primary analyses were replicated using an ANCOVA, in which baseline values were covaried and T2 and T3 values entered as repeated measures. Results were essentially unchanged.
Table 7.1
Baseline characteristics of the sample

<table>
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<th>Demographic</th>
<th>MSC (n = 32)</th>
<th>Waitlist (n = 31)</th>
<th>Total (n = 63)</th>
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</thead>
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<td>Age in years, M (SD)</td>
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<td>46.65 (16.44)</td>
<td>44.37 (15.62)</td>
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<td>Sex, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12 (37.50%)</td>
<td>8 (25.81%)</td>
<td>20 (31.75%)</td>
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<tr>
<td>Female</td>
<td>20 (62.50%)</td>
<td>23 (74.19%)</td>
<td>43 (68.25%)</td>
</tr>
<tr>
<td>Ethnicity n (%)</td>
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<td></td>
<td></td>
</tr>
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<td>26 (83.88%)</td>
<td>46 (73.02%)</td>
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<td>1 (1.59%)</td>
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<td>5 (7.94%)</td>
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<td>3 (4.76%)</td>
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<td>Other European</td>
<td>7 (21.88%)</td>
<td>1 (3.22%)</td>
<td>8 (12.70%)</td>
</tr>
<tr>
<td>Type of diabetes, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 1</td>
<td>26 (81.25%)</td>
<td>20 (64.51%)</td>
<td>46 (73%)</td>
</tr>
<tr>
<td>Type 2</td>
<td>3 (9.37%)</td>
<td>6 (19.35%)</td>
<td>9 (14.3%)</td>
</tr>
<tr>
<td>Type 2 on insulin</td>
<td>3 (9.37%)</td>
<td>5 (16.13%)</td>
<td>8 (12.7%)</td>
</tr>
<tr>
<td>Time since diagnosis in years, M(SD) *</td>
<td>19.90 (13.58)</td>
<td>13.46 (9.94)</td>
<td>16.84 (12.32)</td>
</tr>
</tbody>
</table>

Significant differences between groups indicated by *p < .05
Table 7.2
Means and standard deviations for primary outcomes - self-compassion (SCS), depression (PHQ-9), diabetes distress (DDS) and HbA1c at Baseline (T1), Week 8 (T2) and 3 month follow-up (T3).

<table>
<thead>
<tr>
<th>Measure (Range)</th>
<th>Group</th>
<th>T1 M (SD)</th>
<th>T2 M (SD)</th>
<th>T3 M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS* (0-5)</td>
<td>MSC</td>
<td>2.52 (0.57)</td>
<td>3.10 (0.50)</td>
<td>3.21 (0.72)</td>
</tr>
<tr>
<td></td>
<td>Wait</td>
<td>2.88 (0.60)</td>
<td>3.12 (0.64)</td>
<td>3.08 (0.59)</td>
</tr>
<tr>
<td>PHQ9* (0-27)</td>
<td>MSC</td>
<td>14.01 (4.52)</td>
<td>9.16 (6.50)</td>
<td>7.88 (4.62)</td>
</tr>
<tr>
<td></td>
<td>Wait</td>
<td>9.74 (6.06)</td>
<td>7.30 (5.02)</td>
<td>9.32 (6.50)</td>
</tr>
<tr>
<td>DDS** (0-6)</td>
<td>MSC</td>
<td>3.16 (0.88)</td>
<td>2.33 (0.86)</td>
<td>2.10 (0.84)</td>
</tr>
<tr>
<td></td>
<td>Wait</td>
<td>2.35 (0.63)</td>
<td>2.29 (0.85)</td>
<td>2.10 (0.89)</td>
</tr>
<tr>
<td>Clinical HbA1c*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mmol/mol</td>
<td>MSC</td>
<td>74.25 (15.11)</td>
<td>71.44 (18.34)</td>
<td>64.03 (16.25)</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>8.94 (1.38)</td>
<td>8.69 (1.68)</td>
<td>8.0 (1.49)</td>
</tr>
<tr>
<td>mmol/mol</td>
<td>Wait</td>
<td>64.06 (13.32)</td>
<td>66.03 (14.20)</td>
<td>62.32 (12.41)</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td>8.01 (1.22)</td>
<td>8.19 (1.14)</td>
<td>7.85 (1.36)</td>
</tr>
<tr>
<td>Depressed</td>
<td>n (% of total)</td>
<td>n (% of total)</td>
<td>n (% of total)</td>
<td></td>
</tr>
<tr>
<td>PHQ &gt;12</td>
<td>MSC</td>
<td>20 (62.5%)</td>
<td>11 (34.4%)</td>
<td>6 (18.8%)</td>
</tr>
<tr>
<td></td>
<td>Wait</td>
<td>13 (41.93%)</td>
<td>7 (22.6%)</td>
<td>7 (22.6%)</td>
</tr>
<tr>
<td>Distressed**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DDS ≥3</td>
<td>MSC</td>
<td>16 (50.00%)</td>
<td>8 (25.0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td></td>
<td>Wait</td>
<td>3 (9.70%)</td>
<td>6 (19.4%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Significant differences between groups at baseline indicated by *p < .05 or **p < .001
7.5.3 Changes in self-compassion

The ANOVA showed a main effect of time, $F(2,60) = 13.07, p < .001, h_{p}^{2} = .30$, but not group, $F(1,61) = 0.02, p > .05$. There was, however, also an interaction between time and group, $F(2,60) = 0.06, p = .001, h_{p}^{2} = .21$. Plot inspection, confirmed with $t$-tests (see Table 7.3), showed that self-compassion increased in the intervention group between T1 and T2, with gains maintained at three month follow up (T3). There were no changes in the control group at any time (see Figure 7.2).

7.5.4 Changes in depressive symptoms

The ANOVA testing for changes in depressive symptoms showed an effect for time, $F(2,60) = 12.40, p < .001, h_{p}^{2} = .29$. As with the SCS scores, there was no main effect for group $F(1,61) = 2.40, p > .05$, but there was a significant time by group interaction, $F(2,60) = 7.07, p < .05, h_{p}^{2} = .19$. Plot inspection confirmed by $t$-tests (see Table 7.3) showed that the intervention reduced depression scores in the experimental group between T1 and T2, with results maintained at follow-up (T3). There were no changes in depression scores in the control group between any time point (see Figure 7.2).

7.5.5 Changes in diabetes distress

The ANOVA showed effects for both time, $F(2,60) = 27.30, p < .001, h_{p}^{2} = .48$, and group, $F(1,61) = 3.92, p = .05, h_{p}^{2} = .06$, as well as an interaction between time and group, $F(2,60) = 12.24, p < .001, h_{p}^{2} = .29$. Plot inspection, confirmed with $t$-tests (see Table 7.3) showed that the intervention reduced distress in the MSC group between T1 and T2 with improvements maintained at three month follow up (T3). While there were no changes evident in the control group between T1 and T2, there was an overall reduction in distress scores between T1 and T3 in this group (see Figure 7.2).
7.5.6 Changes in HbA$_1$C

Results showed an effect for time, $F(2,60) = 13.25$, $p < .001$, $h_p^2 = .31$, but not group $F(1,61) = 2.66$, $p > .05$. The general reduction in HbA$_1$C over time was, however, again qualified by an interaction between time and group $F(2,60) = 5.1$, $p < .05$, $h_p^2 = .15$.

Inspection of the interaction plot, confirmed by $t$-tests (see Table 7.3), showed that while HbA$_1$C did not change between baseline (T$_1$) and T$_2$ in the intervention group, scores reduced by more than 10 mmol/mol (nearly 1%) between T$_1$ and three month follow up (T$_3$). There was no change overall between T$_1$ and T$_3$ for the control group (see Figure 7.2).
Table 7.3
Results of t-tests between baseline (pre-intervention $T_1$) and end of eight-week MSC training (post-intervention $T_2$); $T_2$ to three month follow-up ($T_3$), and overall differences between $T_1$ and $T_3$ for MSC and Control groups separately.

<table>
<thead>
<tr>
<th>Measure</th>
<th>$T_1$-$T_2$</th>
<th>Mean Diff(SE)</th>
<th>$T_2$-$T_3$</th>
<th>Mean Diff(SE)</th>
<th>$T_1$-$T_3$</th>
<th>Mean Diff(SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS</td>
<td>MSC</td>
<td>$t$(31) = 4.70**</td>
<td>0.58(0.12)</td>
<td>$t$(31) = 0.88</td>
<td>0.11(0.14)</td>
<td>$t$(31) = 5.10**</td>
</tr>
<tr>
<td></td>
<td>Wait</td>
<td>$t$(30) = 1.93</td>
<td>0.58(0.13)</td>
<td>$t$(30) = -1.92</td>
<td>-0.24(0.12)</td>
<td>$t$(30) = 0.14</td>
</tr>
<tr>
<td>PHQ9</td>
<td>MSC</td>
<td>$t$(31) = -3.85*</td>
<td>-4.86(1.27)</td>
<td>$t$(31) = -0.95</td>
<td>1.3(1.35)</td>
<td>$t$(31) = -5.92**</td>
</tr>
<tr>
<td></td>
<td>Wait</td>
<td>$t$(30) = -1.96</td>
<td>-2.44(1.25)</td>
<td>$t$(30) = 1.74</td>
<td>2.03(1.17)</td>
<td>$t$(30) = -0.38</td>
</tr>
<tr>
<td>DDS</td>
<td>MSC</td>
<td>$t$(31) = 4.56**</td>
<td>0.83(0.18)</td>
<td>$t$(31) = -1.12</td>
<td>-0.23(1.18)</td>
<td>$t$(31) = -7.23**</td>
</tr>
<tr>
<td></td>
<td>Wait</td>
<td>$t$(30) = -0.36</td>
<td>-0.06(0.17)</td>
<td>$t$(30) = -0.90</td>
<td>-0.19(0.21)</td>
<td>$t$(30) = -2.11*</td>
</tr>
<tr>
<td>HbA1c</td>
<td>MSC mmol/mol</td>
<td>$t$(31) = -1.47</td>
<td>2.81(1.91)</td>
<td>$t$(31) = -3.63*</td>
<td>-7.41(2.04)</td>
<td>$t$(31) = -4.65**</td>
</tr>
<tr>
<td></td>
<td>MSC %</td>
<td>$t$(31) = -1.47</td>
<td>-0.26(0.18)</td>
<td>$t$(31) = -3.63*</td>
<td>-0.68(0.19)</td>
<td>$t$(31) = -4.65**</td>
</tr>
<tr>
<td></td>
<td>Wait mmol/mol</td>
<td>$t$(30) = 1.58</td>
<td>1.20(1.25)</td>
<td>$t$(30) = -3.27*</td>
<td>-3.71(1.14)</td>
<td>$t$(30) = -1.20</td>
</tr>
<tr>
<td></td>
<td>Wait %</td>
<td>$t$(30) = 1.58</td>
<td>0.18(0.11)</td>
<td>$t$(30) = -3.27*</td>
<td>-0.34(0.10)</td>
<td>$t$(30) = -1.20</td>
</tr>
</tbody>
</table>

* $p < .05$, ** $p < .001$
Figure 7.2. Mean difference scores in outcome measures for each group for each intervention phase (T1 to T2, T2 to T3, and T1 to T3).
7.5.7 Clinically significant change

Finally, analyses demonstrated group differences in the proportion of participants showing clinically meaningful improvement between baseline (T1) and 3 month follow-up (T3). In the MSC group, 20 participants (62.5%) recorded a clinically meaningful decrease in PHQ-9 depression scores compared to 5 participants (16.1%) in the control group, $\chi^2 (1, n = 63) = 12.28, p < .001$, $\phi = -.47$. Equally, 15 participants (46.9%) in the MSC group recorded clinically meaningful reductions in distress compared to 3 participants (9.7%) in the control group, $\chi^2 (1, n = 63) = 8.93, p < .05$, $\phi = -.41$. For HbA1c, 21 participants (65.6%) in the MSC group recorded a clinically meaningful decrease, compared to 9 participants (29%) in the control group, $\chi^2 (1, n = 63) = 7.05, p < .05$, $\phi = -.37$.

7.6 Discussion

To our knowledge, this report represents the first investigation into the possible utility of self-compassion training in improving mood and metabolic outcomes among Type 1 and Type 2 diabetes patients. As expected, the 8-week MSC intervention increased self-compassion, a finding that is consistent with a prior RCT of the MSC protocol and other evidence suggesting self-compassion can be learned (Neff & Germer, 2013). The current study extends these findings to a diabetes population, a difficult-to-treat patient group among whom harsh self-criticism is not only common (Basco, 1998), but also a likely correlate of mood and behavioral self-management difficulties. As such, finding that the intervention showed the expected benefits in terms of reducing depression and diabetes-specific distress is important. Perhaps most notably – and consistent with our final hypothesis – self-compassion training also reduced HbA1c, suggesting the MSC intervention impacted both subjective and objective metrics, an
extension upon most prior psychosocial RCTs among diabetes patients (Harkness, Macdonald, Valderas, Coventry, Gask, & Bower, 2010).

Given the absence of compassion-specific studies among diabetes patients, this discussion considers these findings in relation to prior studies incorporating aspects of mindfulness or acceptance, a class of psychosocial intervention that may also engender compassion alongside acceptance of difficult thoughts and feelings (Gregg, et al., 2007; Pauley & McPherson, 2010). We consider possible explanations for the benefits of self-compassion, evaluate the clinical possibilities for compassion-based therapies in diabetes, and offer directions for future research and clinical practice.

Firstly, the finding that the MSC programme reduced depression adds to the overall evidence for psychosocial interventions among people with diabetes (van der Feltz-Cornelis, et al., 2010; Safren et al., 2014., Hermanns, et al., 2015; Winkley, et al., 2006) as well as being consistent with several mindfulness-based randomized controlled (Gregg, et al., 2007, van Son, et al., 2013; Tovote, et al., 2014), and uncontrolled (Young, Cappola, & Baime, 2009; Rosenzweig, et al., 2007) studies. However, while mindfulness is a foundation of MSC, self-compassion is broader in scope than mindfulness alone, concurrently emphasizing self-kindness (rather than self-criticism) and common humanity (compared to isolation), qualities also associated with wellbeing (Zessin, et al., 2015). A recent pilot study among breast cancer survivors (another group in which mood disorders are common) of an 8-week cognitively-based compassion intervention also reported reduced depression after sessions emphasizing self-kindness and common humanity (Dodds, et al., 2015), providing preliminary evidence for the efficacy of this type of training.

Second, that the training reduced diabetes distress is likewise consistent with prior mindfulness interventions (Gregg, et al., 2007; van Son, et al., 2013; Tovote, et al.,
Although diabetes-related topics were not explicitly referred to during the MSC programme, participants were recruited as diabetes patients. As such, the emphasis on mindful acceptance of difficulty as being normal ("other people in my situation feel like this") and active soothing of stressed or uncomfortable emotional states ("may I be kind to myself in this moment") likely elicited diabetes-related thoughts, with the MSC practises then proving helpful in reducing the associated distress. This interpretation is consistent with the findings of Gregg et al., (2007) in which mindfulness and acceptance training reduced difficult diabetes-related thoughts and feelings. In contrast, a problem-solving approach (i.e., attempting to solve the problems eliciting distress) largely failed to find between-group differences in distress (Fisher, et al., 2013).

Thirdly, our finding that the MSC training resulted in reduced HbA$_{1c}$ is among a very small number of psychosocial RCTs to record this critical result (Gregg, et al., 2007; Hermanns, et al., 2015; Winkley, et al., 2006). Although the interaction between mental health and metabolic outcomes among diabetes patients is complex (Winkley, et al.,) and the impact of depression reduction to improve glycemic control still controversial (Lustman & Clouse, 2005), these results are consistent with preliminary evidence from recent studies suggesting psychological factors may buffer biological systems from the negative effects of diabetes distress (Friis, et al., 2015).

One possible explanation for this pattern of benefit is found in data regarding the physiological and autonomic processes thought to underlie self-compassion. It may be that actively soothing oneself when distressed reduces stress responses that are linked to blood glucose levels (Surwit, et al., 2002). Evidence suggests that brief self-compassion exercises reduce cortisol (Rockliff, Gilbert, McEwan, Lightman, & Glover, 2008) and a greater ability to self-soothe has been linked to greater heart-rate
variability (Porges, 2007), a measure of autonomic flexibility. Further still, cross-sectional data show that self-compassion is associated with lower IL-6 (Breines, Thoma, Gianferante, Hanlin, Chen, & Rohleder, 2014), perhaps implying a link with inflammatory processes that are, in turn, also linked to both stress (Slavich & Irwin, 2014) and HbA1c (Kristiansen & Mandrup-Poulsen, 2005).

Hence, while the current data are clearly preliminary and do not directly illuminate the mechanisms at play, they are consistent with the notion that self-compassion deactivates threat systems (associated with the release of cortisol and adrenalin) and activates the mammalian self-soothing system associated with the release of oxytocin and opiates (Gilbert & Irons, 2005). Thus, learning to be kinder to oneself when stress or suffering arises – i.e., active self-soothing in the face of stress and difficult emotions – may be linked to particular physiological processes which are, in themselves, linked to HbA1c.

7.7 Limitations and strengths of the study

These contributions noted, the data are limited in some important regards. Firstly, findings are generalizable only to those who volunteered for the RCT. Although attrition was low for a longitudinal study of this kind (van Son, et al., 2013; Tovote, et al., 2014) no formal analyses of selectivity were possible and larger, more representative trials are warranted.

Secondly, while participants were not recruited on the basis of mood problems, more than half of the participants in our study (52.38%) reported clinically significant depression and near a third (30.16%) reported clinically relevant distress at baseline, rates notably higher than those reported among diabetes patients in general (van Son et al., 2013). Consequently, it is possible that more distressed persons differentially volunteered for the trial and/or that benefits are more pronounced among persons...
with greater levels of distress and depression (and poorer glycemic control). In addition, we also note a failure of randomization with between-group baseline differences in key in clinical markers of depression, distress and HbA$_{1c}$, as well as in self-compassion. While the analytic approach should accommodate such differences, findings must nonetheless be interpreted with caution as findings may be limited to those with more ‘room to improve” in terms of greater baseline levels of depression and distress, among whom higher HbA$_{1c}$ can be expected (Anderson, et al., 2001).

Finally, the absence of an active control group means non-specific factors including group support, or simply meeting with a teacher and fellow diabetes patients in a supportive way over a period of eight weeks, may be responsible for the observed effects. Caution must therefore be applied in attributing these results to the effects of the MSC intervention specifically, and findings must again be considered preliminary. Notwithstanding these limitations, this is - to our knowledge - one of the first RCT of a stand-alone psychological intervention (i.e., without the inclusion of diabetes-specific education or material) to have found differences in both psychological and physiological metrics (HbA$_{1c}$), in what is typically a hard-to-treat population.

Offsetting these limitations, however, are a low drop out rate (6.30%) which is unusual for distressed diabetes patients where levels of around 30% drop-out are common (van Son, et al., 2013; Tovote, et al., 2014; van Bastelaar, Pouwer, Cuijpers, Riper, & Snoek, 2011). Participants were clearly motivated to attend the MSC sessions and to stay involved in the programme until completion. Waitlist participants were also motivated to attend sessions, with nearly two thirds of the control group subsequently taking part in the MSC programme immediately following the conclusion of the experimental protocol.
7.8 Future directions

Living with diabetes involves relentless self-care responsibilities that are understandably overwhelming for patients at times. Opportunities for negative self-evaluation and self-criticism of failures in diabetes self-management abound. While there is some evidence for the effectiveness of mindfulness-based interventions in this patient group, it may be that developing the capacity to actively soothe and comfort oneself during suffering – i.e., self-compassion - is also useful in mitigating the harmful effects of self-criticism. Such benefits might conceivably extend to other chronically ill populations in which issues with self-regulation and mood are common. Randomized trials with large sample sizes, active controls, and longer-term follow-up of both psychological and metabolic outcomes will be needed, using easily replicable protocols.

7.9 Conclusions

In summary, these data show that a standardized, 8-week self-compassion intervention is able to improve both mental health and metabolic outcomes in patients with diabetes. The increased capacity to be kind and understanding to oneself in the face of difficult feelings may therefore be an important focus for training as part of reducing the suffering linked to depression and distress, and well as improving the key clinical marker of effective diabetic management, HbA1c.

7.10 Acknowledgements

A.F wrote the manuscript, researched data and is the guarantor, taking full responsibility for the work as a whole. M.J. and N.C. assisted with data analysis and reviewed/edited the manuscript. R.C provided clinical supervision. This study was made possible with the support of the New Zealand Society for the Study of Diabetes, and the New Zealand Diabetes Foundation. There are no conflicts of interest.
Chapter 8. General Discussion and Clinical Implications

8.1 Overview

“An affectionate disposition not only makes the mind more peaceful and calm, but it affects our body in a positive way too.”

14th Dalai Lama (Tenzin Gyatso)

The notion that kindness might be good for one’s health is familiar to students of Eastern philosophy. However, it is only in the last decade or so that its potential clinical and therapeutic value has been the focus of Western empirical study (for example, see Galante, Galante, Bekkers, & Gallacher, 2014). While most compassion-based studies thus far have been conducted among healthy populations, the primary contribution of this thesis is to provide an initial demonstration of the potential utility of self-compassion, or kindness towards oneself, for improving health outcomes in a patient population. The biopsychosocial challenges of living with diabetes - a condition with daily opportunities to criticize one’s condition, test results, or self-management performance - provide fertile ground for experimentation with the health benefits of a kindly self-attitude. However, while seemingly crying out for kindness-based approaches to treating mental health problems common in this population, the theoretical and empirical works presented in this thesis represent the first of their kind.

Given the ‘blank canvas’ offered by the absence of any prior self-compassion work in diabetes, this thesis began by proposing an initial theoretical model in which self-compassion (a possible antidote to the effects of self-criticism) might predict better health outcomes in this patient group. Further work then empirically investigated these proposed links with cross-sectional (Chapter 5) and experimental (Chapter 6) studies. While the cross-sectional study demonstrated the expected links between self-
compassion and better health outcomes, the experimental data were not unambiguously consistent with the notion of self-compassion being beneficial, at least with a brief induction in a laboratory setting. Extending these initial findings, a randomized controlled trial then investigated the health effects of a more substantial self-compassion intervention with patients suffering from diabetes (Chapter 7). Encouragingly, the results of the RCT showed that self-compassion can be trained over time among diabetes patients, resulting in quantifiable and important health benefits relative to a passive control.

In this final chapter, the key findings and contributions from these studies are revisited and results integrated within the broader literature that has emerged since this thesis was first conceived. Interpretatively, it is suggested that self-compassion may facilitate better health outcomes because it offers or enables more adaptive emotion regulation. Specifically for people living with diabetes, self-compassion may enable flexible emotional and physiological responses to the stress and distress frequently accompanying living with this difficult-to-manage condition. The chapter concludes with a discussion of the clinical implications of this body of work, as well as its limitations and opportunities for future empirical investigation.

8.2 Summary of key findings

Before revisiting the results in the context of the broader literature, the following section provides the reader with a brief 'recap' of the overall trajectory of this thesis, noting its roots in the debilitating sadness and distress evident in large numbers of diabetes patients.

In describing the status quo in terms of treatment, Chapter 4 provided data consistent with the notion that mood problems among patients are both common and predictive of negative physical outcomes (Van der Felt-Cornelis, Nuyen, Stoop, & Chan,
equally, the review showed the currently available psychosocial interventions to be of mixed success in treating these mood difficulties, with no evidence for interventions that concurrently improve both mental and physical health (Harkness, Macdonald, Valderas, Coventry, Gask, & Bower, 2010). In light of this, the major contribution of Chapter 4 was to provide a rationale for employing self-compassion as an alternative treatment model. The core notion in this approach is that the development of a self-compassionate attitude might be protective against the unhelpful psychological, physiological and behavioural processes linked to depressed affect and poor self-regulation.

A logical next step was to examine these hypothesized relationships in the real world; a cross-sectional study among diabetes patients (n = 110) showed that dispositional self-compassion predicted less depression and distress and attenuated the association between greater distress and poorer metabolic outcomes (see Chapter 5). As a cross-sectional study, however, causal pathways for these relationships remain unclear. This consideration, coupled with the possibility of third variable explanations, argued for experimental work to explore the relationships.

To provide an early test of the possibility that self-compassion may lead to better health outcomes via increased self-care, a laboratory experiment among healthy volunteers (n = 42) was conducted; teeth flossing was selected as a common health behaviour in which “failures” were plausible (see Chapter 6). Findings were both complex and counter-intuitive: relative to self-criticism, the self-compassion manipulation did result in greater positive affect, but only temporarily, and effects on mood were no longer apparent after participants received critical feedback on an initial flossing attempt. Furthermore, it was the participants randomized to the self-critical condition who demonstrated greater motivation to floss.
The final study (Chapter 7) in this research programme was a RCT among diabetes patients \((n = 63)\) testing whether a more substantial and standardized self-compassion intervention (Mindful Self-Compassion) would improve depressed mood and metabolic health \((\text{HbA}_1\text{c})\) in a sustainable manner. The findings of this study were encouraging: greater self-compassion, less depression and distress, and lower \(\text{HbA}_1\text{c}\) were recorded in the intervention group compared to a control group. The study is one of the first psychological interventions to record clinically meaningful reductions in both psychological symptoms and metabolic outcomes in this population.

Taken together, results of the cross-sectional and experimental studies described above provide initial support for the notion that kindness does indeed matter, at least for patients with diabetes. The section below integrates the results from these studies with recent evidence from the broader literature, interpreting findings within the preliminary theoretical framework linking self-compassion, depression, and metabolic outcomes among persons with diabetes first presented in Chapter 4.

8.3 Kindness Matters: Self-compassion and improved self-regulation
In beginning to interpret the findings outlined above, two overall observations can be made. First, greater self-compassion among diabetes patients predicted better mood (in both the cross-sectional study and RCT). It also produced improved positive emotions and reduced negative emotions compared to a self-critical manipulation among healthy participants in the laboratory study, at least initially. Second, there was evidence within both patient studies that self-compassion predicted better metabolic outcomes, quantified through measurement of \(\text{HbA}_1\text{c}\), an indicator of average plasma glucose levels over an 8 to 12 week period (Chiodini, et al., 2007; Korczak, Madigan, Manassis, & Daneman, 2016). Although these improvements are, in themselves, sufficient to demonstrate the value of self-compassion, the mechanisms underlying
these associations were not directly investigated and remain unclear. However, several possibilities are evident and are considered in turn below; that self-compassion increases either (1) the motivation or (2) the ability to self-manage behaviours in ways that improve mental and physical health, and/or that (3) greater self-compassion enables patients to better regulate emotional responses, including responses to their diabetes, with commensurate benefits to physiological responding.

The first possibility is that trait self-compassion increases one's capacity to self-manage behaviour as a consequence of improved motivation to undertake self-care behaviours aligned with better health outcomes (for example, adherence to lifestyle, testing, or medication prescriptions). While results of the experimental study among healthy volunteers (Chapter 6) are, prima facie, inconsistent with this notion, data from the patient studies reported in this thesis (Chapters 5 and 7), together with other findings from the literature, suggest this interpretation may retain some merit. For example, recent cross-sectional evidence (Sirois, et al., 2015) among young adults (n = 403) showed a positive relationship between self-compassion and intentions to engage in health promoting behaviours such as eating healthily and being active. These findings were replicated in a recent study (n = 147) (Dunne, Sheffield, & Chilcott, 2016) in which self-compassion predicted more frequent health-promoting behaviours as well as lower physical symptom scores. Furthermore, mediation analyses presented in this report indicated that engagement in health-promoting behaviours partially mediated the relationship between self-compassion and physical symptoms (Dunne, et al., 2016). Such a pattern is consistent with the notion that self-compassion may increase motivation to maintain behaviours aligned to better health.

In the context of the studies reported in this thesis, it is possible, therefore, that diabetes patients who were higher in self-compassion were simply more motivated to
perform actions consistent with better metabolic control (Chapters 5 and 7), even though they may still have been distressed about their diabetes (Chapter 5). A possible interpretation for the failure of the experimental study (Chapter 6) to demonstrate results consistent with greater motivation may be that participants randomized to the self-compassion condition simply did not receive a sufficient ‘dose’ of the intervention to effect a meaningful change in this characteristic or that flossing was not seen as “self-care” by participants, thus explaining the subsequent failure of the self-compassion induction to affect behaviour in the predicted direction.

A second, related, interpretative possibility is that self-compassion may increase the ability to maintain healthy behaviours, particularly when confronted with failures or negative emotionality. Again, while this hypothesis was not supported in the laboratory study in a non-patient sample (Chapter 6), nonetheless broader evidence considered together with results from the patient studies (Chapters 5 and 7) suggests the possibility may not be without merit. A recent meta-analysis of 15 studies (including 3252 participants) showed that self-compassion predicted greater practice of positive health behaviours such as healthy eating or regular physical exercise (Sirois, Kitner, & Hirsch, et al., 2015). Furthermore, mediation analyses showed high positive and low negative affect jointly and partially mediated these effects in eight of the samples, a pattern consistent with the notion that a self-compassionate attitude promotes greater engagement in positive health behaviors as a consequence of a greater capacity to regulate emotion (Sirois, et al., 2015).

With evidence that emotional distress is a key predictor of self-regulatory failure (Wagner & Heatherton, 2015), it may be that patients higher in self-compassion (either pre-existing trait self-compassion or as an outcome of the eight-week intervention) were better able to manage difficult emotions. In turn, more effective
emotion regulation may free up psychological resources or tools such that the individual is better able to attend to behaviours aligned to better physical health outcomes. In the context of diabetes, patients higher in self-compassion may be less likely to ruminate on self-management failures or less-than-ideal test results, thus being better able to self-soothe their distress ('Other people in my situation have this occur at times, I'm not going to ruminate about this') and/or re-engage with desirable behaviours. Furthermore, if one is not “stuck” in self-criticism, isolation and rumination (the opposites of self-compassion), there may be more psychological resources available to apply to health-promoting behaviours, for example greater compliance with lifestyle and medication prescriptions.

A third explanation for the results of both the cross-sectional study (Chapter 5) and RCT (Chapter 7) is that greater self-compassion enables people with diabetes to respond more adaptively to stress, with direct physiological effects. This suggestion is consistent with data showing that greater trait self-compassion predicted more flexible autonomic responding as indexed by higher heart rate variability (Svendsen, et al., 2016). Heart rate variability (HRV) is a measure of autonomic regulatory capacity, with higher HRV thought to index a greater ability to effectively adapt to stress (Appelhans & Luecken 2006; Beevers, Ellis, & Reid, 2011; Thayer & Lane, 2000). Similarly, greater self-compassion has been linked to other biological outcomes indicating healthier physiological stress responses, for example, salivary cortisol (Rockliff, Gilbert, McEwan, & Glover, 2008), IL-6 (Pace, et al., 2009; Breines, Thoma, Gianferante, Hanlin, Chen, & Rohleder, 2014) and salivary alpha-amylase (Breines, et al., 2015), further evidence for the associations between self-compassion and physiological metrics.

Of specific relevance to diabetes populations, evidence also indicates links between HbA1c and hypothalamic-pituitary-adrenal (HPA) stress activation,
measurable as salivary cortisol (Korczak, Madigan, Manassis, & Daneman, 2016). Cortisol released in response to HPA activation increases plasma glucose, ultimately measurable as HbA1c. In light of growing evidence of a relationship between self-compassion and improved indices of physiological stress responding, it may be that self-compassion has a direct effect on HbA1c as a result of an enhanced self-regulatory capacity. For example, patients higher in self-compassion may more flexibly adapt their emotions and physiological responses to the demands of different situations, with a greater capacity to self-soothe and calm oneself in response to stress having a direct impact on HbA1c (Chiodini, et al., 2016). Furthermore, and though beyond the scope of this thesis, emerging evidence of the relationships between stress, gut microbial, and altered immunological function and their impact on diabetes might provide a further hint at biological pathways in which such processes occur (Dinan, Stilling, Stanton, & Ryan, 2015; Zhang & Zhang, 2103).

In summary, evidence presented in this thesis can be interpreted as suggesting that a self-compassionate attitude may contribute to better health outcomes via its capacity to help patients regulate both psychological and physiological responses to stress, with implications for improved emotional and physical health. In terms of the theoretical model first presented in Chapter 4 (which proposed self-compassion would predict better physical health outcomes via its capacity to protect against low mood and its deleterious flow-on effects), the results of the patient studies presented in Chapters 5 and 7 can be said to provide preliminary evidence that is consistent with these hypothesized effects.

8.4 Clinical implications and future directions

The primary motivation for this programme of study arose through bearing witness to the emotional suffering of patients with diabetes, a correlate of the diagnosis that is
often exacerbated by the patient’s self-criticism and judgement. With self-criticism a known vulnerability factor for depression (Matos, Pinto-Gouveia, & Gilbert, 2013; Gilbert & Irons, 2005; Blatt, 2004), a primary contribution of this thesis has been to provide an evidence base suggesting that self-compassion (a possible antidote to self-criticism) may protect against the mental and physical effects of low mood in this population. The central tenet of self-compassion training is the capacity to meet one’s emotional suffering - whatever the cause may be - with kindness instead of self-criticism. As such, the high levels of distress apparent among many diabetes patients represent ample opportunity for bringing the concept of self-compassion into the clinic. Because, dispositionally, more self-compassionate people appear more likely to engage in health-promoting behaviours (Sirois, 2015), self-compassion may benefit diabetes patients more broadly in terms of encouraging self-care behaviours aligned with better diabetes outcomes (Dunne, et al., 2016). With evidence for the utility of self-compassion among diabetes patients presented in this thesis, the following section discusses possibilities for its practical applications in a clinical setting, as well as suggestions for future empirical and theoretical development.

In beginning, the reader is reminded that other psychological interventions for treating low mood among diabetes patients have been of varying effect, with no overall evidence for interventions that effect both psychological and physical health outcomes (Harkness, Macdonald, Valderas, Coventry, Gask, & Bower, 2010). On the other hand, results of both the cross sectional (Chapter 5) and RCT (Chapter 7) patient studies indicate that self-compassion may have particular utility in improving both psychological and physical health outcomes in this hard-to-treat population, Therefore, finding ways to train this capacity among diabetes patients, may be an important first step. The following section considers the existing options.
Firstly, a particular benefit of the Mindful Self-Compassion (MSC) intervention used in the RCT described in Chapter 7 is that it is an empirically-based, manualised protocol that is increasingly available in the community. Therefore, it is likely to be both scalable and portable in the same way as are Mindfulness-Based Stress Reduction (MBSR) and Mindfulness Based Cognitive Therapy (MBCT) programmes. Because MSC was developed as a skills building programme for both clinical and general populations, its core principles are broadly applicable (Neff & Germer, 2013). Encouraging patients to access mindfulness and self-compassion training courses offered in the general community may be a practical first step, with subsequent benefits for mood and physical health outcomes, but also for well-being more broadly (for review of compassion training programmes see Kirby, 2016).

While evidence contained in this thesis suggests MSC has demonstrable benefits for diabetes patients, there are obvious limitations with respect to the cost and scalability of an eight-week training. Encouragingly, some of the benefits of the eight-week training on psychological outcomes may also be obtainable through shorter interventions, with evidence for several brief interventions that could be included as part of a multi-disciplinary clinical offering. For example, a three-week self-compassion intervention involving a combination of self-compassion activities and loving-kindness meditation, focusing on identifying the inner critic and finding compassionate ways to motivate the self, led to increases in resilience and well-being as well as decreases in rumination, compared to controls (Smeets & Neff, 2014). Another short-term intervention in which participants were instructed to write a self-compassionate letter to themselves once a day for seven days decreased depression for three months (Shapira & Mongrain, 2010).
Evidence for shorter-term interventions on physiological outcomes is limited. However, one self-compassion training consisting of a brief loving kindness or ‘metta’ meditation practiced every day for three days was effective in reducing anxiety and maladaptive physiological responses to a social evaluative threat, relative to control conditions (Arch, et al., 2014). Participants in the self-compassion condition listened to ten-minute meditation recordings focused on cultivating kindness and acceptance towards the self and, to a lesser extent, towards others. The self-compassion recordings were based on traditional loving kindness meditations in which participants were instructed to repeat phrases such as ‘may I be happy’, ‘may I be at ease’ to themselves with intention and self-kindness. In addition, the phrases included content based on the three components of self-compassion - self-kindness, common humanity and mindfulness - for example, ‘may I know that my joys and struggles are shared by others’ (Neff, 2003a). Results showed that even this brief training in self-compassion produced psychobiological responses to social evaluative threat consistent with lower stress (at least across a short time period), suggesting the possible utility of this readily accessible (through the internet) method of training self-compassion. While these shorter interventions remain untested among medically unwell populations and whether their effects are maintained over time is unclear, they may be practical ‘first steps’ for introducing patients to the concept and possibility of self-compassion.

The application of self-compassion in a clinical setting is a very new area of clinical research and much remains to be understood. For example, the paradoxical effects of the eight-minute self-compassion intervention (Chapter 6) in which participants were less engaged in the teeth flossing test and those in the self-critical intervention more engaged, suggests further investigation of the effects of self-compassion on both immediate and longer-term health behaviours is necessary. There
may be situations in the life of a diabetes patients in which a short, sharp dose of self-criticism (and/or the accompanying negative affect) may be of more immediate health value in terms of providing direct motivation to undertake a critical self-care than a kinder, gentler prompt. For example, if self-criticism can be seen as the equivalent of an ‘attack’ on one’s self concept, subsequent stress responses may prompt immediate action in order to reduce the threat (e.g. “my blood glucose control has been terrible today, I am going low again, how can I stop this?”). Consequently, it will be important to more fully understand implications of self-compassion on critical health care behaviours, specifically with regard to motivation.

As a further caution, people living with diabetes have suffering aplenty, not just as a consequence of their physical disease, but also in the emotional responses that frequently accompany the condition (Snoek, et al., 2015), and it is crucial that the “demand” to be kind does not, inadvertently, add to this burden. Emerging evidence suggests that for some people – particularly those who may be highly self-critical - self-compassion may be threatening (Boersma, Hakanson, Salmonsson, & Johannsson, 2015). One study, for example, found that after undergoing a compassionate imagery exercise persons high in self-criticism exhibited physiological responses indicative of threat arousal (Rockliff, Gilbert, McEwan, Lightman, & Glover, 2008). This finding is consistent with the notion that feelings of warmth and affiliation can be hard and even frightening for some people, particularly for those who are high in self-criticism (Gilbert, 2006). Thus, developing ways to screen patients for whom self-compassion may need to be offered with greater care, and with an emphasis on ‘safety’ strategies that can be employed should self-compassion become overwhelming, will be important.
Finally, it will be important to understand the mechanisms which underlie the effects of self-compassion interventions among diabetes patients. Drawing from the research more broadly, and as described in the preceding chapters, there is preliminary evidence to suggest psychological, behavioural and biological pathways may be implicated. Measurement and analysis of, for example, decreases in self-criticism or rumination, changes in motivation to maintain critical self-care or in direct biological processes such as alterations in inflammatory markers of stress following training in self-compassion, will be important next steps. Understanding these pathways may help clinicians to better target compassion-based interventions appropriately, and in ways that can then address a patient’s specific area of need.

8.5 Limitations

The studies outlined in this thesis have contributed to the extant literature on self-compassion, with cross-sectional and experimental works highlighting the fact that ‘kindness matters’, in improving mental and physical health outcomes among patients with diabetes. These contributions noted, the following observations highlight the fact that empirical knowledge regarding the clinical application of self-compassion to patient populations is in its infancy. When beginning an investigation of the utility of self-compassion among diabetes patients, a population already labouring under a large self-management burden, a number of practical decisions were made to increase the likelihood that patients would engage with the process. As discussed below, the decision to favour pragmatism over design purity at times means this work is not without its limitations. While several of these have already been noted in the preceding pages and in the published works, further limitations are briefly discussed below.

Firstly, all participants in the two patient studies were essentially self-selected, meaning that at some level they were attracted to the nature of the investigations.
Participants were unlikely to have been blind to the general hypothesis underlying the research and may have had an inkling that the studies were investigations of the utility of an attitude of self-kindness. Therefore, an ‘openness’ to the possibility that developing a more supportive self-relationship might be helpful was a likely commonality among those who took part and limits the generalizability of these findings to people with this interest. This limitation is consistent with emerging evidence that a predisposition toward self-compassion, reflected in higher trait self-compassion, will lead to greater benefit from training in self-compassion (Arch, et al., 2016) likely because self-compassion appears to be more readily teachable to those already higher in this trait (Gilbert, McEwan, Matos, & Rivis, 2011). On the other hand, those lower in the trait of self-compassion may have more “room to move” and may therefore gain the most benefit from training in self-compassion (Gilbert & Procter, 2006). It is possible that benefits of self-compassion training among patients in the RCT may have been more apparent in those who were higher in self-compassion to start with, although power considerations precluded moderational analysis.

In addition to the idea that the benefits of self-compassion may be more pronounced among those with a greater disposition towards insight-based practices, the notion of ‘dose’ responsiveness was not tested in the RCT. Emerging evidence suggests that the benefits of self-compassion training are dependent on how much one is prepared to practice (Germer & Neff, 2013). While the RCT delivery in the current thesis included general encouragement to practice (in the form of an email following each training session), participants were not asked to formally record the frequency or duration of practice. This limitation reflects a belief that participants were already likely coping with a substantial self-care regime and that attending an eight-week course was likely a serious additional demand on both time and motivation. Adding
another measurement requirement was deemed unwise in this patient group, although it does mean that these data were not then available for analysis.

Thirdly, the intervention study is limited by the absence of an active control group meaning that other factors, such as group support, increases in mindfulness or even clinician attention from the group facilitator, may have been responsible for results seen in the RCT. This is an important limitation in that it is not possible to know at this juncture if the effects of training in self-compassion were an effect of increased self-compassion per se. The inclusion of an additional intervention group in which participants were trained in Mindfulness Based Cognitive Therapy, or Mindfulness Based Stress Reduction would make it possible to test for between-group differences resulting from the explicit training in self-compassion, compared to group training in mindfulness alone.

8.6 Conclusion
This thesis has presented a body of work suggesting the capacity to be self-compassionate during times of suffering may be of health value to patients living with diabetes. Given that research on self-compassion in this patient group is very new, future research directions are numerous. As discussed above, studies that can elucidate precise mechanisms of change will provide critical guidance as the research unfolds. Furthermore, well-designed trials comparing self-compassion training to more traditional interventions such as cognitive behavioural therapy will add to the evidence for self-compassion as an alternative treatment approach. Overall, however, the capacity to wrap suffering in the warm embrace of kindness and compassion may offer benefits worthy of substantial future research endeavour, not just for people living with diabetes, but also for other chronically ill patient groups.
## Appendices

### Appendix A. Content of MSC Eight-week programme

| Week 1 | **Discovering Mindful Self-Compassion**  
- General introduction and guiding principles  
- Research and scientific background  
- Misgivings about self-compassion  
- Practising soothing through gentle touch. |
|--------|---------------------------------------------------------------|
| Week 2 | **Practicing Mindfulness**  
- Affectionate breathing meditation  
- Introduction to mindfulness  
- Practical mindfulness exercises (‘soles of feet ’and ‘here and now’ stone meditations) |
| Week 3 | **Practicing Loving Kindness**  
- Affectionate Breathing meditation  
Loving kindness and Compassion exercises and meditation |
| Week 4 | **Discovering Your Compassionate Voice**  
- Loving-kindness for ourselves meditation  
- Stages of progress in MSC  
- Self-criticism and safety  
- Motivating ourselves with compassion |
| Week 5 | **Living Deeply**  
- Giving and receiving compassion meditation  
- Discovering core values  
- Living with a vow  
- Finding hidden value in suffering  
- Compassionate listening |
| Week 6 | **Meeting Difficult Emotions**  
- Loving Kindness for ourselves meditation  
- Stages of acceptance  
- Strategies for meeting difficult emotions  
- Soften Soothe and Allow practice |
| Week 7 | **Exploring Challenging Relationships**  
- Compassionate friend meditation  
- Working with challenging relationships  
- Letting go of anger  
- Meeting unmet needs with self-compassion  
- Caregiving fatigue |
| Week 8 | **Embracing your Life**  
- Compassion for self and others meditation  
- Cultivating happiness  
- Savoring, gratitude and self-appreciation  
- What would I like to remember |
Appendix B. Self-Compassion Scale (Neff, 2003)

To Whom it May Concern:

Please feel free to use the Self-Compassion Scale in your research. Masters and dissertation students also have my permission to use and publish the Self-Compassion Scale in their theses. The appropriate reference is listed below.

Best,

Kristin Neff, Ph. D.
Associate Professor
Educational Psychology Dept.
University of Texas at Austin

e-mail: kneff@austin.utexas.edu

Reference:

Coding Key:
Self-Kindness Items: 5, 12, 19, 23, 26
Self-Judgment Items: 1, 8, 11, 16, 21
Common Humanity Items: 3, 7, 10, 15
Isolation Items: 4, 13, 18, 25
Mindfulness Items: 9, 14, 17, 22
Over-identified Items: 2, 6, 20, 24

Subscale scores are computed by calculating the mean of subscale item responses. To compute a total self-compassion score, reverse score the negative subscale items before calculating subscale means - self-judgment, isolation, and over-identification (i.e., 1 - 5, 2 - 4, 3 - 3, 4 - 2, 5 - 1) - then compute a grand mean of all six subscale means. Researchers can choose to analyze their data either by using individual subscale scores or by using a total score.

(This method of calculating the total score is slightly different than that used in the article referenced above, in which each subscale was added together. However, I find it is easier to interpret the total score if a mean is used.)
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:

<table>
<thead>
<tr>
<th>Almost never</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Almost always</th>
</tr>
</thead>
</table>

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.
References


