Examining the Impact of a Self-Compassion Intervention on Physical Activity Behaviour Among People with Prediabetes: A Pilot and Feasibility Study

by

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Abstract

People with prediabetes have an increased risk for developing type 2 diabetes (T2D). Regular physical activity (PA) can reduce their T2D risk. However, people with prediabetes experience barriers to physical activity (i.e., difficult emotions) which makes them less active. These emotions can interfere with the self-regulation of PA. Self-compassion (SC) may help people with prediabetes engage in PA and reduce their T2D risk through its association with adaptive emotional responses and enhanced self-regulatory abilities. No study has examined whether self-compassion training can augment behaviour change training to improve physical activity among people with prediabetes more than behaviour change training plus attention. I took the recommended step of assessing the feasibility and acceptability of this planned intervention to inform the larger trial that aims to determine this research question. Descriptive statistics were reported for most feasibility outcomes whereas transcribed exit-interviews using a thematic analysis addressed the acceptability and remaining feasibility outcomes. Most outcomes met our pre-determined criteria deeming the intervention feasible and acceptable with minor changes; recruitment rate, process time and adherence to home practice were below our criteria and we offer suggestions to improve these inadequacies for the larger efficacy trial. Means of key variables suggest that the measures included will be appropriate for the larger trial. Findings from this study offer support for the planned efficacy trial to be successful.

Key words: self-compassion, prediabetes, physical activity, feasibility, acceptability

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Introduction

Over the past few years, there has been significant development in literature on pilot/feasibility methodology. A general consensus from this literature is the necessity of conducting pilot/feasibility work as a preliminary step before investing intensive research efforts, time, money, and resources into a full-scale efficacy trial (Abbott, 2014; El-Kotob & Giangregorio, 2018; Thabane et al., 2010). This thesis represents the acknowledgment of this recommended research stage on the part of the research team in which I am involved and my efforts to conduct a pilot/feasibility study that adheres to current guidelines and recommendations emerging from this literature.

Inconsistent definitions of pilot and feasibility studies are quite common which can have negative implications for developing the direction and guidelines of a future randomized controlled trial (RCT) of this nature (Eldridge et al., 2016b). With these conflicting views and practices, researchers have sought out ways to correctly outline these types of studies for better usage. Although pilot and feasibility studies are often perceived as being synonymous (Thabane et al., 2010), they have unique differences. A *feasibility* study addresses the question of whether a future RCT can be completed, whether it is worth proceeding with it, and if it is, what are the necessary steps to proceed (Eldridge et al., 2016b). Specifically, it assesses whether a planned trial will be possible (feasible) to conduct (Abbott, 2014). Feasibility is an overarching model which is comprised of three types of studies: *randomized pilot studies* (i.e., conducting the planned RCT on a smaller scale with fewer participants randomized), *non-randomized pilot studies* (i.e., conducting the planned RCT on a smaller scale with fewer participants without randomization), and *other feasibility studies* (i.e., conducting a component of a future trial in some way; Eldridge et al., 2016b). A *pilot* study asks similar questions of those asked when

conducting a feasibility study with the motivation and purpose to examine feasibility (Eldridge et al., 2016a; Thabane et al., 2010); a subcategory of feasibility studies (Eldridge et al., 2016b). However, a pilot study has a distinctive design in that it remains a smaller version of a future RCT (Eldridge et al., 2016a); this smaller version consists of the same procedures as the planned trial but with fewer participants (Eldridge et al., 2016a; Eldridge et al., 2016b). Essentially, Eldridge and colleagues state that, "All pilot studies are feasibility studies but not all feasibility studies are pilot studies" (p 8) and they can be conducted using either quantitative or qualitative methodologies (Thabane et al., 2010). Additionally, when determining the feasibility of an intervention, researchers conducting pilot and feasibility studies can also explore the acceptability (i.e., tolerance of intervention components) for the planned trial (Eldridge et al., 2016b).

What do Pilot and Feasibility Studies Accomplish?

Pilot and feasibility studies are very instructive to ensure that a planned RCT is successful and feasible (Thabane et al., 2010); they achieve a greater understanding of the several aspects embedded within a study that help determine the sufficiency of a future trial. Thabane and colleagues (2010) outline key features of pilot studies and their aims. Specifically, pilot studies inform the *process* of the steps necessary for the main RCT, the *resources* required to fulfill requirements of the main RCT, the challenges and organization of *management* tasks of the main RCT, and lastly, the advancement of *scientific* investigation. Specific examples of these key features that pilot studies can examine include assessing recruitment and retention rates, process time, compliance, study personnel insight and challenges, fidelity, time and budget limitations, and intervention safety, capacity, and acceptability. Ultimately, if the pilot study

addresses these components of feasibility, it can inform whether modifications need to be made prior to conducting a planned RCT (El-Kotob & Giangregorio, 2018; Thabane et al., 2010).

Gaps

While the descriptions of pilot and feasibility studies are becoming more well-defined, researchers continue to inappropriately conduct (Thabane et al., 2010) and report findings of these studies (Eldridge et al., 2016b). Researchers often conduct pilot studies using inappropriate rationales (e.g., lack of resources for a full-scale trial; small study with a similar sample size of another published study, small study using no funding, etc.) and repeatedly ignore feasibility altogether (Thabane et al., 2010). Further, researchers conducting pilot studies have failed to achieve a satisfactory design. Specifically, researchers often fail to report clear predetermined criteria for their feasibility outcomes (El-Kotob & Giangregorio, 2018; Thabane et al., 2010) and alternatively, make ambiguous claims about the success of their outcomes (El-Kotob & Giangregorio, 2018). Establishing predetermined criteria of study outcomes is imperative to enhance and inform a planned full-scale trial (El-Kotob & Giangregorio, 2018). Thabane and colleagues (2010) highlight that over the years, researchers have mistakenly conducted pilot studies by focusing on statistical significance rather than assessing feasibility outcomes. Similarly, Sim (2019) mentions the common desire researchers have to assess treatment effect yet identifies that this is an inappropriate analysis when conducting pilot and feasibility studies and can ultimately produce unreliable evidence (e.g., misinform sample sizes; Thabane et al., 2010) if used for a main trial. These gaps address how researchers have failed to appropriately conduct pilot and feasibility studies. Therefore, it is imperative to suitably conduct these studies in accordance with current guidelines.

The Present Study

My thesis is a randomized, mixed methods, pilot and feasibility study aimed at determining whether a planned RCT will be feasible and acceptable. Ultimately, our research team is interested in examining whether we can improve behaviour change (i.e., ideal care) training by supplementing it with self-compassion training to see whether it leads to greater increases in physical activity than behaviour change training plus attention control exposure among people with prediabetes. Prior to testing this research question on a full-scale, the present study tested the feasibility and acceptability of conducting this planned intervention on a smaller scale. Results from the present study will inform whether the planned RCT can be done, and if so, how it can be best executed.

In this thesis, I will present literature that justifies the research question that will ultimately be tested in the planned RCT. Specifically, I define prediabetes and its associated health risks and highlight the importance of engaging in health behaviours, including physical activity, for people with prediabetes. Next, I discuss barriers to physical activity for people with prediabetes which includes the role of difficult emotions and self-regulation. Further, I review self-compassion and how it may be a suitable resource to help people with prediabetes self-regulate their physical activity. I also outline the gaps in the self-compassion literature that warrants a planned RCT among people with prediabetes. Lastly, I present how I aim to assess the feasibility of this planned RCT by following guidelines by Thabane and colleagues (2010). I clearly define predetermined criteria within these categories to achieve high standards for the planned RCT and report results using the CONSORT framework (Eldridge et al., 2016a; Eldridge et al., 2016b); data presented in the results section relate specifically to the pre-set

criteria. In my discussion, I reflect on the feasibility and acceptability of the planned RCT and address the modifications necessary for the future RCT to be successful and feasible.

Literature Review

Prediabetes and Diabetes

According to the Canadian Diabetes Association (2019), close to six-million Canadians are living with prediabetes. A person can be diagnosed with prediabetes when they have blood sugar levels elevated to a level that is just below the threshold for a type 2 diabetes (T2D) diagnosis (Canadian Diabetes Association, 2019). The existence of impaired glucose tolerance or impaired fasting glucose is another way that prediabetes can be defined (American Diabetes Association, 2019). Many complications can transpire in a prediabetic state, independent of the onset of a T2D diagnosis (i.e., prediabetes stage; Mahat et al., 2019). Some common health problems that can occur include neuropathy (i.e., nerve damage) and retinopathy (i.e., eye disease; Mahat et al., 2019). Additionally, people with prediabetes are at higher risk for developing early nephropathy (i.e., chronic kidney disease; Plantinga et al., 2010). Macrovascular complications are additional long-term risks that can accompany prediabetes (Mahat et al., 2019). For example, individuals with prediabetes are at an increased risk for developing cardiovascular disease (Bergman, 2014), stroke, and peripheral vascular disease (Brannick & Dagogo-Jack, 2018; Mahat et al., 2019). Prediabetes is also related to mental health concerns. People with prediabetes may experience symptoms of depression (Graham et al., 2015) which, in a prospective study (Deschênes et al., 2016) were found to be positively associated with the development of T2D. In the same prospective study, an increased risk of developing T2D was associated with high levels of anxiety among people with prediabetes (Deschênes et al., 2016).

A concerning statistic is that 50% of people with prediabetes will develop T2D within five years of their prediabetes diagnosis (Canadian Diabetes Association, 2019). T2D refers to the inability or inadequacy to produce insulin (i.e., regulates blood sugar levels; Canadian Diabetes Association, 2019), which is a global health concern (International Diabetes Federation, 2020). There are several complications associated with T2D (Canadian Diabetes Association, 2019). The Canadian Diabetes Association (2019) reports that T2D is associated with high blood pressure and high cholesterol, which, in turn, can lead to heart disease or stroke. High blood sugar levels, if uncontrolled, can lead to eye damage or even blindness (Canadian Diabetes Association, 2019). Long-term complications of T2D can include severe nerve damage, which can lead to infection or amputation of limbs if untreated (Canadian Diabetes Association, 2019). Having diabetes also puts people at increased risk for developing depression (Holt et al., 2014) and is related to mental health declines and reduced quality of life (Feng, & Astell-Burt, 2017). In addition to these health complications and risks, T2D puts people at increased risk for early mortality (International Diabetes Federation, 2020). Given these detrimental health complications associated with T2D, it is critical for people with prediabetes to reduce their risk.

Preventing T2D

Treatments are available to help people manage their T2D, but there is no cure. Common ways to manage T2D is through the use of medication (i.e., insulin), monitoring blood sugar levels, managing stress, having a healthy diet, and engaging in routine physical activity (Canadian Diabetes Association, 2019). Importantly, one can avoid the need for disease management altogether by taking steps to prevent T2D. According to Diabetes Canada (2019), more than 50% of people with prediabetes can prevent or delay the onset of developing T2D through changes to lifestyle. Poor lifestyle behaviours and diminished mental health influences

are associated with a higher risk for T2D (Galaviz et al., 2018). These factors, most modifiable, include smoking (Willi et al., 2007), time spent sitting (i.e., sedentary behaviour; Rockette-Wagner et al., 2015), perceptions of stress (Williams et al., 2013), and sleep difficulties (Boyko et al., 2013). Furthermore, engaging in physical activity (Schellenberg et al., 2013; Penn et al., 2013), eating healthy foods (Weickert & Pfeiffer, 2018), and losing weight (Cardona-Morrell et al., 2010; Grams & Garvey, 2015; Penn et al., 2013), if achieved, are also modifiable factors that people with prediabetes can employ to reduce their T2D risk (Galaviz et al., 2018).

A randomized controlled study on the prevention of T2D among people with prediabetes determined whether lifestyle intervention could prevent T2D (Tuomilehto et al., (2001). Tuomilehto and colleagues (2001) reported a 58% decrease in T2D incidence among people who made lifestyle changes such as losing weight, achieving healthy diet goals, and engaging in daily exercise (Tuomilehto et al., 2001). These findings suggest that the modifiable risk factors of dietary changes, weight loss, and physical activity are all important in preventing the progression of prediabetes into T2D.

Interestingly, research shows that regardless of diet and weight loss, people who engage in regular physical activity reduce their risk of T2D considerably (Lavie et al., 2013; Laaksonen et al., 2005; Lindstrom et al., 2003; Snitker, Mitchell, & Shuldiner, 2003). The most considerable support for this claim comes from randomized controlled studies (Laaksonen et al., 2005; Lindstrom et al., 2003), where causal claims are determined. One intervention study reported that, in comparison to a non-exercising control group, people with prediabetes who achieved small increases in leisure-time physical activity of moderate to high intensities (Lindstrom et al., 2003) showed improvements in blood glucose levels and decreases in diabetes prevalence (Lindstrom et al., 2003). In another study, people with prediabetes who engaged in the most

physical activity, compared to those who engaged in the least over four years, reduced their risk of T2D by 47% (Laaksonen et al., 2005). An essential finding of this trial was that physical activity of low intensity reduced the risk of T2D impartial of weight loss, diet, and moderate-to-vigorous leisure-time physical activity (Laaksonen et al., 2005). This suggests that lower-intensity physical activity alone may be enough to produce significant changes and prevent T2D.

Further support for physical activity and its function in preventing T2D comes from the exploration of Amish adults – a group known to live a physically active lifestyle (Snitker et al., 2003). Snitker et al. (2003) compared obese Amish adults with those from the general population who are similarly obese and reported that the Amish have only 50% of the prevalence rates of diabetes than the general population. These authors suggest that physical activity may act as a barrier against T2D, separate from body mass index and diet (Snitker et al., 2003). Another study reported that people with prediabetes who did not lose weight during a randomized-controlled intervention had a significant reduction in their risk for T2D, which correlated with engaging in physical activity four hours or more per week (Tuomilehto et al., 2001). These authors suggest that the benefits of preventing T2D may come from various forms of physical activity (Tuomilehto et al., 2001). Furthermore, controlling weight, perhaps through physical activity, rather than losing weight, is a recommended management strategy for people with prediabetes (Lindstrom et al., 2003).

Self-Regulation of Physical Activity among People with Prediabetes

Despite the strong case that can be made for the role of physical activity in preventing the progression of prediabetes to T2D, people with prediabetes do not engage in adequate levels of physical activity and are less active than the general population (Chasens & Yang, 2012; Hu et al., 2018). As a health behaviour, physical activity can be a challenging target even for the

general population (Zhang et al., 2010) because it requires constant self-regulation (Terry & Leary, 2011). Self-regulation is a form of behavioural control (Baumeister, & Heatherton, 1996) that plays a vital role in helping people adhere to health behaviours, including physical activity (Terry & Leary, 2011). In general, to successfully self-regulate physical activity, one must set suitable goals, engage in goal-directed behaviour, monitor goal progress, and make changes to behaviour when necessary (Terry & Leary, 2011). Given the involved nature of self-regulation, it is not surprising that almost half of Canadians (45.4%) do not meet the recommended physical activity levels (Statistics Canada, 2020).

People with prediabetes can learn and utilize self-regulatory skills such as planning and building self-efficacy, for example, which can help them successfully change their behaviour (Jung et al., 2015). Specifically, interventions that target behaviour change skills (i.e., self-monitoring, strengthening self-efficacy, planning etc.) among people with prediabetes have led to increases in physical activity (Bourne et al., 2019; Jung et al., 2015; Locke et al., 2018). Although behaviour change training used in the aforementioned studies has led to changes in physical activity behaviour among this population, people with prediabetes continue to face self-regulatory challenges.

Adhering to physical activity may be *even more challenging* for people with prediabetes than people in the general population. Indeed, this group must self-regulate physical activity while confronting the challenges and threats to their health posed by being at-risk for T2D (Chasens & Yang, 2012; Terry & Leary, 2011). People's ability to self-regulate behaviour can predict engagement in physical activity among people with chronic conditions (Kosteli et al., 2017). Though, the ability to meet health recommendations (i.e., physical activity guidelines) can be compromised when self-regulation of these behaviours is impaired (Tran et al., 2014).

Furthermore, in trying to engage in multiple health behaviours at once (i.e., healthy eating, physical activity), people may also experience self-regulatory difficulties and even failure. For example, increased risks of self-regulatory failure and failure to engage in physical activity can occur when trying to change and incorporate multiple target behaviours at once (Castonguay et al., 2018). This can diminish self-regulation altogether (Baumeister, & Heatherton, 1996).

People with chronic conditions, including people with prediabetes and T2D, experience barriers that interfere with their ability to self-regulate their health behaviours, including physical activity. For example, some people with chronic obstructive pulmonary disease (COPD) have lower levels of physical activity due to barriers including physical limitations, lack of physical activity-related knowledge, and psychological and emotional influences from their chronic condition (Kosteli et al., 2017). Other barriers, such as financial constraints or low income, can impact whether people with chronic conditions adhere to health behaviours (Campbell et al., 2014). Among people with T2D, the inability to self-regulate can diminish the capacity for engagement in self-care behaviours, such as exercising and seeking professional health attention (Tran et al., 2014). Furthermore, Chasens and Yang (2012) identified that some people with prediabetes experience symptoms of insomnia, which in turn impedes their ability to adhere to physical activity. Korkiakangas and colleagues (2011) report that health complications, time constraints, lack of interest, and weather/season are also included as factors that act as barriers to physical activity among people with prediabetes (as cited in Kuo et al., 2014). These findings highlight the various barriers to health behaviour engagement and the importance of self-regulation for people with chronic conditions. Interestingly, emotions and reactions concerning one's chronic disease, including prediabetes, may also act as a barrier to physical activity. This

may provide further insight as to why people with prediabetes struggle with physical activity and are less active than the general population.

Negative Affect

One category of challenges that may make it particularly difficult for people with prediabetes to self-regulate physical activity is the experience of negative emotions[1]. People with prediabetes experience a myriad of reactions and emotions regarding their diagnosis and experience, especially with the challenges of implementing physical activity in their lives (Kuo et al., 2014; Strachan et al., 2018). Researchers reported that people with prediabetes or T2D experience various responses regarding their T2D risk (Andersson et al., 2008; Strachan et al., 2018; Troughton et al., 2008) and T2D diagnosis (Eborall et al., 2007; Peel et al., 2004). Among people diagnosed with T2D, some report feeling scared and shocked about the news, and also report anxieties about their health (Peel et al., 2004). Conversely, some people report downplaying the seriousness and severity of their diagnosis entirely (Eborall et al., 2007). In regard to people with prediabetes, some initially deny their T2D risk (Strachan et al., 2018) or feel self-critical and guilty for the unhealthy behavioural choices they previously made that directed them to their diagnosis (Andersson et al., 2008; Strachan et al., 2018). Further, people with prediabetes express concerns and fears about their future health (Strachan et al., 2018; Troughton et al., 2008) with some conveying fears about developing T2D if they are not

[1] Throughout this thesis, several related terms are used to describe how people feel. These terms include difficult emotions, negative affect, negative emotions, undesirable emotions, and adverse emotions. Emotions are episodes of state changes in response to specific appraisals of internal or external occurrences with a cognitive/reflective component (Scherer, 2005). Affect is more general and does not include a cognitive and reflective aspect (Russell & Feldman Barrett, 2009). Researchers often measure both affect and emotions. In the planned efficacy trial, the research team will measure negative affect and use this term when referring to the planned hypotheses of secondary outcomes.

successful in physical activity engagement (Kuo et al., 2014). Furthermore, people with prediabetes express distress (Strachan et al., 2018; Troughton et al., 2008) and lack of confidence (Andersson et al., 2008) about changing their behaviours.

Challenging emotions such as those documented among people with prediabetes can interfere with self-regulation and its resources (Schmeichel, 2007). Researchers document a variety of ways in which emotions can interfere with self-regulation. For example, the experience of difficult reactions can diminish people's capability to avoid temptations (Bruyneel et al., 2009) and self-monitor behaviour (Schmeichel, 2007) as difficult emotions can direct peoples' focus away from their goals.

The detrimental effects of some emotions on self-regulation have been found in the context of health behaviours. For example, someone may stop self-regulating their diet altogether as a result of experiencing shame, harsh self-assessments, and reactive eating from not following their diet suggestions (Polivy et al., 2010). Additionally, Bruyneel et al. (2009) report that negative emotions can impair one's ability to make behavioural decisions in general. In light of the myriad of emotions experienced by people with prediabetes (e.g., Strachan et al., 2018), and the detrimental effects these emotional responses can have on self-regulation, it seems imperative to find a way in which people with prediabetes can manage their emotions to effectively self-regulate their behaviour during this critical time-point. Effectively managing their emotions may help people with prediabetes self-regulate their physical activity behaviours to help mitigate their T2D risk.

Self-compassion should serve as a self-regulatory resource (Terry & Leary, 2011) for people with prediabetes. First, because people with prediabetes can experience challenges to self-regulation, they may benefit from self-compassion as this variable is known to facilitate self-

regulation (Terry & Leary, 2011). Second, self-compassion should help people with prediabetes cope with the emotions associated with their health risk and the challenge of increasing their physical activity, because self-compassion can facilitate greater adaptive emotion regulation (Inwood, & Ferrari, 2018).

Self-Compassion

Finding its roots in Buddhist philosophy, Neff (2003a) defines self-compassion as caring for oneself as one encounters challenging life experiences. In the face of challenges, self-compassion allows people to offer sympathy and understanding to themselves rather than being critical of their faults. Three cohesive parts encompass self-compassion: self-kindness, common humanity, and mindfulness. These components are unique and important as separate parts. However, altogether, they interrelate and augment one another (Neff, 2003a).

Self-kindness refers to offering oneself care and understanding in the face of failure or challenge rather than being self-critical and judgmental about one's faults. When embracing self-kindness, people with prediabetes who exercise self-compassion may forgive themselves for certain behaviours (e.g., physical inactivity, poor nutrition) that may have contributed to their risk of T2D. Furthermore, self-kindness may allow people with prediabetes to be calm and understanding with themselves if they encounter struggles to engage in physical activity.

Viewing failures and challenging times as shared experiences embodies the *common humanity* component of self-compassion (Neff, 2003a). Rather than seeing one's experience as unique, common humanity allows people to recognize that the struggle is universal and unites us with others (Neff, 2003a). Through focusing on common humanity, people with prediabetes may take comfort in knowing that others also face the same challenging circumstances. They should also recognize that even if others do not face these same specific challenges, they face their own

version of struggle, and that struggle is a shared universal experience. The acceptance of common humanity should help them to normalize their struggles of experiencing a health threat and those that come with their attempts to be more physically active.

Lastly, the *mindfulness* component of self-compassion refers to being attentive to one's thoughts and emotions as they arise (Neff, 2003a). However, in attending to these reactions, mindfulness allows one to do so with balance rather than persisting awareness or lack of awareness. This component permits one to neither overthink nor avoid their reactions and emotions. Mindfulness should help people with prediabetes be non-judgmentally cognizant of difficult reactions and feelings that they often face (Strachan et al., 2018) rather than ignoring or ruminating about them. The challenges faced by people with prediabetes make it difficult for them to cope with their health risk and self-regulate their physical activity behaviours. Through its three components, self-compassion holds the potential to be a beneficial resource for people with prediabetes.

Research on Self-Compassion

Self-compassion has proven to be a useful resource across a variety of domains. Researchers report the importance of self-compassion in the domains of mental health and psychotherapy (Macbeth & Gumley, 2012), education (Eraydın, & Karagözoğlu, 2017; Jennings, 2015), and sport and exercise (Ferguson et al., 2015; Semenchuk et al., 2018). Of critical importance is the benefit self-compassion has exemplified in the health domain as it is useful in individual's physical health and well-being (Hall et al., 2013; Homan, 2016; Terry & Leary, 2011).

Self-Compassion and Health Behaviours

Within the context of health, self-compassion has consistently associated with a variety of health behaviours (Dunne et al., 2016; Sirois & Hirsch, 2018; Sirois et al., 2015a; Terry & Leary, 2011). Self-compassion has been linked to seeking medical attention when faced with an illness or health threat and adhering to medical advice. People who are self-compassionate report a greater likelihood of pursuing medical care when experiencing symptoms compared to those who are less self-compassionate (Terry et al., 2013). Self-compassionate people, including those with chronic diseases (Brion et al., 2014) are also more proactive in that they follow the advice and suggestions from their doctor (Brion et al., 2014; Terry et al., 2013).

A finding that is especially relevant to this thesis is that self-compassion has been linked to engagement in health-promoting behaviours, including physical activity. A correlational analysis among 15 independent student and community samples by Sirois et al. (2015a) revealed greater engagement of health-promoting behaviours (e.g., physical activity, healthy eating, and sleep) among those who were more self-compassionate. In their cross-sectional study, Miller and Strachan (2020) found an association between self-compassion and an inventory of health behaviours including physical activity, stress management, sleep, and healthy eating among mothers of young children. Further, a systematic review and meta-analysis revealed that physical activity (r = .26) and physical activity behaviour regulation (r = .29) were both associated with self-compassion (Wong et al., 2020). Little research has examined self-compassion and physical activity among people with chronic diseases. Three exceptions are recent cross-sectional findings where self-compassion was associated with physical activity among people with diabetes (Ferrari et al., 2017; Ventura et al., 2019) and women at risk for cardiovascular disease (Semenchuk et al., 2020). Although reporting a cross-sectional relationship, the latter study by Semenchuk et al.

(2020) provides objective evidence, through the use of accelerometers, for a relationship between self-compassion and engagement in moderate-to vigorous physical activity (MVPA).

The strongest available evidence for the role of self-compassion in promoting health behaviours, including physical activity, comes from intervention studies where a causal relationship is supported. First, significant increases in self-reported health behaviours (e.g., leisure-time physical activity, mindful eating, mindful exercise, etc.) were reported after a 10-week mindful and self-compassion pilot intervention study. However, follow-up assessments were not evaluated to determine if these effects were maintained (Horan & Taylor, 2018). Further, a systematic review by Biber and Ellis (2019) demonstrated the effectiveness of seven self-compassion interventions at improving the self-regulation of various health behaviours (i.e., overeating, smoking cessation, physical activity, self-care behaviours). Biber and Ellis (2019) reported on only one intervention study that targeted and led to improvements in the self-regulation of physical activity. This intervention did not assess physical activity maintenance at a follow-up time, nor did it explicitly focus on self-compassion (mindfulness-based). No study, to my knowledge, has addressed the influence of a self-compassion intervention on physical activity behaviour which highlights a significant gap in the literature. Biber and Ellis (2019) further express the need for this research to help improve the health of our population by educating physical activity adoption and adherence.

The importance of the association between self-compassion and engagement in health-promoting behaviours, including physical activity, is punctuated by the findings that health-promoting behaviours mediate the relationship between self-compassion and physical health (Dunne et al., 2016; Homan & Sirois, 2017). Cross-sectional findings by Dunne and colleagues (2016) found that higher scores on self-compassion were related to greater engagement of health-

promoting behaviours (i.e., exercise, sleep, and healthy eating) and, in turn, fewer physical symptoms. Similarly, Homan and Sirois (2017) replicated these findings and also found that health behaviours, including physical activity, mediated the relationship between self-compassion and physical health.

Mechanisms of Self-Compassion and Health Behaviours

It is imperative to understand the mechanisms through which self-compassion relates to health behaviours, including physical activity. Such information will enhance our understanding of how self-compassion functions (Sirois et al., 2015a; Terry et al., 2013). There are two mechanisms through which self-compassion may help people with prediabetes engage in physical activity: adaptive emotional responses and improved self-regulation.

First, self-compassion should help people with prediabetes engage in physical activity through promoting adaptive emotions. People with chronic health conditions who report high self-compassion experience less distress (Sirois et al., 2015b; Ventura et al., 2019) and use more adaptive coping strategies which in turn leads to lower levels of stress concerning their health condition (Sirois et al., 2015b). Similarly, among a clinical population, self-compassion's association with adherence to medical recommendations was partly mediated by lower levels of stress (Sirois & Hirsch, 2018).

Stronger support for the idea that affective variables may mediate the relationship between self-compassion and physical activity comes from longitudinal and experimental designs. Self-compassion prospectively predicts reduced shame (Kelly et al., 2014) and malleable emotional responses that may have optimal effects for people with chronic conditions (Sirois & Rowse, 2016). A randomized controlled trial by Friis and colleagues (2016) found that teaching self-compassion to people with diabetes (i.e., type 1, type 2) led to increased self-

compassion and decreased depressive symptoms and diabetes-related distress; these effects were sustained for three months. Similarly, Whitebird and colleagues (2018) reported improvements in diabetes-distress after a mindfulness-based stress reduction intervention among people with T2D. In light of these findings, it seems likely that self-compassion should help people with prediabetes engage in physical activity through this constructs' mitigating effect on negative reactions and distress.

A second mechanism through which self-compassion may lead to increased physical activity is through enhancing self-regulatory abilities. Self-compassion was cross-sectionally related to exercise goal re-engagement after failing to do so in the past (Semenchuk et al., 2018). Further, self-compassion relates to individuals prioritizing their health by pursuing medication care and adhering to medical treatments (Brion et al., 2014; Semenchuk et al., 2020; Sirois & Hirsch, 2018; Terry et al., 2013). Given that self-compassion is positively associated with a variety of self-regulatory skills, it should lead to greater physical activity among people with prediabetes.

Self-compassion may be a valuable resource for people with prediabetes as it should help people engage in the physical activity that can improve their health (Ferrari et al., 2017; Ventura et al., 2019) and decrease their chances of developing T2D (Kuo et al., 2014). People with prediabetes face barriers to physical activity (Chasens & Yang, 2012; Korkiakangas et al., 2011) and experience reactions about their prediabetic-state and diagnosis (Strachan et al., 2018) that make it difficult for them to self-regulate their physical activity (Schmeichel, 2007). Therefore, people with prediabetes may *especially* benefit from self-compassion, given its role in enhancing self-regulation (Terry & Leary, 2011). Furthermore, people with prediabetes represent a practical target for intervention because they can substantially reduce their T2D risk through changes in

lifestyle behaviours including physical activity (Canadian Diabetes Association, 2019; Laaksonen et al., 2005; Lindstrom et al., 2003; Snitker et al., 2003).

Addressing Research Gaps Through the Planned Trial

A recent scoping review by Morgan and colleagues (2020) examined self-compassion and health behaviours among people with prediabetes, type 1 diabetes, T2D, and gestational diabetes. They found that from the eleven studies examined (N = 3488), self-compassion is associated with and leads to adaptive behavioural and affective responses among people with diabetes (Morgan et al., 2020). Although self-compassion should help people with prediabetes self-regulate their physical activity, Morgan et al. (2020) also identified several gaps in the existing self-compassion literature with this population. Only two studies within this review examined self-compassion interventions which established significant decreases in blood glucose levels (e.g., Friis et al., 2016; Karami et al., 2018). However, these two intervention studies were among people with diabetes, not prediabetes; neither focused on physical activity as an intervention outcome. Further, of the studies included in the review, only one was conducted among people with prediabetes which identifies a dearth of research on self-compassion and people with prediabetes, specifically. Therefore, there is a need to examine whether a self-compassion intervention can improve physical activity among people with prediabetes. Research by Biber and Ellis (2019) supports the effectiveness of self-compassion interventions at increasing health behaviours, including physical activity. However, they, too, call for more self-compassion interventions to determine differences between groups on health behaviours, specifically randomized controlled trials.

Further, while self-compassion interventions have shown to have positive impacts on aspects of self-regulation and actual engagement in health behaviours (Biber & Ellis, 2019)

including self-reported physical activity (Horan & Taylor, 2018), no research has examined whether self-compassion can augment behaviour change skill training (e.g., goal-setting, planning, self-monitoring, etc.). Training in these types of skills has proven effective in increasing physical activity levels of people with prediabetes (Bourne et al., 2019). I reason that self-compassion training may have added benefit over and above teaching behaviour change skills. Behaviour change skills tell people *how* to change behaviour; self-compassion gives people a productive, helpful *way of relating to themselves* (Neff, 2003a) while they try to change their behaviour. In providing this supportive environment, self-compassion should facilitate people's deployment of behaviour change skills as they self-regulate their physical activity.

Self-Compassion as an Intervention Target

Research by Strachan et al. (2018) suggests that people with prediabetes are receptive to and could benefit from being self-compassionate in relation to their disease status and health behaviours. In their qualitative study (Strachan et al., 2018), people with prediabetes report being self-critical about their past health behaviours expressed an openness to self-compassion during their struggles centered around accepting their diagnosis and their efforts to engage in health behaviours, including physical activity (Strachan et al., 2018). These findings further suggest that this population, too, may accept self-compassion and benefit from it.

It is worth noting that self-compassion is a variable that can be targeted through intervention. Self-compassion is malleable (Brion et al., 2014) and can be taught through easy, low-cost strategies (Biber & Ellis, 2019). Small increases in self-compassion promote health behaviours, including physical activity, with effects lasting as long as six months (Biber & Ellis, 2019), which makes it an ideal focus for interventions. Additionally, self-compassion interventions have low attrition rates when compared to other interventions on health behaviour

change (Biber &Ellis, 2019). Further, Biber and Ellis (2019) suggest that self-compassion interventions are applicable for increasing physical activity and request this type of research.

Purpose

Ultimately, my advisor and her research team aim to test the efficacy of a self-compassion intervention at increasing physical activity among people with prediabetes. Using a randomized controlled design, they will examine whether teaching people with prediabetes to use self-compassion augments regular behaviour change training (Bourne et al., 2019) in bringing about changes in physical activity more so than regular behaviour change training along with control attention. Due to the lack of self-compassion research among people with prediabetes, the primary purpose of *this* study was to assess the feasibility and acceptability of this future randomized efficacy trial. According to Eldridge and colleagues (2016b), "A feasibility study asks whether something can be done, should we proceed with it, and if so how" (p. 8). Assessing feasibility and acceptability outcomes are the main focus of pilot studies (Thabane et al., 2019). Therefore, through this study, I was able to determine the feasibility and acceptability of the planned efficacy trial which allowed me to determine whether the efficacy trial should proceed and to identify any changes that are required; this will ultimately inform the planned future efficacy trial (Thabane et al., 2010). It is imperative to conduct pilot studies and assess feasibility outcomes, like this one, to ensure the larger trial is of high quality (El-Kotob & Giangregorio, 2018). As a secondary and exploratory objective, I will report means and standard deviations on key study variables for the efficacy trial (i.e., secondary outcomes) to allow for an observation of the appropriateness of the measures and associated data that we can expect in the larger trial (e.g., ceiling effects, issues with measure interpretation or mean calculation etc.). However, it is important to acknowledge that the goal of this study was not to compare groups or

examine pre-post changes on study outcomes as doing so would be inconsistent with the objectives and abilities of pilot studies (Thabane et al., 2010). I hypothesized that the planned intervention would be feasible and acceptable.

Anticipated Contributions

My thesis will assess feasibility and acceptability outcomes that will help us refine a larger efficacy trial which has the goal of determining whether self-compassion training can augment a behaviour change intervention in terms of its effects on physical activity among people with prediabetes. This feasibility trial is essential to determine whether it is realistic or achievable to conduct a larger trial (El-Kotob & Giangregorio, 2018) and will be the first randomized-controlled self-compassion intervention that examines feasibility outcomes among people with prediabetes. Further, it will allow us to identify and alter other modes of assessment (i.e., recruitment, intervention content, compliance, etc.) if it is found that our outcomes do not meet the specified feasibility criteria.

Although my thesis will not accomplish this, it is important to briefly consider the implications of what this feasibility study can inform. The future, larger trial, will add to the limited literature on self-compassion and the self-regulation of health behaviours among people with chronic conditions and will provide the first quantitative examination among people with prediabetes (Morgan et al., 2020). Seeing as people with prediabetes can prevent or prolong T2D (Canadian Diabetes Association, 2019), it will lead to a greater understanding of the mechanisms that help explain how self-compassion can lead to engagement in health behaviours, like physical activity. It will also add to findings by Sirois et al. (2015a) and extend their work per requesting interventions that yield similar effects of self-compassion on health behaviours through positive emotions.

The larger efficacy trial should have implications for clinical and theoretical purposes, future research, and practical application among people with prediabetes, diabetes, or other clinical populations with or at-risk for chronic conditions. For example, the larger trial will provide theoretical support for self-compassion's role in the self-regulation of health behaviours (Terry & Leary, 2011). Further, the findings from the larger trial may apply to people at risk for or with other chronic conditions who would also benefit from physical activity (e.g., cardiovascular conditions). If supplementing behaviour change efforts with self-compassion training proves useful for increasing physical activity, its effect on other health behaviours that can also positively impact disease risk and progression (e.g., nutrition, stress management) could also be explored. Practical implications of this larger trial could include adding self-compassion training to existing effective behaviour change interventions for people with prediabetes, or other chronic health conditions to increase physical activity if a larger trial hypotheses are supported. Upon conducting a larger trial, these findings could ultimately shape treatment for people with prediabetes to prevent a T2D diagnosis.

Methods

Design

This mixed methods study tested the feasibility and acceptability of a two arm, randomized, single-blind, actively controlled, 6-week online intervention. To assess feasibility and acceptability, I conducted a smaller version (i.e., fewer participants) of the planned trial (Eldridge et al., 2016a); participants underwent the same procedures as are planned for the efficacy trial, including randomization to an intervention group, participation in 6 intervention sessions and measurement of study variables at baseline, intervention-end and 6-and 12-weeks after the intervention. This allowed us to observe the feasibility and for participants to experience

all aspects of the planned intervention. Further, to assess acceptability and some aspects of feasibility, participants of my study completed either an exit-questionnaire or interview. This study adhered to Consolidated Standards of Reporting Trials (CONSORT; Eldridge et al., 2016a; Eldridge et al., 2016b).

Participants

Given that the purpose of pilot studies is to assess feasibility and acceptability outcomes for a future trial, not to be powered to conduct inferential analyses (Thabane et al., 2010), there was no official calculation for sample size conducted for this study. Therefore, I intended to attain a sample of approximately 20 people which aligns with feasibility studies of a similar design (Boggiss et al., 2020; Brooker et al., 2020) from the community who live with prediabetes.

Participants for the pilot and feasibility study had to meet the same inclusion/exclusion criteria as would participants in the planned trial (see Table 1): (i) prediabetes status (i.e., moderate to high risk of developing T2D) as determined by the CANRISK assessment tool (Canadian Pharmacists Association, 2011); (ii) between the ages of 40-74 years, as this is the age range recommended for prediabetes screening; (iii) no receipt of medical treatment for T2D; (iv) could safely engage in physical activity (Jamnik et al., 2011) which was determined through the PAR-Q-+ (Appendix C.2); (v) not participating in any T2D or behaviour change education that may affect the outcome; (vi) available for all required sessions and testing; (vii) did not meet the physical activity guidelines of 150 minutes of MVPA or more per week (Tremblay et al., 2011), and (viii) below the normative mean (3.6 or lower) on self-compassion (Neff & Tóth-Király, in press) to ensure that people had the potential to benefit from a self-compassion intervention.

Measures

Demographics Measures

Participants provided information about their age, and anthropometrics (i.e., weight, height), which was measured through the CANRISK assessment tool (Canadian Pharmacists Association, 2011). Additionally, participants reported their level of education, ethnicity, relationship status, and gender. Participants' gender was measured by assessing sex assigned at birth, current gender identity, and gender conformity (The GenIUSS Group, 2014). Demographic variables were collected at the beginning of the study (see Appendix D and Table 2). See Table 3 for participant baseline demographic and clinical information.

Primary Outcomes: Feasibility

Thabane and colleagues (2010) categorize feasibility outcomes under four general groups (i.e., process, resources, management, and scientific). I used this categorization to determine the feasibility outcomes to be used in the present study. *Process* involves assessing "The feasibility of the steps that need to take place as part of the main study", *resources* relate to "Assessing time and budget problems that can occur during the main study", *management* involves uncovering "Potential human and data optimization problems", and *scientific* pertains to dealing "With the assessment of treatment safety, determination of dose levels and response, and estimation of treatment effect and its variance" (p. 2-3). Feasibility outcomes were analyzed using quantitative methods. We also sought to assess aspects of acceptability (e.g., participant tolerance of aspects of the intervention) and these outcomes were assessed through qualitative methods. Assessing the acceptability of pilot studies is valuable and recommended (Lancaster et al., 2004) and has been examined in other self-compassion studies of a similar nature (Boggiss et al., 2020).

Process

Recruitment Rates. Recruitment involves the steps taken to generate and maintain a collection of participants to partake in a group (Dineen & Soltis, 2011) – in this case, the present study. I assessed the number of participants screened/who showed interest in partaking in this study (i.e., uptake) during the recruitment period and how many of these individuals were successfully recruited into the study. I also determined the average time to form an adequate number of participants in a group; 14-20 participants was our required criteria per month. To understand the number of people that need to be screened for the future efficacy trial, I determined at what step in the eligibility process people were deemed ineligible. Further, I determined the number of eligible participants who were recruited in the study (expressed as a percentage); this allowed me to determine whether the eligibility criteria were sufficient or too restrictive. Further, I determined the most successful recruitment strategy. This was assessed by asking participants to "Please state on the line below where you heard about this study" in the eligibility questionnaire. These responses were summed and identified the most and least successful recruitment strategy.

Process Time. Process time was determined by assessing how much time it took to enroll a participant into a condition. Criteria for this was set to 2-3 weeks (i.e., eligibility questionnaire, PARQ+, 8 days for accelerometer wear).

Resources

Retention Rates. Through quantitative assessment, I determined retention rates (i.e., rate of study completion; Seidman, 2012). I assessed the number of eligible participants who began the study relative to the number who dropped out (i.e., left the study prematurely; Seidman, 2012) at any point during the study expressed as a percent. Further, I examined retention by

condition and time of dropout (i.e. pre, during, and post-intervention) and categorized whether drop-out was due to withdrawal or loss to follow-up. The criteria to determine acceptable retention rates was based on an assumed drop-out rate of 15-20% during the intervention and an additional 10% drop-out rate at 6- and 12-weeks follow-up. This target rate is based on a systematic review of self-compassion interventions for health behaviours (Biber & Ellis, 2019) and a physical activity group intervention conducted with people with prediabetes called Small Steps for Big Changes (Small Steps for Big Changes, 2014). To understand why participants dropped out of the study (i.e., stopped attending), I emailed those particular participants asking to provide a rationale, if they are willing.

Compliance/Adherence Rates. This feasibility outcome was determined through tracking of class attendance and through participant responses to the text messaging system (e.g., responding 'yes' or 'no' to "did you complete your at-home activity this week?"). An acceptable criterion for these two components was 80% for homework completion and attendance. This criterion is similar with previous studies (e.g., Bluth et al., 2015; Campo et al., 2017). Compliance was also determined by assessing who wore their accelerometer for 4 days, 10 hours per day out of the total eight days (Troiano et al., 2008); anything less is considered below our criteria. Of those that were given an accelerometer, 80% needed to wear it to meet this criterion.

Management

Instructor Fidelity. This objective refers to how well facilitators conducted class sessions and activities in comparison with the set protocol (El-Kotob & Giangregorio, 2018). This was determined by a *facilitator checklist* consisting of a pre-determined protocol for each session where facilitators identified what components they did/did not complete and whether they followed session protocol accordingly (see Appendix I). For example, they kept track of the

length of their group sessions and recorded whether they stayed within the time-limit (i.e., 60-90 minutes). Criteria for this was set at 90-95% adherence to all intervention topics (Waltz et al., 1993). With participants approval, the research assistants and facilitators recorded all sessions and meetings. The principal investigator watched and assessed four one-on-one meetings (22%) and two group sessions, one from each condition (20%; Waltz et al., 1993). The principal investigator assessed the adherence to the planned intervention, presentation skills (e.g., pacing, tone), and rated communication skills. Each of those components were rated on a 5-point scale (Appendix H). A score of five was equivalent to an *exceptional* score whereas a score of one is considered *very poor*. Research assistants and facilitators were required to receive a total assessment score of four out of five to meet this criterion.

Capacity. This feasibility outcome was defined as identifying how much study personnel time was required to complete study tasks (Thabane et al., 2010). Capacity was determined by identifying the approximate hours it took study personnel to send text messages, emails, or phone calls. Research personnel also kept track of the hours it took them to complete accelerometer drop-offs/pick-ups and conduct one-on-one meetings and group sessions. The criteria for this was determined by evaluating the number of hours it takes study personnel to complete study tasks; if the total number of hours falls within or below the study budget, this criterion will be achieved.

Scientific

Study Personnel Challenges and Insights. Through a semi-structured exit-interview (described later), I asked facilitators to determine whether they encountered any challenges throughout the study sessions or whether they had any recommendations. I also used this opportunity to ask facilitators what they thought went well throughout the study. An example

question included: “What, if any, aspects of the study did you find difficult to implement?”. Further, when interviewing session facilitators, another sample question that was included was: “Which, if any, intervention activities did participants get the most engaged with?” (see Appendix F for subsequent interview questions).

Safety. To determine whether participants felt safe while participating in this study, they were asked to explain their thoughts and feelings through a semi-structured exit-interview. A sample item included, “Please explain whether there was anything in the group sessions that made you feel comfortable, welcomed, or connected to the group” (Appendix G). All participants (100%) needed to feel safe and comfortable during all sessions to meet this criterion.

Lastly, the component of acceptability was included as an additional feasibility criterion that is relevant to all the aforementioned feasibility outcomes. However, this outcome is not captured under the four general groups highlighted by Thabane and colleagues (2010). Therefore, it will be excluded from those four categories and is addressed on its own.

Acceptability

To determine the acceptability of the trial (i.e., participant satisfaction and experience; El-Kotob & Giangregorio, 2018), participants were asked questions to understand their thoughts and feelings about the study when partaking in the semi-structured exit-interview. For example, participants were asked, “What was your overall impression of the intervention?” or “Please explain which topics, if any, you enjoyed learning about the most?”. Another sample item that was included in both the exit-interview and open-ended questionnaire was, “Please explain what your thoughts are about the *length of each session* (i.e. too long, too short, just right)”. (Please see the subsequent questions in Appendix G).

Eligibility and Baseline Measures

A list of all measures and questions asked for eligibility and baseline are included in Table 2 and Appendix C.

CANRISK Assessment Tool

The CANRISK assessment tool assessed whether people were at risk for T2D (Canadian Pharmacists Association, 2011; See Appendix C.1). This assessment tool was used solely to determine eligibility, identify risk factors for demographic purposes and to facilitate the conversation about participants' T2D risk during the first session of this intervention. Based on risk factors for Canadians between 40-74 years old, the CANRISK assessment tool classifies an individual to be at mild, moderate, or high risk of T2D development. This tool consists of 12 items where participants responded using multiple choice. Some examples of questions included in the online version of the CANRISK assessment tool include prominent risk factors based on age, sex, body mass index, physical activity, diet, and family history of diabetes. To determine risk scores, each response had number assigned to it which was added to create a total score. A total score between 21-32 identified a moderate risk to T2D whereas a score of 33 and above identified those with a high risk of T2D (Canadian Pharmacists Association, 2011). This tool has been shown to be valid with good predictive validity (AUC = 0.75; Robinson et al., 2011). The CANRISK assessment tool is authorized by the Public Health Agency of Canada (Robinson et al., 2011) and has been effectively used in research among different populations (Agarwal et al., 2018; Jiang et al., 2017).

International Physical Activity Questionnaire

To assess participants' physical activity behaviours (to determine those who may be eligible), the Short-Form International Physical Activity Questionnaire (IPAQ) was employed

(Forde, 2018; see Appendix C.3). The 4-item IPAQ short-form was used to determine self-reported physical activity levels of potential participants. This scale assessed walking, moderate-intensity, and vigorous-intensity activities over the last 7-days. Total scores were created for each intensity separately by multiplying each intensity by its respective MET value and by the number of days per week; a total score was then calculated by summing all METs from each intensity. Participants were deemed eligible if they were considered inactive; a score below the following criteria deemed them eligible: a) "3 or more days of vigorous-intensity activity of at least 20 minutes per day **OR** b) 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day **OR** c) 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum total physical activity of at least 600 MET-minutes/week" (Forde, 2018). This scale further shows evidence of validity with moderate to high reliability (0.71-0.89; Dinger et al., 2006).

Readiness for Physical Activity

To assess whether it was safe for participants to participate in physical activity, the Physical Activity Readiness Questionnaire for Everyone (PARQ-+) was used in this study (Bredin et al., 2013; Jamnik et al., 2011). The PARQ-+ is a 17-item questionnaire that consisted of a range of questions that recognized potential physical activity constraints or limitations to participating in this behaviour. Participants responded either "Yes" or "No" to each item. If participants responded "No" to all seven items on this questionnaire, they were deemed unrestricted to engage in physical activity. A sample item included: "Has your doctor ever said that you have heart condition OR high blood pressure". If responses to the first seven questions include one or more "Yes'", then participants were prompted to complete the ePARmed-X+ which asked specific follow-up questions regarding their medical conditions (Bredin et al.,

2013). An example item from the ePARmed-X+ included: “Do you have arthritis, osteoporosis, or back problems?”. All responses that were a “No” to these items deemed participants ‘ready’ to participate in physical activity. If participants responded “Yes” to one or more of these, they were asked to see their physician for physical activity clearance. The PARQ-+ is effective in general populations and among those living with a chronic disease (Jamnik et al., 2011). Bredin and colleagues (2013) further report that the PARQ-+ is a valid measure of physical activity clearance.

Daily Minutes of MVPA

To objectively measure physical activity participants wore the hip worn ActiGraph GT3X+ accelerometer to measure their daily minutes of MVPA (John & Freedson, 2012). This was measured at all time-points: eligibility (baseline), intervention-end, 6-and 12-weeks follow-up. Specifically, this activity monitor recorded the volume and intensity of physical activity for each participant (Santos-Lozano et al., 2012), including the measurement of their accelerations in a standing, lying, or sitting position (John & Freedson, 2012). Participants wore the activity monitor during waking hours for a total of eight days, where MVPA was determined from the final seven days. Some researchers suggest using a 1-2-week washout period to minimize reactivity (i.e., engaging in more physical activity than normal; Motl et al., 2012). In contrast, other researchers recommend either a one-day washout period (Esliger et al., 2005) or no washout period at all (Davis & Loprinzi, 2016). With minimal literature on accelerometer reactivity in the adult population, a one-day washout period was employed to control for participant reactivity based on suggestions by Eslinger et al. (2005). Participants who were below 150 minutes of MVPA per week were eligible to participate in this study. For eligibility/baseline testing only, it was emphasized to participants that I wanted to confirm that

they are actually low on physical activity as indicated through their self-report; it is, therefore, important that they were to maintain their typical levels of physical activity while wearing the accelerometer.

I used Freedson cut points, which helped identify patterns of movement to determine the intensity levels of participant activity (Freedson, Melanson, & Sirard, 1998). Cut-offs determined by Freedson and colleagues (1998) included *light* (MET range of less than 3.00; less than 1952 counts per minute), *moderate* (MET range of 3.00 - 5.99; 1952 - 5724 counts per minute), *hard* (MET range of 6.00-8.99; 5725 - 9498 counts per minute), and *very hard* (MET range of > 8.99; greater than 9498 counts per minute). Non-wear periods of the activity monitor were described as a minimum of 60 minutes with zero activity counts, permitting up to two successive minutes with counts from 0 to 100 (Semanik et al., 2015). To ensure reliable evaluations of physical activity, participants were only included in the analysis if they had a minimum of 4 valid monitoring days with 10 hours or more of wear time (Troiano et al., 2008). Previous research supports the use of the ActiGraph GT3X+ accelerometer as it exhibits high intra-instrument reliability (Santos-Lozano et al., 2012), high inter-instrument reliability (Jarrett et al., 2015; Santos-Lozano et al., 2012), and is valid (Wetten et al., 2014). Physical activity has been commonly captured and quantified through the use of accelerometers (John & Freedson, 2012), which makes it a dependable measure.

In addition to wearing the accelerometer, participants also filled out a daily log (see Appendix C.4) which allowed them to record specific activities they engaged in over the week and the time they spent in all forms of MVPA. This log supplemented the accelerometry data because previous research reports that the context of some activities is not fully captured by the accelerometer (e.g., swimming, cycling; Dunlop et al., 2014; Semanik et al., 2015). This

information allowed us to determine whether the accelerometer captured all of the participant's MVPA and identified when participants started to wear their accelerometer for the day.

Secondary and Exploratory Outcome Measures

An important feature of feasibility studies is to have participants test out exactly what they would endure throughout the larger trial (Thabane et al., 2010). The measures listed in Table 2 were included for baseline/eligibility and the purposes of having participants complete the questionnaires that are intended to be encompassed in the larger efficacy trial and to allow us to assess means for both pre and post intervention of key variables. A full description of these measures can be found in Appendix E.

Procedure

General Overview

While the aim of the present study was to determine feasibility and acceptability indicators, the procedures of this intervention occurred as they were planned for the larger efficacy trial. The procedural phases of the intervention (see Figure 1) were employed after receiving approval from the Nursing and Education Ethics Review Board at the University of Manitoba. Interested participants completed an online eligibility questionnaire. Those who were eligible completed the second step of confirming their physical inactivity by wearing an accelerometer for 8 days. Eligible participants partook in the 6-week online intervention using 'Zoom' which included a first initial one-on-one meeting (session 1) followed by five, weekly online group sessions which were approximately 1.5-hours each in length. Participants were randomized into one of two groups: a self-compassion condition or a control condition. Randomization of participants should create equal conditions; differences in demographics, potential confound variables, and physical activity, should be equally distributed between both

conditions. Those in the self-compassion condition received 45-minutes of behaviour change information in which I refer to as ideal care and 45-minutes of self-compassion training in *sessions 2-6*. Participants in the control condition received the same 45-minutes of ideal care as in the self-compassion condition and 45-minutes of health information; this was included to ensure a balance of support and communication between groups (Kazdin, 1980). Group sessions are well-suited in community settings which were executed in this study as there is support for physical activity behaviour change (Cramp & Brawley, 2006) and self-compassion training (Sirois & Rowse, 2016) through group delivery. Final testing occurred at intervention-end and at 6-weeks and 12-weeks follow-up. For participants who agreed, acceptability of the intervention was assessed through virtual one-on-one semi-structured exit-interviews at intervention-end (Appendix G). For participants who did not want to partake in an interview, they were asked to respond to similar questions at intervention-end through an open-ended questionnaire using SurveyMonkey (Appendix G). See Figure 2 for the intervention timeline.

Recruitment

Recruitment of participants occurred through media coverage (e.g., University of Manitoba Today newsletter, CTV news, instagram, radio). Interested participants called or emailed a research assistant expressing their interest in the study. The research assistant then contacted interested participants and sent them the eligibility questionnaire.

Eligibility

Interested participants completed all eligibility measures through an online questionnaire. Insufficient physical activity levels were determined through a 2-step process. The eligibility questionnaire identified low scores on self-reported physical activity levels using the IPAQ (Forde, 2018). Those individuals scoring at 600 MET minutes a week or lower (Forde, 2018)

were asked to wear an accelerometer for 8 days (John & Freedson, 2012) to provide an objective measure of their physical activity. Participants who confirmed their low physical activity levels (i.e., below 150 minutes of MVPA) with the objective assessment (Tremblay et al., 2011) were deemed eligible to participate. Ultimately, physical activity levels determined at eligibility will also serve as an indicator of baseline physical activity for the future efficacy trial. All eligibility criteria can be seen in Table 1. To refer to eligibility measures, see Table 2 and Appendix C).

Consent and Baseline Assessments

Participants provided consent (see Appendix A) and completed the accelerometer testing requirements. After they were deemed eligible from the accelerometer data, they completed a baseline questionnaire which included demographic and covariate measures through an online link using SurveyMonkey. Alternative baseline assessment methods (paper and pencil through the mail) were available for those who preferred an alternative mode of assessment.

Randomization and Formation of Groups

Randomization was accomplished using an online electronic randomization sequence that generated a 1:1 allocation ratio. The randomization process was conducted by a research team member (i.e., statistician) from the University of Manitoba. This individual had statistical expertise and had no other involvement in the study. Participants were randomized to either the control or the self-compassion condition. The research coordinator communicated and sent identical emails to all participants (i.e., questionnaires, scheduling meetings, etc.) whereas study personnel (i.e. facilitators, research assistants) who interacted with participants (e.g., accelerometer drop-offs, one-on-one meetings and group sessions) were blinded to participant allocation.

Session 1: One-on-One Appointment

After baseline assessments were completed, participants engaged in an online meeting with a research assistant for their first session. Session 1 was identical for all participants and represented a portion of ideal care provided in this study. In this thesis, ideal care refers to care that represents best behaviour change practice according to research. Indeed, research shows that teaching people with prediabetes behaviour change skills can lead to increased physical activity (Bourne et al., 2019; Jung et al., 2015; Locke et al., 2018). Further, the CANRISK assessment tool is designed to determine T2D risk and to facilitate discussions about T2D risk between patients and professionals (Canadian Pharmacists Association, 2011). Therefore, as a form of ideal care, all participants met individually with a research assistant to discuss their T2D risk (determined by the CANRISK assessment tool). This meeting was considered ideal care because it was similar to what a patient diagnosed with prediabetes would ideally go through with a diabetes educator (Canadian Pharmacists Association, 2011). Research assistants were trained to conduct these one-on-one meetings by the principal investigator. In this individual meeting, the research assistant also advised participants to engage in 150 minutes of MVPA per week (Tremblay et al., 2011) and discussed the benefits of physical activity to reduce their T2D risk. Dependent on participants CANRISK responses about their nutrition and BMI, the research assistants also briefly discussed the benefits of nutrition and weight management (if the participant chose to hear about it) and provided additional resources. However, it is important to note that these topics were only momentarily discussed as they are not the focus of the larger efficacy study. The general outline of information delivered per condition is described below.

Behaviour Change Training

All participants received a second aspect of ideal care in the form of physical activity behaviour-change psychoeducation that is recommended for this population (Yudkin & Montori, 2014). The behaviour-change information was modelled off theory-based education materials used in previous physical activity interventions that have yielded significant changes in physical activity among people with prediabetes (e.g., Bourne et al., 2019; Jung et al., 2015; Locke et al., 2018). In sessions 2-6, participants learned the importance of goal-setting, self-monitoring, how to build self-efficacy, identifying and addressing barriers to physical activity (i.e., action and coping planning), finding ways to enjoy physical activity, and aligning physical activity with their values (i.e., relapse prevention).

Self-Compassion Condition

In addition to the behaviour change training (ideal care), participants in the self-compassion condition received self-compassion training. The self-compassion training was designed specifically for this study using guidelines by self-compassion experts, Neff and Germer (2013), which were adapted from their Mindful Self-Compassion training program. Participants in the self-compassion condition learned how to apply self-compassion to their prediabetes and physical activity struggles and experience through activities that have been effective at increasing self-compassion (Mosewich et al., 2013; Neff & Germer, 2013; Smeets et al., 2014). In sessions 2-6, participants learned about self-compassion and how it can help with behaviour change, including physical activity. They learned about the misconceptions of self-compassion and convincing research on how self-compassion can improve their health. Further, they learned about the active and passive components of self-compassion (Yin and Yang),

mindfulness, and letting go of resistance. Lastly, they learned about loving-kindness, self-compassionate motivation, dealing with difficult emotions and embracing the good.

Control Condition

Participants in this condition received behaviour change training (ideal care) and attention. Attention was in the form of educational information about health topics unrelated to physical activity. Specifically, participants learned about screen time, sleep, antibiotic use, benefits of water, and benefits of vitamin D. These topics were chosen because they were distinct from the self-compassion condition yet allowed us to expose control participants to the same amount of attention and same mode of delivery as the self-compassion condition. Specifically, the distribution of information, online group discussion, at-home activities and writing exercises (including quantity), and amount and features of attention (duration of the group session, online group interaction, exposure to instructor) were the same for both conditions. By balancing attention and activities across conditions, it allows us to rule out any effect that a type of activity or attention may have which will be relevant for the future efficacy trial (Freedland, 2013; Leary et al., 2007). Further, these topics were chosen as they may have elicited some interest and provided some benefit to participants, which is also a goal of attention control groups (Aycock et al., 2018).

Session Facilitators

There were two research assistants who facilitated the online, synchronous, weekly group sessions. Both facilitators (i.e., PhD student and post-doctoral fellow) had completed an 8-week self-compassion training course and had experience conducting behaviour change interventions. Both facilitators rehearsed and practiced delivering condition specific sessions with the principal investigator until the standard of delivery was met.

Participant Retention Efforts

To ensure that participants comply with the study sessions, a few strategies were employed to promote motivation and adherence based on the Information-Motivation-Strategy Model for health intervention among participants with chronic conditions (Dimatteo et al., 2012). To enhance adherence and remove barriers to physical activity (e.g., limited access to facilities), participants were provided with access to a website created specifically for this study which offered additional resources (i.e., free exercise tutorials, articles, podcasts, etc.). Additionally, participants were provided with flexible assessment times and text message communication. In working with a mobile app development company, we created a text-messaging system designed specifically for this study. Participants needed to provide consent to receive text messages. However, alternative versions of information and communication were also available (i.e., email, phone). The text-messaging system automatically sent out condition-specific messages. Specifically, messages were set up to remind participants about upcoming online sessions and to provide condition content and resources. Further, these messages asked participants whether they were planning to attend the upcoming online session and whether they completed their weekly home practice activities by responding "Yes" or "No". Examples of home practice activities for both groups included setting SMART goals, aligning physical activity with their values, and setting a long term goals. For participants in the control condition, home practice activities included tracking their sleep, water intake, and screen time. Participants in the self-compassion condition completed home practice activities such as writing to themselves as they would a friend and creating three soothing words. An example of a text message for participants in the self-compassion condition includes, "Hello! In your fourth session, you learned about action-coping planning and the practice of mindfulness". This use of a dedicated text messaging app

facilitated information sharing. Participants also received a $10.00 Amazon gift card for each questionnaire they completed and intervention session they attended; the goal of this compensation effort was to strengthen participants motivation to participate and achieve high retention of study participants.

Follow-up Assessments

At the end of the intervention, participants completed another set of questionnaires through an online link which included secondary outcome measures. They also were asked to wear an accelerometer for 8 days to assess their daily minutes of MVPA. Once completed, a research assistant picked up the accelerometer. At the 6-and 12-weeks follow-up mark, participants completed this same process. Once completed, participants were debriefed (see Appendix B).

Semi-structured exit-interviews and open-ended exit-questionnaires were conducted at intervention-end; this was the only time-point these interviews occurred, and they were unique to the feasibility and acceptability of this study. An interview guide for the exit-interviews was developed following “The Four-Phase Process to Interview Protocol Refinement” framework by Castillo-Montoya (2016). This framework includes four phases: (1) confirming your research questions relate to the exit-interview questions, (2) composing a balanced conversation between objectives of the study and topic discussion (i.e., develop protocol), (3) obtain protocol feedback, (4) simulate interview protocol in similar settings to the real study (Castillio-Montoya, 2016). By using this framework for conducting the exit-interviews, it warrants strong and enriched data quality for this thesis.

Statistical Analysis

To assess the primary feasibility outcomes of the intervention, descriptive statistics were used. To examine the acceptability of the intervention from the online exit-interviews and exit-questionnaires, I used a thematic analysis (Braun & Clarke, 2006). All exit-interviews were voice recorded and transcribed (Bengtsson, 2016); participants were offered the option to review and validate (i.e., member check; Creswell & Miller, 2000; Bengtsson, 2016) their interview if they chose to before using it as data. Responses from the open-ended exit-questionnaires were merged together with the exit-interviews. After all interviews were transcribed, accompanying categories and themes were created (Braun & Clarke, 2006; Vaismoradi et al., 2013). To explore secondary outcome measures while also adhering to the guidelines of a pilot and feasibility study (Sim, 2019), I reported means and standard deviations of key variables from pre- and post-intervention for both conditions (i.e., control and self-compassion) to assess the suitability of our measures for the future trial.

Results

The findings from this study allowed me to examine the feasibility of a planned efficacy trial (clinical trials #NCT04863235) as well as whether any key study components should be altered to maximize feasibility. The following feasibility results will be presented in the order of the model by Thabane and colleagues (2010). Please refer to Table 5 for the results compared with criteria.

Recruitment and Eligibility Screening

Recruitment took place between August 7th and September 30th, 2020. Our most successful recruitment strategy was through social media. The majority (51.72%) of participants heard about the study on Facebook, while others learned about it on the news (27.58%), radio

(6.89%), University web page (6.89%), Instagram (3.44%), or from some other source (3.44%; i.e., heard from family/friend). A total of 92 individuals expressed interest in this study (see Figure 1). Sixty-eight (73.91%) of these people were screened for eligibility either over the phone or through an online questionnaire; the remaining people did not respond to screening invitations. A total of 22 (23.91%) individuals met the eligibility criteria. Eighteen participants consented to take part in the intervention and were randomized. It took an average of 31 days for participants' eligibility to be determined. To recruit an adequate number of participants for a wave, it took 8-weeks which did not meet our feasibility criteria (i.e., recruiting 14-20 participants in one month).

The following information breaks down factors that made 46 people ineligible at different stages of the eligibility screening: 20 people were too physically active; 10 expressed they had either type 1 or 2 diabetes, 6 had incomplete data from the online questionnaire; 3 were both too active and too high on self-compassion; 2 were too high on self-compassion; 3 did not meet the age requirements; 1 did not have prediabetes; 1 did not use the internet.

Process Time

The average time it took participants to complete their eligibility questionnaire, the PARQ-+, and the 8 days of wearing an accelerometer was 24.67 days or just over 3 weeks. The process time calculated was slightly over our criterion of 2-3 weeks.

Retention Rates

One-on-one meetings (session 1) took place between September 9 – October 10th ; the remaining weekly group intervention sessions (sessions 2-6) occured from October 13th – November 10th, 2020. The 6- and 12-week follow-up assessments occurred the weeks of

December 16th – 23rd,[2] and February 3-10th, 2020, respectively. Participants partook in exit-interviews between November 13th – November 26th. Of the 18 participants (9 in each condition) at the start of the study, two participants (one from each condition), dropped out by the end of the intervention leaving 16 participants at intervention-end (11.11% drop-out rate due to withdrawal); this corresponds with our criteria of 15-20% which followed guidelines from previous studies (Biber & Ellis, 2019; Small Steps for Big Changes, 2014). The participant in the intervention condition dropped out after the first session because of personal reasons while the participant in the control condition dropped out because their computer broke and they lost access to internet. Only one participant of 16 did not complete the 6-and 12-week follow-up questionnaire yielding a 8.3% dropout rate at follow-up; this met our criteria which was set at 10%. One participant (intervention condition) did not complete baseline measures but remained in the study and completed all follow-up assessments.

Compliance/Adherence Rates

With only one participant missing one session, overall attendance to the intervention was high (98.93%) and exceeded our criterion of 80%. We assessed home practice adherence by asking participants via text whether they had completed the practices for that week (yes/no) and, if yes, what percentage they completed. Of participants who responded (80.25%), 69.14% reported that they had engaged in their at-home practice which fell below our criterion of 80%. Further, participants reported an average score of 7.06/10 (70.6%) in terms of how much of their home-practice they completed (0 = none; 10 = all); this was under our 80% criterion. Lastly, we assessed adherence to wearing the accelerometer. We calculated the ratios of participants with

[2] We conducted our follow-up assessment at 5 weeks post-intervention instead of 6 weeks (as planned) given that 6 weeks post-intervention week fell over Christmas (December 25th) when people's schedules were likely to be impacted by the holiday.

acceptable accelerometer wear time (i.e. four days with at least 10 hours each day) to the total number of participants at each time-point[3]. Adherence was 100% at baseline and at the 12-week follow-up whereas adherence was 84.62% at the 6-week follow-up. Adherence to the minimum accelerometer wear time surpassed our 80% criterion.

Instructor Fidelity

The principal investigator evaluated 22% (i.e., four; two for each research assistant) of the one-on-one meetings and rated both research assistants on how well they conducted their session. All sessions were rated highly for fidelity and quality (Mean = 4.83). Both research assistants met our criterion (average overall assessment score of four or higher)

The principal investigator also evaluated two group sessions (20%), one for each facilitator. Both facilitators received a total average score of 4.5 which met our criterion. To assess adherence to intervention topics, the facilitators filled out the "Facilitator checklist" after each group session (sessions 2-6). Both facilitators reported that they covered 100% of the prepared content/topics that they were supposed to cover in each session which exceeded our criterion of 90-95%.

Capacity

To determine capacity, all research assistants kept track of their hours. Of the research assistants who dropped off and picked up accelerometers, a total of 70 hours was used throughout the study. It also took approximately 4-5 hours per week for one research assistant to send out texts, emails, and make phone calls. It took research assistants a total of 20.5 hours to conduct all one-on-one sessions. On average, it took facilitators approximately three hours each

[3] There were three participants who lived out of town and did not wear an accelerometer.

to prepare and conduct the weekly group sessions. The number of hours to complete study tasks compared to the budget of our study was acceptable.

Study Personnel Challenges/Insight

To understand insights and challenges experienced by the session facilitators, we conducted semi-structured exit-interviews with them. Both facilitators articulated that group participation varied; Facilitator 1 (control condition) expressed that for certain activities "people would jump in and sometimes even talk to each other" whereas for other activities (e.g., sharing their worbook responses), "they were usually more silent after that". According to Facilitator 2 (intervention condition), some participants were more vocal than others: "there were probably two or three people who were also very vocal the entire time… but then, there were a couple other people who were quieter". Despite varying participation rates, class discussions were meaningful: "people were really engaged – I think there were good connections made to things that were relevant to them" (Facilitator 1) and "there was a lot of room for discussion" (Facilitator 2). Both facilitators expressed the importance of these rich discussions and suggested an increase in session length to enable more time for discussion and in-class activities. Although Facilitator 1 felt the timing of the control sessions went well, she did express that the behaviour change material was too long and requires amendments. Both facilitators perceived that participants enjoyed and were open to the session topics. However, they each commented on a topic that was challenging. Facilitator 1 indicated that the topic on 'antibiotic resistance' may have been too controversial and triggering for participants. Specifically, she mentioned, "there were a few instances…the antibiotics one, where it almost felt like it was getting a little opinionated". This topic was not well received and needs addressing. Further, the topic about 'exercise enjoyment' was not well received by some participants conveyed by Facilitator 2 as she

stated, “it was interesting because some people… were like, ‘I’m never going to enjoy exercise, I don’t want to use that terminology’”. It is imperative to recognize that exercise may not be enjoyable for some people. Therefore, our language/terminology when discussing this topic should be addressed. Despite some of these challenges, both facilitators felt that sessions went well and had minor suggestions that will be considered for a larger trial.

Safety

Of the participants who completed the exit-interview and the exit-questionnaire (online), the general consensus was that participants felt comfortable throughout all intervention sessions. Many participants agreed that the facilitators were very welcoming and supportive which made them feel safe and content in the group environment. For example, participant #69 stated, “It was kind of nice to be able to be comfortable in your own environment and knowing that [the facilitator] was in her own environment. It didn’t feel like someone lecturing…So, that really helped make it feel comfortable”. Other participants indicated that the configuration of the group setting made them feel comfortable: “It was just the ease of the whole, the overall kind of structure of the meeting, the way it flowed. It was easy to listen to, it was easy to participate in, to talk. I don’t think I ever felt uncomfortable with the group” (Participant #75). This met our criterion of 100% safety.

Acceptability

Findings from exit-interviews and exit-questionnaires at intervention-end insinuate that this 6-week physical activity intervention among people with prediabetes was acceptable with some minor changes to be addressed. Out of 14 participants, only one chose to respond to the open-ended exit-interview questions through an online questionnaire. Our analysis revealled 3

overarching themes: (1) positive experiences, (2) acceptibility of study aspects and (3) new additions to the study.

Positive Experiences

Group Interaction/Common Humanity. Participants indicated several positive qualities of the study: group interaction/common humanity, changed perspectives and understanding, and changed behaviour. A common sentiment expressed by participants was their appreciation for being in the study with people who were experiencing similar challenges. Specifically, one participant expressed:

"So, I think one big benefit was the human aspect, right? So, listening to other people saying, 'I didn't have a good week' or 'I had all these plans for this week, but they kind of fell through'. So, kind of just the reminder that you know you're human and you don't have to beat yourself up, you just have to say 'okay well that didn't work, I'm going to try harder next week…kind of looking at the human aspect of it all" (Participant #3).

For participants in both conditions, there was a sense of connectedness in their struggles. For example, a participant stated, "To know that other people are having the same difficulties makes you not feel like you're so alone in dealing with it" (Participant #11). Another participant also indicated a similar thought as they stated, "Knowing that you're not alone too actually helps a lot too because sometimes when we struggle with our health we think 'it's all my fault. I'm all alone'. But then when you talk to the people, you realize, these are people who come from all walks of life. You're not alone" (Participant #69). Statements such as these, commonly expressed by participants elucidate the shared struggle and common humanity that participants regarded as a positive experience of their participation in the study.

Changed Perspective and Understandings. Participants underlined that their viewpoints and understanding changed regarding their outlook and in dealing with physical activity barriers. For one participant, this changed outlook manifested in the realization that they can control their situation, "Really, I'm in control of this, and I can do this. I can change these things and I can do this. Whereas prior to that, it was more a matter of, well I was looking more at the obstacles and the challenges instead of looking at, again, if I can do this small change, I can do this small change, I can do this small change; I have these four small things and now I have a big change" (Participant #11). For another participant, they noted a changed perspective on how they viewed set-backs not through a failure lens but with hope: "You have to change your mentality, thinking and all that. So that part I learned from the group session; the workbook. It's okay to have some days that, okay it's not working out today, maybe I'll try again tomorrow. You're not a failure" (Participant #27).

Many participants expressed yet another perspective change, that of their outlook on physical activity as it relates to health. For example, one participant expressed: "Maybe not thinking of it as exercise so much but that I'm moving more and I'm going to do my best to prevent diabetes from taking a hold of my health" (Participant #80). Participant #16 stated that the material they learned was, "A reminder and reinforcement of how important it is to exercise. What it does for the mind, the body, the spirit". Many participants also emphasized a change in perspective as they recognized small amounts of exercise can be beneficial to their health: "Just recognizing and knowing that even short bouts of exercise can make a difference... that really helped to motivate me to go 'ok you know what. No more excuses!'" (Participant #80). Clearly, participants benefited from the intervention in terms of their development of changed

perspectives on their efforts to change physical activity and physical activity's relationship with health and well-being.

Changed Behaviour. The third sub-theme that emerged as a positive experience was participants' self-reported behaviour change. Not surprisingly for this physical activity intervention, many participants reported becoming more active, as reflected in statements like, "I started moving!" (Participant #80). Importantly, this same participant noted the benefit of their changed behaviour; "And recognizing that by moving, I actually feel better!" (Participant #80). Similarly, another participant stated, "I finally started going to the gym that I had signed [up] for months ago. And for the first time ever in my life, I'm 63, and for the first time ever in my life, because I've joined many gyms and I actually started to enjoy it!" (Participant #53). Not all participants reported increased physical activity, but noted engaging in other healthy behaviours that they viewed as small steps in the right direction as one participant noted having less sedentary time: "I haven't been spending as much time sitting in front of the tv during the day. I'm actually making more fresh meals and doing more things and spending more time outside – things like that. So, I might not be moving as fast and making huge leaps, but I feel like those are the steps that we need to get to where we're going" (Participant #69). Finally, changed behaviour took the form of improvements in how some participants treated themselves: "Well, I think being more mindful for myself and kinder to myself" (Participant #75). Taken together, a positive experience that many participants took from this study was noticeable behaviour changes that should contribute to their health and well-being.

Acceptability of Study Aspects

Themes based on acceptability of the intervention also emerged. Specifically, the receptiveness to the self-compassion and control material (i.e., intervention content),

receptiveness to the structure and format of sessions (e.g., instructors, group number, group length, online format), and the receptiveness to the components included in the intervention (e.g., wearing accelerometers, website, texts, questionnaires).

Receptiveness to Self-Compassion and Control Material. In general the response to the intervention and control material was positive. Participants in both conditions enjoyed the behaviour change content including learning about goal setting, "I think for me, it was almost the first or second week where we made some goals for ourselves and saw what the barriers were. I think actually sitting down and writing those things down had a huge impact" (Participant #69). Correspondingly, other participants expressed how "the whole idea of smart goal, is really a useful idea" (participant #50) and that "the goal setting was probably the most important. Because if you have no plan, basically you're planning to fail" (Participant #11). Participants appreciated the goal setting topic so much that they conveyed a need for more information: "Even if you did two sessions on that [referring to goal-setting] and kind of expanded on it more so that people could really sit down and do some serious planning with it" (Participant #11). This feedback from participants suggests that participants enjoyed setting goals and recognized its benefits for becoming more physically active.

Participants in the self-compassion condition expressed a recognition of self-compassion's value yet also expressed that the construct was difficult to implement. This appreciation was expressed through comments such as: "I think the whole concept of self-compassion, not being so hard on yourself or so judgemental, is a useful one" (Participant #50). This was reverberated by another participant as they stated, "Well I liked them all [topics]. But the most was probably around the actual talking to yourself like you would talk to a friend and the meditation" (Participant #75). One participant's comment demonstrates some of the

challenges participants experienced with implementing self-compassion: “Like the one where you have to soothe yourself and all that. Like I’ve never done that. Ever. So, I found that sort of awkward, but I can see the value in doing that” (Participant #66). Another participant expressed their hesitation to use self-compassion: “The age group of people that you’re looking at right now…a lot were Baby Boomers and Baby Boomers weren’t raised with self-compassion, so it was a very difficult topic… but I did learn a lot about it and learned from it” (Participant #3). These statements reflect that participants saw value in self-compassion despite it being a challenging to implement at times.

Control topics that participants enjoyed included ‘water’: “I was pleased to see the one with the water” (Participant #11) and ‘screen time’: “Yeah the screen time was important to me” (Participant #53). As articulated by Facilitator 1, some participants in the control condition did not resonate with the topic of ‘antibiotic resistance’. Specifically, a participant communicated: “The issue about antibiotic resistance, I wasn’t uncomfortable, but it was like ‘hmm, I should check and just see what is’” (participant #58). Although some participants in the control condition were familiar with some of the session material, they found it a good reminder and it was generally very well received. To attest to this, one participant in the control condition mentioned, “I enjoyed all of them [topics]. I have a particular interest in this kind of thing, so I was quite familiar with a lot of the material, but it was really good to refresh and there were aspects of the presentations that I was not aware were specifically helpful for people with prediabetes or even diabetes” (Participant #94). Another particpant also commented saying, “For some of the things [topics], I found for me to be common sense…there wasn’t one in particular that was like ‘oh okay this is pointless’…they definitely all tied in together” (Participant #69). In general, participants appeared to enjoy the control content and felt these topics were important.

Receptiveness to Structure and Format. Overall, participants thought the structure and format of the online sessions were good: “I thought it was well-structured, it was very well organized, and very informative. I liked how the different sessions were broken down by specific categories” (Participant #11). When referring to the length and time of individual sessions, participants responded positively, emphasizing that sessions went by quickly. For example, one participant stated, “Again, I enjoyed them [sessions], so to me they went fast” (Participant #53). Whereas another participant mentioned, “I thought the timing was perfect for me…and I thought the length was good” (Participant #11). A few participants expressed that the first two sessions were too long and preferred we stick to the allotted time: “The first few sessions they ran long. Like they were supposed to be over by 7:30 and I think they went till 10 to 8. So, I kind of didn’t like that” (Participant #66). The number of online group sessions was also well received by participants. One exemplar of this is when a participant declared, “I think it was a nice number. It wouldn’t have hurt if there were a couple more but I think it was alright” (Participant #53). Though the number of sessions and session length was well received, a large consensus of participants said they would have preferred more sessions: “I would have spread the individual sessions out to 8 or 10 weeks rather than having just 6” (Participant #94). This was reiterated by Participant #27, “I wish there were more [sessions]”.

Participants also expressed favorable responses about session facilitators: “It genuinely felt like someone [the facilitator] who wanted to help the group, so, that really helped make it feel comfortable” (Participant #69). Another participant shared that “she did a really good job of addressing people by their first names and also remembering things that were talked about in past sessions, which is always nice. So that made you kind of feel that you’re getting a more intimate setting with the group and people coming through, and a lot of positive remarks”

(Participant #3). According to yet another participant, the facilitator did a "great job at presenting the material, keeping them on track, answering questions, super positive" (Participant #80).

While some participants would have preferred in-person meetings, everyone responded positively to the online format: "I just prefer in person because I think you bond even better with the group when it's in person. But I could see that some people would prefer doing it over the computer" (Participant #66). Others saw the convenience of participating from their own home and preferred the online sessions, "I enjoyed the Zoom… I almost prefer the Zoom because it's coming home to me and not having to worry where are we meeting, is it dark out, is there a safety issue when I go to leave the meeting because now it's getting dark" (Participant #3). Similarly, another participant stated, "I can do this at home [online], so I liked that, I still got to interact with the group and so that was good" (Participant #8). Further, participants also highlighted the benefit of not having to commute anywhere and being more comfortable by being anonymous with the study in an online format.

Receptiveness to Intervention Components. There were several different components included as part of our intervention: text messages, website, home practice, workbook, accelerometers, and questionnaires. Participants provided assurance that these components were valuable and tolerable. The website was well received, though, many participants expressed that they did not use the website as often as they desired except for some regular users. Specifically, one participant stated, "When I went there [website], I was impressed with the information that was there" (Participant #58).

Most participants enjoyed the workbook activities even though some had difficulty completing the home practice. Participants particularly liked having a tangible book that they could refer to for additional information and to take time to plan their goals. For example, "[It

was] nice to stop my day and spend dedicated time to think about how to goal set or how much water to drink, how I can wind down my days so I can have a better sleep" (Participant #69). Another participant expressed, "The class is no longer available, but I still have information, I still have access to, I can still go back and take a look at, or just go back" (Participant #11).

Participants reported no complications with completing questionnaires and wearing accelerometers and expressed that these components were not burdensome. Specifically, the questionnaire was said to be "Very straightforward. The language was clear. There was no issues at all in filling it out" (Participant #11). Further, the length of the questionnaire was acceptable: "I thought it was fine. Because I was expecting longer… I had no problem with it. Like it was easy for me" (Participant #75). As for the accelerometers, participants had no difficulties wearing the device and felt it was comfortable: "I'm comfortable with [it], [it was] no problem at all" (Participant #27). Most participants agreed that the boxes for the accelerometer tracking sheet could be larger: "It was so tiny! The area to fill out… Not that I have a lot to fill out but there was hardly any room" (Participant #16). This was also reiterated by participant #3 who stated: "I think I'd like the boxes a little bit bigger".

During the exit interviews, participants stated they liked having the reminder through text messages and felt it helped keep them on track: "I loved the texting and messages. I thought they were great to keep me focused and reminded" (Participant #75). Participants also felt as if they were not overloaded with texts but instead it was perceived as "a gentle nudge!" (Participant #16) and "a good reminder because if you were getting busy with other things it would just remind you, so it wasn't too many texts. I thought it was the right amount" (Participant #66).

New Additions to the Study

As articulated previously, all participants stated their enjoyment in the intervention and how methodical it was. Though, some participants offered us new ideas that could be applied to our study, supplementing what is already included. Some participants expressed interest in forming closer bonds with their group members: “I think that having a Facebook group or some sort of ongoing involvement with one another, breakout groups, or things during the session would have been helpful. Just to get to know the other participants a bit better” (Participant #94). Other participants identified that it would be useful to include more specific physical activity recommendations, “More concrete recommendations…So you know to do so much resistance, for certain muscle types, muscle groups in the body” (Participant #58) and example videos, “Even showing videos of, like inspirational videos of older people, like the progression you know? The first day they started, 30 days in. Just showing a snippet of that too, and then the types of exercises they’re doing” (Participant #66).

Some participants mentioned that our study was different than they expected. Many thought there was going to be a physical activity component to the intervention. This led to another suggestion for change: “The only thing I can think of is like actually doing an exercise class together. I think doing that together would be really nice” (Participant #66). Similar thoughts were insinuated by Participant #16: “I think participating in an exercise program with everybody and having people help you and monitor you. Guidance would be really good”.

Further, some participants provided a few suggestions for better design; it was revealed that the PowerPoint slides at the back of the workbook could be enlarged. Some participants stated that they needed more time to complete workbook activities during class: “The class activities were very useful. I found that we didn’t have enough time to complete them in a

thoughtful manner" (Participant #94). Another addition to the workbook was suggested. Particularly, it was mentioned that a journal portion embedded in the workbook would be beneficial. For example, "It might have even been good to have almost like a journal kind of section, or a reflection on how your week went kind of thing as part of the homework [workbook] as well" (Participant #75).

Secondary and Exploratory Results

Pre- and post-intervention means and standard deviations of key variables for the larger efficacy trial are included in Table 4. To evaluate the suitability of key variables to be included in the larger trial, the means from baseline assessment were evaluated for participant interpretation and ceiling effects, appropriate range of measures etc. (El-Katob & Giangregorio, 2018); there were no ceiling effects detected. Out of all key efficacy variables, it was detected that some participants had difficulties with the interpretation of the physical activity self-report questionnaire at the follow-up time-points. Specifically, we noticed that participants scored outside of the range of the self-report physical activity questionnaire for one of the items (i.e., IPAQ). After further examination, we recognized that this questionnaire was incorrectly worded: The IPAQ in the present study was worded "During the last 7 days, how many *bouts*…" whereas the correct wording should have been: "During the last 7 days, on how many *days*…". This explains participant difficulty with this measure and the wording will be corrected for the larger trial. Mean substitution was used for missing data; only one data point was missing for each time-point.

Discussion

The present mixed-methods study examines the feasibility and acceptability of an efficacy trial which aims to increase physical activity among people with prediabetes. This

examination is imperative to ensure the research team and participants can achieve and maintain the demands of the planned intervention on a larger scale (Lancaster et al., 2004). The data suggest that the larger efficacy trial should be feasible and acceptable and support the development of the larger study. Throughout this examination, I uncovered some feasibility and acceptability components that need to be improved and others that can be enhanced; this information offers guidance for the refinement and improvement of the larger efficacy trial (Thabane et al., 2010).

Feasibility

Recruitment and Process time

Some feasibility issues had to do with group formation. We aimed to recruit 14-20 participants per month, based on the recruitment rate observed in the Small Steps for Big Changes study (Jung et al., 2015) which also required participants as community members with prediabetes. However, we required almost twice this time to recruit our minimum (14) and maximum (20) number of participants. A few factors may have led to our slower recruitment. First, we had additional eligibility criteria relative to Small Steps for Big Changes including a score below the mean on the self-compassion scale (Neff & Tóth-Király, in press) which accounted for approximately 11% of our ineligible participants. Further, our study and Small Steps for Big Changes took place in different Canadian regions; there may be regional differences that affect recruitment. However, the location of the present study (i.e., Manitoba) has a large number (28% or 403,000) of people living with diabetes and prediabetes (Diabetes Canada, 2019); we are confident that we can draw a sufficient number of eligible people from this large pool.

Our teams slow recruitment rate was affected by our failure to meet another feasibility criterion: length of time to complete eligibility steps (i.e., process time). A factor that likely contributed to our longer process time than observed in Small Steps for Big Changes (Jung et al., 2015) was our decision to confirm self-reported physical activity through accelerometry which required participants to wear an accelerometer for eight days. To accommodate the longer process time, we will extend our previously allotted 4 weeks of process time to 7-8 weeks to allow us to recruit sufficient participants for a given wave. We will also ask participants to provide two methods of contact information (email and phone number). Some of our emails to participants were sent to 'junk mail' which delayed process time (and possibly lowered our recruitment rate). Further, we will emphasize the importance of participants responding to study requirements in a timely and efficient manner. We anticipate these adjustments will make recruitment and process time feasible in our planned efficacy trial.

Our team observed an eligibility rate of 24%; we must recruit nearly 70-90 people to ensure we meet our adequate number of 14-20 participants for each wave. Reflection upon our recruitment channels provides information to help us maximize our recruitment success. The most successful strategies were through social media posts on Facebook and in-person interviews broadcasted on T.V. news. Other media sources led to recruitment though on a smaller scale than social and traditional media. We will continue to use all recruitment avenues for the larger trial, however social and traditional media coverage will be prioritized. Specifically, we will work with our faculty communications person to find traditional (T.V.; radio) media coverage opportunities. Further, we can increase the frequency of our social media exposure, which is allowable within our advertising budget.

Finally, a small change will be implemented based on what made people ineligible to participate. The most common reason people were ineligible was because they were either too physically active or had already been diagnosed with type 1 or T2D. We will ensure to put forth greater emphasis on these exclusion criteria in our advertisements for the future efficacy trial. By doing so, we anticipate this will help increase our eligibility rate of those individuals who express interest in the study.

Retention

Participant retention was strong throughout the intervention and all follow-up time-points; we achieved retention rates that fell within the scope of our predetermined criteria. Enhancing our retention efforts by including resources (i.e., website) and alternative communicative arrangements (i.e., text messages) may have motivated participants to adhere to and participate in this study which aligns with strategies suggested by Dimatteo and colleagues (2012). Further, compensation with a $10.00 Amazon gift card after each completed testing and intervention session may have also contributed to participant preservation (Brueton et al., 2017). This insinuates that it is, in fact, feasible to retain most participants as they move through the intervention, follow-up assessments and complete study components. The research team will continue with similar retention strategies (i.e., resources, compensation, multiple communication formats) for the future trial to maintain participant retention.

Compliance/Adherence

A third feasibility outcome that did not meet our criteria was adherence to home practice activities. Although participant adherence to other study aspects was high (i.e., attendance to intervention sessions), the number of participants who reported that they engaged in home practice and, among those reporting, completion rates for home practice both fell slightly below

(10% below) our criterion of 80%. To bring these adherence rates up to desirable levels for the planned efficacy trial, we will remind participants of the importance of i) responding to text messages about home practice for the purpose of study outcomes, and ii) completing home practice for their personal benefit. We plan to remind participants of this at the end of each session. Further, we will adjust group sessions slightly to incorporate a brief discussion about the last week's home practice at the start of each session; this should increase participant accountability for home practice and hopefully, in turn, adherence to this study aspect.

High attendance was observed across the 6 sessions, for both the control and self-compassion group. Seeing as it can be a challenge to have strong adherence and retention among participants in control groups (El-Kotob & Giangregorio, 2018), a strength of this study is the high retention and adherence in the control group. Participants in both groups expressed their enjoyment for all sessions and acknowledged the value of them which may have helped with retention. The two participants who dropped-out of the study did so for reasons that were out of our control (e.g., loss of access to a computer), however, it is important to acknowledge that some drop-out is unavoidable and likely to occur. Lastly, we observed strong adherence (over 84%) to wearing an accelerometer for 8 days at the four different time-points. This met our predetermined criteria which is important for the planned trial as physical activity will be a main study outcome; this also exhibits that participant's generally understood instructions and felt that the accelerometers were not overly burdensome to wear.

Instructor fidelity

In harmony with our planned protocol, both facilitators delivered all intervention components as intended. Specifically, both facilitators reported that they covered all intervention topics/content for each session. However, to avoid cutting content, facilitators noted that they

allowed two of the six sessions to go longer than planned (for both groups). During exit-interviews, some participants expressed their dissatisfaction when the sessions went overtime. To avoid this occurrence in the future efficacy trial, our team will extend the session length from 1.5 hours to 2 hours. During exit-interviews, most participants expressed that they would have preferred sessions to be longer. Therefore, this extension in session length for the planned trial appears to be a satisfactory modification. Facilitators also reported minor technical difficulties during group sessions (e.g., difficulty screen sharing, sound/microphone complications). However, these issues were resolved in a timely manner and did not significantly interfere with the group session; some technical/systematic trouble is likely to occur and unavoidable when conducting online studies. The principal investigator also assessed adherence to the planned intervention which also included an examination of how well facilitators presented session content and their communication skills. The principal investigator reported that the facilitators adhered to the planned procedure and had exceptional presentation and communication skills which was compliant with our criterion. This was further echoed by participants as they conveyed that both the facilitators had exceptional communication skills which made them feel comfortable, safe, and supported during group sessions.

Capacity

The final feasibility outcome that we assessed was the overall capacity of the intervention. After assessing the total number of hours it took study personnel to complete all study tasks, we established that we were able to stay within the confines of our study budget. Though the number of hours required to complete study tasks among study personnel may vary, we plan to stick within similar hours devoted to study tasks for the planned efficacy trial; we anticipate that this will continue to align within the parameters of our planned budget.

Acceptability

Positive Experiences

Overall, perceptions by both participants and facilitators conveyed that this study was acceptable. Participants indicated a consensus of enjoyment and gratitude towards being part of this study. Regardless of which group participants were in, they all revealed a sense of group connectedness through their shared experiences of having prediabetes while increasing their physical activity. Participants further expanded their viewpoints by displaying a more positive mindset as they spoke about their control and confidence over their physical activity engagement. Not only did participants acknowledge the benefits of becoming more physically active, but they expressed actual increases in their physical activity and decreases in their sedentary behaviour. Participants' positive experiences validates the study's acceptability, and we speculate that it may also have contributed to the high adherence rates throughout the study.

Acceptability of Study Aspects

When conducting interviews with both facilitators and participants, we gathered valuable insight about the group sessions which gauged receptiveness to the study content. Both groups expressed that they accepted and appreciated the behaviour change information. Participants in the self-compassion group reported experiencing some challenges when applying self-compassion but also acknowledge the skill's importance and value. This finding is not unexpected given that other feasibility studies found that the concept of self-compassion was accepted (Boggiss et al., 2020; Brooker et al., 2020). Further, participants in the control group found study content to be enjoyable; study topics were familiar yet a nice reminder in which they benefited from.

Though most intervention content was acceptable, some topics could be altered or substituted. Specifically, both participants and facilitators expressed concerns related to the topic of 'exercise enjoyment' and 'antibiotic resistance'. We included strategies on how to make exercise more enjoyable for participants (e.g., listening to a podcast or exercising with a friend). Despite the provision of these strategies, it can still be challenging for some people to find joy in exercising; we will acknowledge this to participants who are struggling with exercise enjoyment. Second, we plan to replace the topic of 'antibiotic resistance' altogether. Instead, we will include an appropriate control topic related to health (e.g., blood pressure or health myths).

The present study was originally planned to be an in-person intervention. However, restrictions related to Covid-19 did not allow us to proceed with this form of delivery; assessing participants' acceptance of the online format was therefore an important outcome. Participants indicated that the online format was acceptable. In particular, participants noted the convenience of participating online. Given that online self-compassion interventions have been shown to be acceptable and feasible (Campo et al., 2017), we were not surprised to have a similar result. Though, some participants communicated a preference of being in-person, all participants agreed that the online delivery had several benefits.

Both facilitators and participants expressed the desire for more sessions and/or longer session duration. To fulfill this request, we plan to increase the number of sessions from six to eight and will expand the duration of class sessions from 1.5 to 2 hours for the larger efficacy trial. Not only will this provide more time to recruit participants for the next wave, but it will also allow participants to have more time during class sessions to complete their workbook activities and will allow for enhanced group discussion.

Participant receptiveness to the intervention components was regarded as acceptable. While the rate of adherence to home practice activities in the workbook was lower than we would have liked, participants acknowledged that the activities within the workbook were easy to understand, with most agreeing that they enjoyed the activities and found that the amount of requested engagement was not onerous. This finding demonstrates strong acceptability of the intervention component of home practice and class activities in the workbook.

Other intervention components such as text messages and questionnaires were acceptable. Most participants had acceptable accelerometer wear-time which resonates with their response about how they tolerated wearing the accelerometer. However, participants did report that the boxes for the tracking sheet could be enlarged which we plan to adjust in the larger efficacy trial. Further, participants highlighted their appreciation toward the study website which was specifically designed for each group, offering tailored information and resources. However, it was observed that most participants underused this resource. Though this was not a formal component of the intervention (rather a supportive and optional resource), it would be ideal if participants had more engagement and increased access to the website. Therefore, we will remind participants about this resource each week during the sessions and highlight related website content. The planned efficacy trial will continue to utilize these components.

Considering New Additions to the Study

In receiving participant feedback, we were open to suggestions that would improve the planned efficacy trial in addition to addressing feasibility issues. First, participants acknowledged the benefits of forming a Facebook group to have communication with other group members as a form of accountability, motivation, and support. Although we see the value in this suggestion, we cannot offer nor manage such a group as part of the intervention for ethical

reasons. However, we acknowledge that it is out of our control if this is brought up during a session (nor do we oppose it). Therefore, for the future efficacy trial, we plan to tell participants (if the topic arises) that they are welcome to create their own Facebook group on their own initiative; we will not formally encourage this or be involved.

Participants also offered minor suggestions for changes regarding the design of the workbook. We plan to integrate these suggestions in the workbook for the larger trial: we will increase the font size of the PowerPoint slides and we will include a section where participants can record notes and reflect after each session.

Another recommendation that was made included that the intervention contain inspirational videos. We plan to incorporate this suggestion and we have interviewed a participant from the present feasibility study who successfully became more physically active. Specifically, we asked this participant to discuss some of the changes they have made regarding their physical activity engagement as they progressed through the study. We anticipate that participants in the efficacy trial will be able to relate to this individual and perhaps help increase their motivation.

Lastly, participants communicated that a physical activity component would be enjoyable. We will not add a physical activity component as requested; it is challenging to find activities that everyone can enjoy and work into their schedules. Further it would be difficult to implement in-person activities due to the ongoing Covid-19 restrictions. However, we plan to include more physical activity information as advised by participants for the larger trial. Specifically, more information about physical activity recommendations and its advantages will be integrated within the first one-on-one meeting. By increasing the length of each session to 2 hours, it will allow research assistants with more time to identify participants relationship with physical

activity and to offer assistance as they help participants set realistic, attainable goals for short and long-term physical activity engagement.

Secondary and Exploratory Reflection

An important aspect of this pilot and feasibility trial was to have participants complete all components (including all study questionnaires) planned for the full-scale trial as per recommendations (Thabane et al., 2010). We further reported the pre- and post-intervention means and standard deviations of key variables. The examination of this data allowed us to assess the suitability of our measures for the future trial, such as allowing us to determine ceiling effects or issues with measures. One measure yielded scores outside of its range at the follow-up time-points which was the self-report physical activity measure. We examined why participants had difficulties with this measure and realized the scale was incorrectly worded. In the future efficacy trial, we will ensure that this scale is modified to the correct wording.

Further, it is important to note that feasibility studies are not intended to examine group differences or change (Thabane et al, 2010). Indeed, Sim (2019) acknowledged that conscientious researchers may feel compelled to examine their data to get a sense of what they may expect in terms of study outcomes to be examined in the larger trial. Yet Sim (2019) cautions against such speculation on the basis that pilot and feasibility studies are not properly powered to draw conclusions about change or group differences; doing so may lead to inappropriate decisions as no evidence of an effect in a pilot study is not evidence of no effect but rather simply inconclusive information (Thabane, 2010). This literature informed our decision to withhold from comparing groups for differences or examining pre-to-post changes of our study variables. We acknowledge that as a feasibility study, an examination of this nature would be disingenuous and premature given our small sample size.

Strengths

This study offers many notable strengths. First, my research represents an important preliminary step (Abbott, 2014) that will set up our research group to test an intervention that, to my knowledge, will be the first to examine whether self-compassion can augment usual behaviour change skill training. Pilot and feasibility studies are a fundamental and necessary step prior to a larger efficacy trial to ensure that the main study aspects, research money and intervention efforts are successful; making it less likely for unexpected challenges to hinder results (El-Kotob & Giangregorio, 2018; Vogel, 2017). Past research studies have noted that self-compassion interventions are, in fact, feasible and acceptable (Boggiss et al., 2020), including those among chronic populations (e.g., cancer) in online formats (Campo et al., 2017). However, to my knowledge, the present study is the first to investigate whether this specific online self-compassion intervention is feasible and acceptable among a different chronic population: people with prediabetes. The preliminary steps taken in this thesis provides assurance that the planned efficacy trial will be of high quality and should be feasible (El-Kotob & Giangregorio, 2018).

Further, the design of this pilot study was conducted in accordance with recommendations by Thabane and colleagues (2010) which was another asset. Specifically, this study took the appropriate steps to ensure its emphasis was on providing clear feasibility objectives and analytic plans while specifying set feasibility criteria and avoiding an unsuitable assessment on statistical significance; many researchers fail to adhere to these guidelines (Thabane et al., 2010) and misuse pilot studies altogether (Lancaster et al., 2004). When reporting the results of this pilot study, we adhered to the CONSORT pilot extension guidelines. By referring to these guidelines, it offered recommendations on how to appropriately report the

results from our pilot study (Eldridge et al., 2016a; Eldridge et al., 2016b) so that the results are interpretable and logical (Thabane, 2019). Another advantage of this study includes the examination of intervention acceptability among both participants and facilitators. Assessing intervention acceptability can be beneficial as not all components may be appealing to participants (Lancaster et al., 2004); this allows for modification of intervention components in a larger trial.

Limitations

Although there were noteworthy strengths of this study, it is imperative to acknowledge its limitations. While we gathered meaningful perceptions and insight from participants' exit-interviews at intervention-end, we did not capture qualitative responses at 6- and 12-weeks. Therefore, we were unable to fully capture whether follow-up assessments were acceptable and tolerable. Further, despite the benefits of delivering the intervention online, an online format prevented some individuals from participating in the study with some expressing they do not use a computer, while others experienced technical difficulties, including loss of access to internet which further led them to drop out of the study. Another limitation of the present study transpired from the effects of Covid-19. Specifically, adherence rates may have been especially high due to the restrictions from Covid-19 which allowed participants more time to be at home, possibly with fewer competing time demands (e.g., other leisure or social activities) creating an atypical situation. The possible effects of Covid-19 on adherence for the present study (i.e., strong adherence) may not be realistic once restrictions are no longer in place during the future trial. Another limitation related to adherence involves the fact that we conducted this pilot study during the winter months; adherence/participation may differ when the future efficacy trial is conducted during the summer months where people may spend more time outdoors. Lastly, the

present study attracted mostly women of Caucasian ethnicity. While this allowed us to test the feasibility among the people who are likely to sign up for the larger efficacy trial, it sheds some light on a potential limitation of a non-diverse sample that may be evident for the efficacy trial and highlights that the population we will be able to recruit may not fully represent the prediabetic population of Manitoba.

Conclusion

The present findings demonstrate the likely feasibility of a full-scale randomized controlled trial that aims to examine whether supplementing behaviour change psychoeducation with self-compassion training can lead to greater increases in physical activity among people with prediabetes. With minor amendments for the larger trial, results indicate that features of the planned intervention should be feasible and acceptable.

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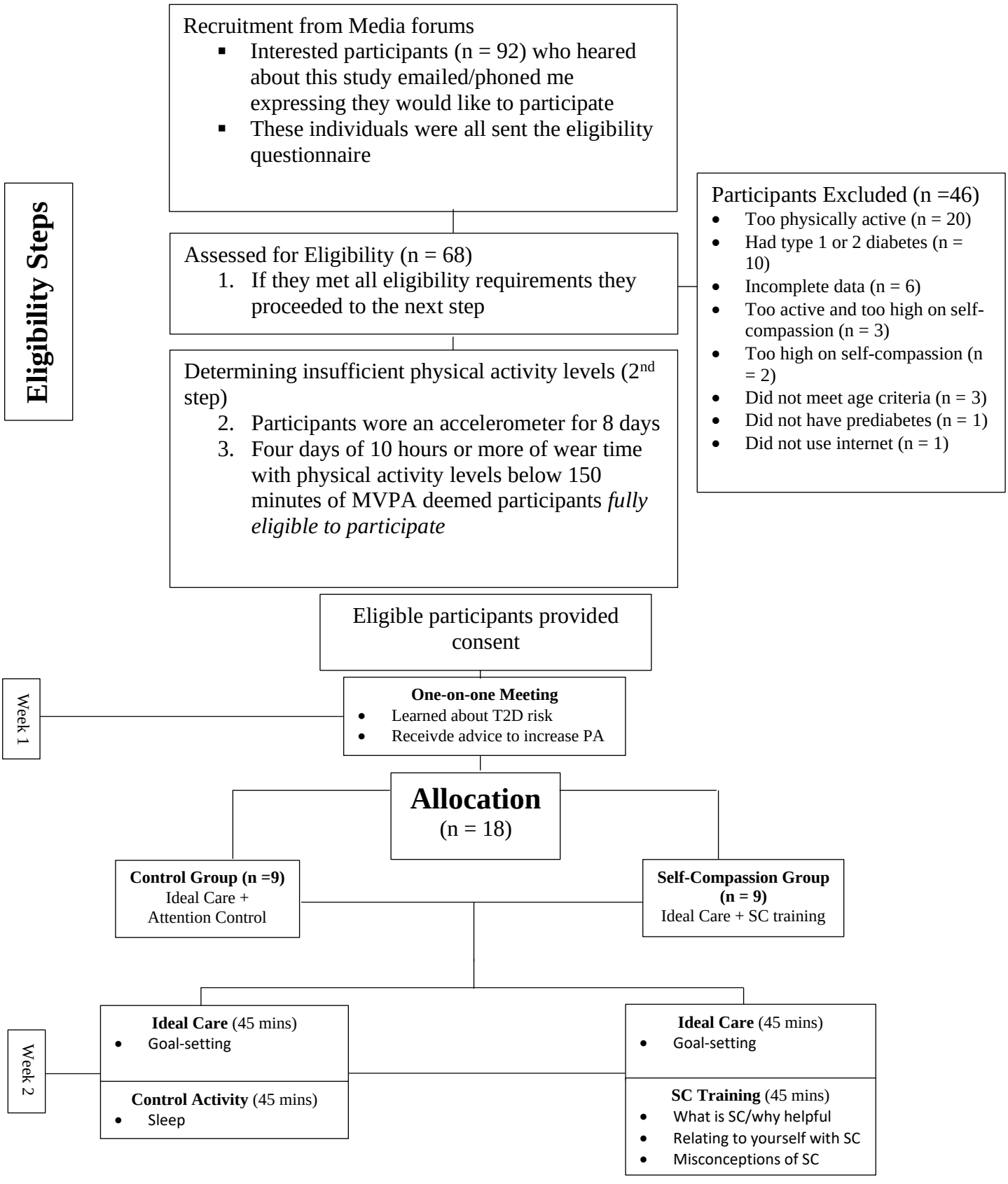
Figure 1

Procedural Flow Chart



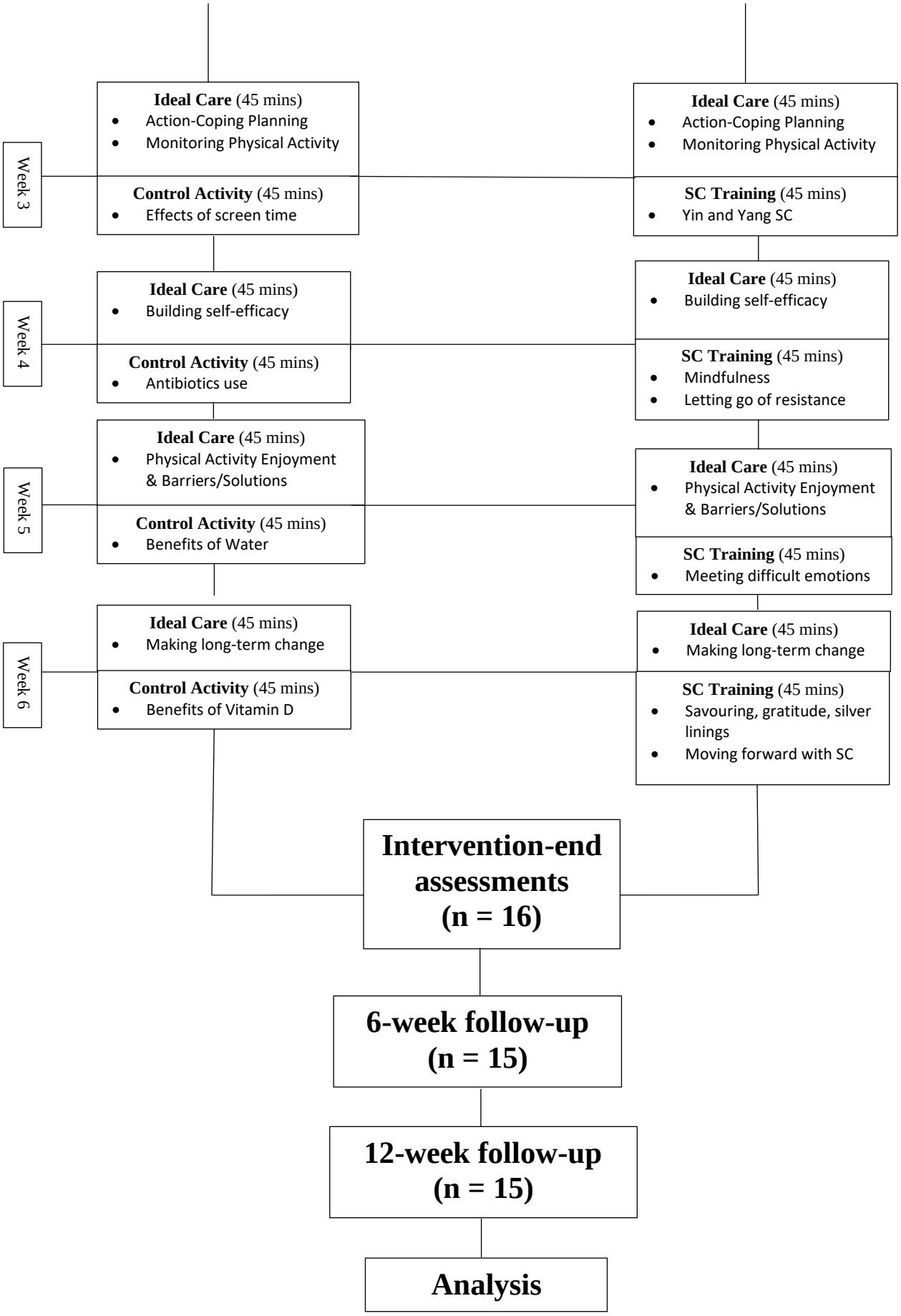

Week 3
Ideal Care (45 mins)
Action-Coping Planning
Monitoring Physical Activity
Control Activity (45 mins)
Effects of screen time
Ideal Care (45 mins)
Action-Coping Planning
Monitoring Physical Activity
SC Training (45 mins)
Yin and Yang SC
Week 4
Ideal Care (45 mins)
Building self-efficacy
Control Activity (45 mins)
Antibiotics use
Ideal Care (45 mins)
Building self-efficacy
SC Training (45 mins)
Mindfulness
Letting go of resistance
Week 5
Ideal Care (45 mins)
Physical Activity Enjoyment & Barriers/Solutions
Control Activity (45 mins)
Benefits of Water
Ideal Care (45 mins)
Physical Activity Enjoyment & Barriers/Solutions
SC Training (45 mins)
Meeting difficult emotions
Week 6
Ideal Care (45 mins)
Making long-term change
Control Activity (45 mins)
Benefits of Vitamin D
Ideal Care (45 mins)
Making long-term change
SC Training (45 mins)
Savouring, gratitude, silver linings
Moving forward with SC
Intervention-end assessments (n = 16)
6-week follow-up (n = 15)
12-week follow-up (n = 15)
Analysis

Figure 2

Intervention Timeline

<table>
<tr><td>September 2019 - August 2020</td><td colspan="2">August 7th – February 10th, 2020</td><td>February 2021</td></tr>
<tr><td>1 year</td><td colspan="2"></td><td>1 month</td></tr>
<tr><td>Preparation</td><td>Recruitment (2 month)</td><td>18 weeks (6 sessions, 6-and 12-week follow-up)</td><td>Analysis</td></tr>
<tr><td></td><td colspan="2">Intervention and Testing; Follow-up Assessment</td><td></td></tr>
</table>

Table 1

Participant Eligibility

Inclusion Criteria	Determined by:
Participants will be at moderate to high risk for developing T2D	CANRISK tool
Between ages 40-74 years old	Eligibility questionnaire
Not currently receiving medical treatment for T2D	Eligibility questionnaire
Can safely engage in physical activity	PARQ-+
Not currently participating in any T2D or behaviour change education	Eligibility questionnaire
Available for all testing and sessions	Eligibility questionnaire
Does not meet physical activity guidelines (score of 600 METS or lower; <150 minutes of MVPA per week)	International Physical Activity Questionnaire and + Gt3x ActiGraph Accelerometer
Below the mean of self-compassion (3.6 or lower)	Self-compassion Scale

Table 2

List of Measures

Type of Measure	Measure:
Eligibility and Baseline Measures	International Physical Activity Questionnaire ActiGraph GT3X+ accelerometer + Activity log Self-Compassion Scale CANRISK assessment tool PARQ-+ Additional eligibility questions: No T2D or Behavioural Change Education, no current medical treatment for T2D
Demographic Measures	CANRISK assessment tool (assessed at eligibility) Additional questions: education, ethnicity, relationship status, gender
Baseline Measures	ActiGraph GT3X+ accelerometer + Activity log International Physical Activity Questionnaire
Primary Outcome Measures	ActiGraph GT3X+ accelerometer + Activity log
Secondary and Exploratory Outcome Measures	Exercise Barriers Scale PASR-12 Negative Affect Scales Self-Compassion Scale Additional Items

Table 3

Participant baseline demographic and clinical information

Variables	Intervention Group (n = 8)	Control Group (n = 8)
Mean age in years	60.22	56.13
Sex assigned at birth		
Male	12.5%	12.5%
Female	87.5%	87.5%
How do you describe yourself?		
Male	12.5%	12.5%
Female	87.5%	87.5%
How do you think people would describe your appearance, style or dress?		
Very feminine	25.0%	25.0%
Mostly feminine	50.0%	50.0%
Somewhat feminine	12.5%	12.5%
Mostly masculine	12.5%	
Very masculine		12.5%
How do you think people would describe your mannerisms?		
Very feminine	12.5%	25.0%
Mostly feminine	62.5%	50.0%
Somewhat feminine	12.5%	12.5%
Mostly masculine	12.5%	
Very masculine		12.5%
Education		
Some high school		25.0%
High school	12.5%	
Some college or university	25.0%	25.0%
A college degree	12.5%	12.5%
An undergraduate university degree	37.5%	37.5%
Master's degree		
A doctorate	12.5%	
Ethnicity		
Caucasian	87.5%	100.0%
Aboriginal First Nations	12.5%	
Identify as Indigenous Person		
Yes	12.5%	
No	87.5%	100.0%
Member of a racialized community in Canada		
Yes		
No	100.0%	100.0%
Relationship Status		
Single	37.5%	25.0%

Common-law	12.5%	
Married	12.5%	62.5%
Separated		
Divorced	25.0%	12.5%
Widowed	12.5%	
Employment Status		
Employed full time	37.5%	50.0%
Employed part time	37.5%	12.5%
Self-employed		12.5%
Out of work	12.5%	12.5%
A homemaker		
A student		
Retired	12.5%	12.5%
Unable to work		
CANRISK Assessment		
Mean CANRISK score	41.13	43.50
BMI		
Black	50.0%	37.5%
White	12.5%	
Dark Grey	37.5%	50.0%
Light Grey		12.5%
Family History of T2D		
Yes	62.5%	75.0%
No	37.5%	25.0%

Table 4

Means and Standard Deviations of Key Study Variables

Control									
	Scale Range	**Baseline (n = 8)**		**Post-Intervention (n = 8)**		**6 -Week Follow-Up (n = 7)**		**12 -Week Follow-Up (n = 7)**	
Variable		**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Self-Compassion	1 to 5	2.90	0.61	3.26	0.73	3.23	0.68	3.25	0.75
Exercise Barriers	14 to 46	31.00	9.05	29.75	9.07	n/a	n/a	n/a	n/a
Diabetes Affect									
Sadness	4 to 28	17.25	8.33	15.00	8.96	15.86	7.47	14.14	7.84
Anxiety	4 to 28	18.25	7.19	16.75	9.03	16.00	8.43	16.28	8.20
Anger	4 to 28	12.25	7.13	12.50	7.35	11.14	6.67	10.57	5.86
Embarrassment	4 to 28	15.87	9.06	13.00	8.42	13.14	7.65	11.14	6.69
Incompetence	4 to 28	16.87	7.62	14.25	8.15	13.00	6.86	11.57	4.50
PA Affect									
Sadness	4 to 28	14.87	6.47	15.25	8.19	13.43	6.11	11.14	6.44
Anxiety	4 to 28	14.75	7.65	14.12	9.00	12.28	7.27	11.57	7.00
Anger	4 to 28	10.25	7.68	10.87	6.68	6.57	3.78	7.28	3.82
Embarrassment	4 to 28	14.50	10.17	15.00	8.14	12.86	7.20	8.43	3.73
Incompetence	4 to 28	15.00	8.18	16.25	9.18	12.57	6.92	11.57	6.32
METS Walk		168.30d	157.85	439.31d	402.33	170.50b	176.07	499.71c	476.10
METS Mod		127.50d	188.21	182.5d	255.10	220.00c	172.43	328.57c	319.55
METS Vig		0.00d	0.00	130.00d	190.94	629.71c	929.11	160.00c	236.64
Total METS week		295.80d	278.35	751.81d	476.42	721.83b	801.86	988.29c	389.12
Accel Light PA per week		1603.61	399.23	1576.41	404.13	1803.87	493.79	1695.25	341.40
Accel Mod PA per week		22.00	10.39	41.83	27.62	106.62	101.88	180.00	208.52

Accel Vig PA per week		0.00	0.00	0.58	1.01	0.00	0.00	0.00	0.00
Accel Sedentary min per day		694.82	250.39	522.46	134.84	584.92	126.89	581.57	92.90
Accel Steps per day		3671.51	1222.45	3728.75	1149.01	5305.81	2846.38	6315.64	3982.82
Self-Kindness	1 to 5	3.12	0.80	3.17	0.80	3.14	0.79	3.03	0.65
Common Humanity	1 to 5	3.22	0.56	3.34	0.56	3.39	1.07	3.21	0.68
Mindfulness	1 to 5	3.22	0.59	3.59	0.59	3.28	0.60	3.28	0.65
SelfJudgement	1 to 5	3.45	0.63	2.94	1.16	2.97	0.71	2.86	0.76
Isolation	1 to 5	3.12	1.21	2.69	1.09	2.53	1.00	2.61	1.30
OverIdentification	1 to 5	3.41	1.23	2.90	0.68	2.93	0.96	2.57	0.95

Intervention

	Scale Range	**Baseline (n = 7)**		**Post-Intervention (n = 7)**		**6 -Week Follow-Up (n = 7)**		**12 -Week Follow-Up (n = 7)**	
Variable		**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Self-Compassion	1 to 5	2.94	0.29	3.12	0.72	3.18	0.55	3.19	0.56
Exercise Barriers	14 to 46	34.58	2.22	30.15	3.93	n/a	n/a	n/a	n/a
Diabetes Affect									
Sadness	4 to 28	14.28	5.91	11.86	5.05	12.57	5.41	12.00	4.43
Anxiety	4 to 28	14.71	4.99	13.00	5.74	13.71	5.28	13.43	4.86
Anger	4 to 28	7.86	3.44	10.95	8.60	9.14	7.20	11.00	6.00
Embarrassment	4 to 28	12.28	5.09	10.28	5.19	13.14	6.39	10.71	4.39
Incompetence	4 to 28	12.00	4.58	9.71	5.99	11.14	4.74	9.14	4.02
PA Affect									
Sadness	4 to 28	13.86	6.96	11.43	5.71	13.57	5.79	12.57	6.02
Anxiety	4 to 28	15.28	4.46	12.57	5.62	12.43	5.56	11.14	4.37
Anger	4 to 28	8.14	4.81	10.00	5.86	10.14	4.49	9.86	3.39
Embarrassment	4 to 28	15.00	5.69	10.71	4.96	12.28	5.88	13.86	6.96
Incompetence	4 to 28	13.86	5.43	11.86	5.96	12.14	3.85	11.57	5.47

METS Walk		207.43c	205.83	491.04a	545.02	262.02a	309.77	227.15b	198.11
METS Mod		137.14c	130.35	751.43c	1288.30	324.57c	379.02	86.67b	114.31
METS Vig		51.43c	94.42	217.14 c	283.65	457.14c	1209.49	866.67b	2045.51
Total METS week		396.00c	212.57	1607.04a	1575.02	1308.42a	1488.23	1180.48b	2164.14
Accel Light PA per week		1762.25	626.46	1477.05	453.10	1697.33	840.10	1567.19	691.54
Accel Mod PA per week		35.89	24.11	49.44	73.15	206.67	336.85	66.12	77.77
Accel Vig PA per week		0.00	0.00	0.50	1.41	1.81	4.36	3.00	8.48
Accel Sedentary min per day		660.97	92.93	676.24	54.52	621.28	95.99	640.46	73.66
Accel Steps per day		3911.23	1801.73	3478.92	2325.78	4540.46	3311.93	3681.73	2720.35
Self-Kindness	1 to 5	2.77	0.67	2.77	0.79	3.08	0.61	2.91	0.94
Common Humanity	1 to 5	3.03	0.87	3.07	1.16	3.28	0.96	3.21	1.07
Mindfulness	1 to 5	3.03	0.57	3.36	0.70	3.46	0.67	3.43	0.69
SelfJudgement	1 to 5	2.86	0.47	2.58	0.89	2.91	0.50	2.74	0.54
Isolation	1 to 5	3.32	0.55	3.07	0.97	3.14	0.75	2.82	0.66
OverIdentification	1 to 5	3.00	0.38	2.83	0.51	2.68	0.53	2.82	0.55

**Note.* Sample sizes for each analysis are denoted next to the means.
a. 5 participants; b. 6 participants; c. 7 participants; d. 8 participants;

Table 5

Results Compared with Criteria

Recruitment	**Results**	**Criteria**	
Most successful recruitment strategy	Facebook (51.72%)	N/A	
Number of interested people	92 people	N/A	
Number of people Screened	68		
Number of eligible participants	22	N/A	
Number of eligible participants who consented and took part in the study	18	N/A	
Time for group formation (14-20 participants)	8 weeks	1 month	X
Reasons for ineligibility	43.48% too active	N/A	
Process Time	**Results**	**Criteria**	
Time to complete eligibility steps	24.67 days	2-3 weeks	X
Retention Rates	**Results**	**Criteria**	
Drop-out at intervention-end	11.11%	15-20%	☑

Drop-out at 6-and 12-weeks follow-up	8.3%	10%	☑
Reasons for drop-out	Loss of computer/internet; personal reasons	N/A	
Compliance/Adherence Rates	**Results**	**Criteria**	
Class Attendance	98.93%	80%	☑
Responses to text messages	80.25%	N/A	
Engagement in home practice	69.14%	N/A	
Home practice completion	7.06/10 (70.60%)	80%	X
Accelerometer adherence of 4 days, 10 hours	100% at baseline and 12-week follow-up; 84.62% adherence at 6-week follow-up	80%	☑
Participants wearing accelerometer	83.33%	80%	☑
Instructor Fidelity	**Results**	**Criteria**	
Fidelity/quality of one-on-one meetings	Average score: 4.83	4	☑
Fidelity/quality of group sessions	Average score: 4.5	4	☑

Covering all topics	100%	90-95%	☑
Capacity	**Results**	**Criteria**	
Hours to drop-off/pick-up accelerometers	70 hours		☑
Hours per week to send texts, emails, phone calls	4-5 hours per week		☑
Hours to conduct one-on-one meetings	20.5 hours	Within study budget	☑
Hours to prep/conduct weekly group sessions	3 hours per week		☑
Safety	**Results**	**Criteria**	
Participant safety during intervention sessions	100%	100%	☑

Appendix A: Consent Form

MOVE IT Study

Please read this form carefully and feel free to contact the researchers via phone or email if you have any questions or concerns.

Principal investigator:
Dr. Shaelyn Strachan
Assistant Professor, University of Manitoba, Faculty of Kinesiology and Recreation Management
(204) 474-6363
Shaelyn.strachan@umanitoba.ca

Research Assistants:
Brittany Semenchuk
PhD Candidate, University of Manitoba, Faculty of Health Sciences

Alana Signore
M.A Student, University of Manitoba, Faculty of Kinesiology and Recreation Management
Study Email: papsych2@umanitoba.ca

Invitation to Participate: You are invited to participate in the research study conducted by Dr. Shaelyn Strachan, Brittany Semenchuk, and Alana Signore.

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

Purpose of the Study: The purpose of this study is to compare the effectiveness of two educational sessions both designed to help people living with prediabetes increase their physical activity. You will be randomly assigned to one of these two conditions. In either condition, you will be asked to participate in 60-90-minute online intervention sessions once a week for 6-weeks. In the first session, you will meet one-on-one online with a research assistant to learn about your risk of type-2 diabetes and what you can do to lower that risk. The remaining 5 sessions will involve classroom education sessions that will be conducted in small groups online where you will learn behavioural strategies that may help you increase your physical activity. You will also be asked to fill out questionnaires about your physical activity behaviours and thoughts at the start of the intervention, at the end of the intervention and at the six and twelve-

week follow up to the study. Additionally, you will be asked to wear an accelerometer for 8 days at the start of the study, for 8 days at the end of the study as well as for 8 days at six and twelve weeks after the study has been completed.

Risks: While you will not be participating in physical activity during any of the intervention sessions (they focus on education about physical activity), this study is a physical activity intervention and you will be encouraged to increase your physical activity. Engaging in physical activity may be a potential risk to your safety as there are common injuries that may occur when engaging in this behaviour. Your participation in this study will involve the disclosure of personal information, for example your age, and occupational status. In addition, in order to achieve accurate results from the accelerometer, your height and weight will be taken by the research assistant and this may cause you to feel slightly uneasy. However, we acknowledge that all of the information that you provide will be kept in strict confidence, and no one other than the researchers (Dr. Strachan and the research assistants) will be able to trace your answers back to you.

As a participant, you will be cleared to engage in physical activity through completion of a health-screening questionnaire. If this questionnaire's findings advises, you will undergo further clearance by your family physician.

A final risk is that the time commitment (approximately 6 hours over 6 weeks) may be an inconvenience for some participants. These risks associated with this study are not expected to surpass the risks associated with daily life.

Benefits: If you are chosen to participate in this study, you may benefit from the physical activity intervention (e.g., you may increase your physical activity). You will also receive a small monetary compensation ($10) for each testing and intervention session. Further, you may be helping to contribute to the understanding of factors that influence your health and risk for Type 2 Diabetes. If you are interested, you can ask for the study results once they are available. Finally, you may also learn more about physical activity. It should be noted that these benefits are not guaranteed.

Confidentiality and anonymity: If you participate in this study, the information that you share will remain strictly confidential. Also, the principal researcher or the research assistant will merge your data (your data will not be analyzed individually) with that of the other participants and once the data collection is complete, your contact information will be dissociated from your responses. You understand that aggregated data (your individual data will not be identifiable) stemming from this research may be presented at academic conferences, published in academic journals and/or shared with relevant stakeholders (e.g., Reh-Fit, Winnipeg Health Region). Your contact information and responses will be kept on a password-protected computer in the principal investigator's locked lab or office. Any hard copies of the data will be kept in a locked filling cabinet in the principal investigator's locked lab or office as well. Neither your name nor contact information will appear in any publications stemming from this research.

Conservation of data: As explained above, the electronic data will be stored on the principal researcher's password-protected computer and on a USB mass storage device in her locked

office or lab. The USB key will also be kept in a locked filing cabinet in her office or lab, as will any hard copies of the data. When the project will be completed, the electronic data files stored on the computer will be destroyed. The USB mass storage device with original data and any hard copies of this data will then be stored in a locked filing cabinet in Dr. Shaelyn Strachan's locked office or lab for seven years. The principal investigator and the research assistant will have access to this data. Once data collection is complete and we no longer require people's email addresses or names, we will anonymize the data and delete personally identifying information (names, email, etc.) We will keep the anonymized data indefinitely in case it needs to be accessed by another researcher for, for example, a meta-analysis or systematic review. This data may be also be used and accessed through the Open Science Framework. That means that if a researcher wants to include our data in a larger study they will have access to our aggregated data. Research records and health or other source records identifying you may be inspected in the presence of the Investigator or his or her designate by representatives, Health Canada, and the University of Manitoba Research Ethics Board for the purpose of monitoring the research.

Compensation: At the first meeting with the research assistant you will be given an honorarium of $10.00 to Amazon. Participants will receive an additional $10.00 for each testing session and intervention session they attend.

Voluntary Participation: You are under no obligation to participate and if you choose to participate, you can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If you wish to withdrawal from this study, you may contact the researcher at Shaelyn.strachan@umanitoba.ca. If upon choosing to withdraw, you want to have the data that we collected from you removed, you can email the principle researcher, Dr. shaelyn.strachan@umanitoba.ca and indicate this to her. You can also ask that all of your data gathered until the time of withdrawal be destroyed and for none of your data to be used in data analyses. This withdrawal of your data will remain possible until we complete our data analysis, at which time it will not be possible to remove your data. We estimate that we will analyze the data by approximately January 2022.

Research Dissemination: You understand that for dissemination, all data will be presented in aggregate form and neither your name nor contact information will appear in any publications stemming from this research. The findings may be presented at academic conferences to other researchers and academics in the field and/or published in academic journals.

Debriefing: You understand that at the end of the study you will be debriefed on the study details. At the end of the study you will be provided with the opportunity to leave your contact information and, when available (approximately in the Winter or Spring of 2022), a summary of results will be emailed or mailed to you.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be

as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way. This research has been approved by the Education and Nursing Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator (HEC) at 474-7122 or by email at humanethics@umanitoba.ca. A copy of this consent form has been given to you to keep for your records and reference.

1. If you consent to participate in this study please check off the box below:

☐ Yes, I consent to participate in the study

Signature: _____

☐ No, I would not like to participate in the study

2. If you would like to participate, do you wish to receive to receive a summary of results at the end of the study?

☐ Yes
☐ No

If so, provide a mailing or email address that you would like these results sent to:

3. Future Contact: We are conducting interviews after the group sessions to understand what participants' thoughts and feelings were about the content and group setting. If you would be interested on sharing your thoughts after the education sessions through an online interview, please check off the first box below.

☐ I am interested in being contacted about the online interview after the group sessions
☐ If other future research opportunities present themselves, the researcher may contact me as a potential research subject.
☐ I would not like to be contacted about future research

Appendix B: Debriefing Form

Thank you very much for participating in this study. You have contributed to our research study in a big way and we couldn't appreciate you more! Now that you have completed the study, please take a minute to read the rest of this form as it will provide you with feedback and more specific information about the purpose of this study. **We also ask that you do not share any of this information with others who are still in the process of participating in this study**.

Purpose

The true purpose of this pilot study was to determine if providing people with traditional behaviour change education (e.g., goal-setting, planning, overcoming barriers to physical activity etc.) as well as training in how to relate to yourself with self-compassion as you go through this challenge can lead to a clinically significant increase in engagement in physical activity as compared to receiving only the behaviour change information in individuals with prediabetes. We made the hypothesis that learning to be self-compassionate will provide further benefit in terms of physical activity adherence over just learning about behaviour change. If you were in the group that received behaviour change training but not self-compassion training, you still received what is considered "best practice" for helping people with prediabetes become more physically active. People in this condition also received information about other health topics, such as sleep and sun protection. We provided this information to these participants so that participants in both groups would receive the same amount of attention. A second thing we will look at from your data is whether certain psychological variables (e.g., emotions, your ability to manage your exercise behaviour) account for our intervention's potential effect on physical activity. Finally, we will examine our data to see how feasible it would be to conduct a larger study of this kind.

The results to this study are still in the process of being collected. We look forward to seeing whether self-compassion training can improve upon the benefit of standard behaviour change training in helping people with prediabetes engage in more physical activity. We anticipate the results will be collected, analyzed, and summarized by the Winter or Spring of 2022. If you did not indicate on the consent form that you would like to be contacted with the summary of the results, please contact the principal investigator.

Once data collection is complete and we no longer require people's email addresses or names to line up their time points, we will anonymize the data and delete personally identifying information (names, email, etc.) We will keep the anonymized data indefinitely in case it needs to be accessed by another researcher for, for example, a meta-analysis or systematic review. This data may be used and accessed through the OpenScience Framework.

After participating in this intervention and completing the questionnaire, some participants may experience feelings of stress, difficult emotions, or possibly injury from engaging in physical activity. Here are some local resources that you can reach out to if you are experiencing any of these challenges:

Health Links: 1-888-315-9257
WRHA Mobile Crisis Service: 204-940-1781
Victoria General Hospital (Urgent Care): 204-477-3148

If you have questions or comments about this study, please contact the principle researcher (contact information listed below). Again, we ask that you not share the information presented here. It is possible that if participants know the whole purpose of the study, the results may be affected.

Thanks again for your participation!
Principal Investigator:
Shaelyn Strachan
University of Manitoba, Faculty of Kinesiology & Recreation Management
shaelyn.strachan@umanitoba.ca
(204) 474-6363**We would also like to assure you that the University of Manitoba Education/Nursing Research Ethics Board has approved of this research. If you have any questions regarding your rights as a participant, you may contact the Human Ethics Coordinator at: (204) 474-7122 or humanethics@umanitoba.ca.**

Appendix C: Eligibility and Baseline Measures

1. International Physical Activity Questionnaire (see Appendix C.3)
2. ActiGraph GT3X+ accelerometer + Activity log (see Appendix C.4)
3. Self-Compassion Scale (see Appendix C.5)
4. CANRISK assessment tool (see Appendix C.1)
5. PARQ-+ (see Appendix C.2)
6. **Additional eligibility questions**: No T2D or Behavioural Change Education, no current medical treatment for T2D (see below)

6. Additional eligibility questions

1. Are you currently receiving any medical treatment for Type 2 Diabetes?
   a. Yes: _____
      Please Specify: _____
   b. No: _____

2. Are you currently enrolled in any education or training programs related to prediabetes or health behaviour change?
   a. Yes: _____
      Please Specify: _____
   b. No: _____

3. Are you available for all sessions and testing for this study?

Appendix C.1: CANRISK Tool

(Canadian Pharmacists Association, 2011)

1. Select your age group:
   a. 40-44 years
   b. 45-54 years
   c. 55-64 years
   d. 65-74 years

2. Are you male or female?
   a. Male
   b. Female

3. On the left-hand side of the BMI chart below, note your height then look to the bottom of the chart and note your weight. Find the square on the chart where your height crosses with your weight and note which shaded area you fall into. For example, if you are 5 feet, 2 inches (or 157.5 cm) and 163 pounds (or 74 kg) you fall in the LIGHT GREY area.

   Select your BMI group from the following choices:
   a. White (BMI less than 25)
   b. Light grey (BMI 25 to 29)
   c. Dark grey (BMI 30 to 34)
   d. Black (BMI 35 and over)

HEIGHT feet/inches	cm																												
6'4"	192.5	12	13	13	14	15	16	17	18	18	19	20	21	22	22	23	24	24	26	26	27	28	29	29	30	31	32	33	34
6'3"	190	12	13	14	15	16	16	17	18	19	20	20	21	22	23	24	24	25	26	27	28	29	29	30	31	32	33	34	34
6'2"	187.5	13	13	14	15	16	17	18	18	19	20	21	22	23	24	24	25	26	27	28	29	29	30	31	32	33	34	34	36
6'1"	185	13	14	15	15	16	17	18	19	20	21	22	22	23	24	25	26	27	28	29	29	30	31	32	33	34	34	36	37
6'0"	182.5	13	14	15	16	17	18	19	20	20	21	22	23	24	24	26	27	28	29	29	30	31	32	33	34	34	36	37	38
5'11"	180	14	15	15	16	17	18	19	20	21	22	23	24	24	26	27	27	28	29	30	31	32	33	34	34	36	37	38	39
5'10"	177.5	14	15	16	17	18	19	20	21	22	23	23	24	25	26	27	28	29	30	31	32	33	34	34	36	37	38	39	40
5'9"	175	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	34	36	37	38	39	40	41
5'8"	172.5	15	16	17	18	19	20	21	22	23	24	24	26	27	28	29	29	31	32	33	34	34	36	37	38	39	40	41	42
5'7"	170	15	16	17	18	19	20	21	22	24	24	26	27	28	29	29	31	32	33	34	34	36	37	38	39	40	41	42	43
5'6"	167.5	16	17	18	19	20	21	22	23	24	25	26	27	29	29	31	32	33	34	34	36	37	38	39	40	41	42	43	45
5'5"	165	16	17	18	19	21	22	23	24	24	26	27	28	29	30	32	33	34	34	36	37	38	39	40	42	43	44	45	46
5'4"	162.5	17	18	19	20	21	22	23	24	26	27	28	29	30	31	33	34	34	36	37	38	39	41	42	43	44	45	46	47
5'3"	160	17	18	20	21	22	23	24	25	27	28	29	30	31	32	34	34	36	37	38	39	41	42	43	44	45	46	48	49
5'2"	157.5	18	19	20	21	23	24	24	26	27	29	29	31	32	33	34	36	37	38	40	41	42	43	44	46	47	48	49	50
5'1"	155	18	20	21	22	23	24	26	27	28	29	31	32	33	34	36	37	38	40	41	42	43	45	46	47	48	50	51	52
5'0"	152.5	19	20	21	23	24	25	27	28	29	31	32	33	34	36	37	38	40	41	42	43	45	46	47	49	50	51	52	54
4'11"	150	20	21	22	24	24	26	28	29	30	32	33	34	36	37	38	40	41	42	44	45	46	48	49	50	52	53	54	56
4'10"	147.5	20	22	23	24	26	27	28	29	31	33	34	35	37	38	40	41	42	44	45	46	48	49	51	52	53	55	56	57
4'9"	145	21	22	24	25	27	28	29	31	32	34	35	37	38	39	41	42	44	45	47	48	49	51	52	54	55	57	58	59
4'8"	142.5	22	23	24	26	28	29	31	32	33	34	36	38	39	41	42	44	45	47	48	50	51	53	54	56	57	59	60	62
WEIGHT (kg)		44	47	50	53	56	59	62	65	68	71	74	77	80	83	86	89	92	95	98	101	104	107	110	113	116	119	122	125
WEIGHT (lbs)		97	103	110	117	123	130	136	143	150	156	163	169	176	183	189	196	202	209	216	222	229	235	242	249	255	262	268	275

4. Using a tape measure, place it around your waist at the level of your belly button.

   MEN – Waist circumference: _____inches OR _____cm
   - ☐ Less than 94 cm or 37 inches
   - ☐ Between 94–102 cm or 37–40 inches
   - ☐ Over 102 cm or 40 inches

   WOMEN – Waist circumference: _____inches OR _____cm
   - ☐ Less than 80 cm or 31.5 inches
   - ☐ Between 80–88 cm or 31.5–35 inches
   - ☐ Over 88 cm or 35 inches

5. Do you usually do some physical activity such as brisk walking for at least 30 minutes each day? This activity can be done while at work or at home.
   a. Yes
   b. No

6. How often do you eat vegetables or fruits?
   a. Every day
   b. Not every day

7. Have you ever been told by a doctor or nurse that you have high blood pressure OR have you ever taken high blood pressure pills?
   a. Yes
   b. No

8. Have you ever been found to have a high blood sugar either from a blood test, during an illness, or during pregnancy?
   a. Yes
   b. No or don't know

9. Have you ever given birth to a large baby weighing 9 lbs (4.1 kg) or more?
   a. Yes
   b. No, don't know or not applicable
10. Have any of your blood relatives ever been diagnosed with diabetes? Check ALL that apply.
   a. Mother
   b. Father
   c. Brothers/Sisters
   d. Children
   e. Other
   f. No/don't know

11. Please check off which of the following ethnic groups your biological (blood) parents belong to:

Mother	Father	
☐	☐	White (Caucasian)
☐	☐	Aboriginal (First Nations Person, Métis, Inuit)
☐	☐	Black (Afro-Caribbean)
☐	☐	East Asian (Chinese, Vietnamese, Filipino, Korean, etc.)
☐	☐	South Asian (East Indian, Pakistani, Sri Lankan, etc.)
☐	☐	Other non-white (Latin American, Arab, West Asian)

12. What is the highest level of education that you have completed?

   a. Some high school or less

   b. High school diploma

   c. Some college or university

   d. University or college degree

Appendix C.2: PAR-Q-+

2019 PAR-Q+

The Physical Activity Readiness Questionnaire for Everyone

The health benefits of regular physical activity are clear; more people should engage in physical activity every day of the week. Participating in physical activity is very safe for MOST people. This questionnaire will tell you whether it is necessary for you to seek further advice from your doctor OR a qualified exercise professional before becoming more physically active.

GENERAL HEALTH QUESTIONS

Please read the 7 questions below carefully and answer each one honestly: check YES or NO.	YES	NO
1) Has your doctor ever said that you have a heart condition ☐ OR high blood pressure ☐?	☐	☐
2) Do you feel pain in your chest at rest, during your daily activities of living, **OR** when you do physical activity?	☐	☐
3) Do you lose balance because of dizziness **OR** have you lost consciousness in the last 12 months? Please answer **NO** if your dizziness was associated with over-breathing (including during vigorous exercise).	☐	☐
4) Have you ever been diagnosed with another chronic medical condition (other than heart disease or high blood pressure)? **PLEASE LIST CONDITION(S) HERE:** _____	☐	☐
5) Are you currently taking prescribed medications for a chronic medical condition? **PLEASE LIST CONDITION(S) AND MEDICATIONS HERE:** _____	☐	☐
6) Do you currently have (or have had within the past 12 months) a bone, joint, or soft tissue (muscle, ligament, or tendon) problem that could be made worse by becoming more physically active? Please answer **NO** if you had a problem in the past, but it **does not limit your current ability** to be physically active. **PLEASE LIST CONDITION(S) HERE:** _____	☐	☐
7) Has your doctor ever said that you should only do medically supervised physical activity?	☐	☐

If you answered NO to all of the questions above, you are cleared for physical activity.
Please sign the PARTICIPANT DECLARATION. You do not need to complete Pages 2 and 3.

- Start becoming much more physically active – start slowly and build up gradually.
- Follow International Physical Activity Guidelines for your age (www.who.int/dietphysicalactivity/en/).
- You may take part in a health and fitness appraisal.
- If you are over the age of 45 yr and NOT accustomed to regular vigorous to maximal effort exercise, consult a qualified exercise professional before engaging in this intensity of exercise.
- If you have any further questions, contact a qualified exercise professional.

PARTICIPANT DECLARATION
If you are less than the legal age required for consent or require the assent of a care provider, your parent, guardian or care provider must also sign this form.

I, the undersigned, have read, understood to my full satisfaction and completed this questionnaire. I acknowledge that this physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if my condition changes. I also acknowledge that the community/fitness center may retain a copy of this form for its records. In these instances, it will maintain the confidentiality of the same, complying with applicable law.

NAME _____ DATE _____

SIGNATURE _____ WITNESS _____

SIGNATURE OF PARENT/GUARDIAN/CARE PROVIDER _____

If you answered YES to one or more of the questions above, COMPLETE PAGES 2 AND 3.

Delay becoming more active if:

- You have a temporary illness such as a cold or fever; it is best to wait until you feel better.
- You are pregnant - talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the ePARmed-X+ at **www.eparmedx.com** before becoming more physically active.
- Your health changes - answer the questions on Pages 2 and 3 of this document and/or talk to your doctor or a qualified exercise professional before continuing with any physical activity program.

 1 / 4
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FOLLOW-UP QUESTIONS ABOUT YOUR MEDICAL CONDITION(S)

1. Do you have Arthritis, Osteoporosis, or Back Problems?

If the above condition(s) is/are present, answer questions 1a-1c — If **NO** ☐ go to question 2

1a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)	YES ☐ NO ☐
1b.	Do you have joint problems causing pain, a recent fracture or fracture caused by osteoporosis or cancer, displaced vertebra (e.g., spondylolisthesis), and/or spondylolysis/pars defect (a crack in the bony ring on the back of the spinal column)?	YES ☐ NO ☐
1c.	Have you had steroid injections or taken steroid tablets regularly for more than 3 months?	YES ☐ NO ☐

2. Do you currently have Cancer of any kind?

If the above condition(s) is/are present, answer questions 2a-2b — If **NO** ☐ go to question 3

2a.	Does your cancer diagnosis include any of the following types: lung/bronchogenic, multiple myeloma (cancer of plasma cells), head, and/or neck?	YES ☐ NO ☐
2b.	Are you currently receiving cancer therapy (such as chemotheraphy or radiotherapy)?	YES ☐ NO ☐

3. Do you have a Heart or Cardiovascular Condition? This includes Coronary Artery Disease, Heart Failure, Diagnosed Abnormality of Heart Rhythm

If the above condition(s) is/are present, answer questions 3a-3d — If **NO** ☐ go to question 4

3a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)	YES ☐ NO ☐
3b.	Do you have an irregular heart beat that requires medical management? (e.g., atrial fibrillation, premature ventricular contraction)	YES ☐ NO ☐
3c.	Do you have chronic heart failure?	YES ☐ NO ☐
3d.	Do you have diagnosed coronary artery (cardiovascular) disease and have not participated in regular physical activity in the last 2 months?	YES ☐ NO ☐

4. Do you have High Blood Pressure?

If the above condition(s) is/are present, answer questions 4a-4b — If **NO** ☐ go to question 5

4a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)	YES ☐ NO ☐
4b.	Do you have a resting blood pressure equal to or greater than 160/90 mmHg with or without medication? (Answer **YES** if you do not know your resting blood pressure)	YES ☐ NO ☐

5. Do you have any Metabolic Conditions? This includes Type 1 Diabetes, Type 2 Diabetes, Pre-Diabetes

If the above condition(s) is/are present, answer questions 5a-5e — If **NO** ☐ go to question 6

5a.	Do you often have difficulty controlling your blood sugar levels with foods, medications, or other physician-prescribed therapies?	YES ☐ NO ☐
5b.	Do you often suffer from signs and symptoms of low blood sugar (hypoglycemia) following exercise and/or during activities of daily living? Signs of hypoglycemia may include shakiness, nervousness, unusual irritability, abnormal sweating, dizziness or light-headedness, mental confusion, difficulty speaking, weakness, or sleepiness.	YES ☐ NO ☐
5c.	Do you have any signs or symptoms of diabetes complications such as heart or vascular disease and/or complications affecting your eyes, kidneys, **OR** the sensation in your toes and feet?	YES ☐ NO ☐
5d.	Do you have other metabolic conditions (such as current pregnancy-related diabetes, chronic kidney disease, or liver problems)?	YES ☐ NO ☐
5e.	Are you planning to engage in what for you is unusually high (or vigorous) intensity exercise in the near future?	YES ☐ NO ☐

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If you answered NO to all of the FOLLOW-UP questions (pgs. 2-3) about your medical condition, you are ready to become more physically active - sign the PARTICIPANT DECLARATION below:

- It is advised that you consult a qualified exercise professional to help you develop a safe and effective physical activity plan to meet your health needs.
- You are encouraged to start slowly and build up gradually - 20 to 60 minutes of low to moderate intensity exercise, 3-5 days per week including aerobic and muscle strengthening exercises.
- As you progress, you should aim to accumulate 150 minutes or more of moderate intensity physical activity per week.
- If you are over the age of 45 yr and **NOT** accustomed to regular vigorous to maximal effort exercise, consult a qualified exercise professional before engaging in this intensity of exercise.

If you answered YES to one or more of the follow-up questions about your medical condition:

You should seek further information before becoming more physically active or engaging in a fitness appraisal. You should complete the specially designed online screening and exercise recommendations program - the **ePARmed-X+ at www.eparmedx.com** and/or visit a qualified exercise professional to work through the ePARmed-X+ and for further information.

Delay becoming more active if:

- You have a temporary illness such as a cold or fever; it is best to wait until you feel better.
- You are pregnant - talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the ePARmed-X+ **at www.eparmedx.com** before becoming more physically active.
- Your health changes - talk to your doctor or qualified exercise professional before continuing with any physical activity program.

- You are encouraged to photocopy the PAR-Q+. You must use the entire questionnaire and NO changes are permitted.
- The authors, the PAR-Q+ Collaboration, partner organizations, and their agents assume no liability for persons who undertake physical activity and/or make use of the PAR-Q+ or ePARmed-X+. If in doubt after completing the questionnaire, consult your doctor prior to physical activity.

PARTICIPANT DECLARATION

- All persons who have completed the PAR-Q+ please read and sign the declaration below.
- If you are less than the legal age required for consent or require the assent of a care provider, your parent, guardian or care provider must also sign this form.

I, the undersigned, have read, understood to my full satisfaction and completed this questionnaire. I acknowledge that this physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if my condition changes. I also acknowledge that the community/fitness center may retain a copy of this form for records. In these instances, it will maintain the confidentiality of the same, complying with applicable law.

NAME _____ DATE _____

SIGNATURE _____ WITNESS _____

SIGNATURE OF PARENT/GUARDIAN/CARE PROVIDER _____

For more information, please contact

www.eparmedx.com

Email: eparmedx@gmail.com

Citation for PAR-Q+

Warburton DER, Jamnik VK, Bredin SSD, and Gledhill N on behalf of the PAR-Q+ Collaboration. The Physical Activity Readiness Questionnaire for Everyone (PAR-Q+) and Electronic Physical Activity Readiness Medical Examination (ePARmed-X+). Health & Fitness Journal of Canada 4(2):3-23, 2011.

Key References

1. Jamnik VK, Warburton DER, Makarski J, McKenzie DC, Shephard RJ, Stone J, and Gledhill N. Enhancing the effectiveness of clearance for physical activity participation: background and overall process. APNM 36(S1):S3-S13, 2011.
2. Warburton DER, Gledhill N, Jamnik VK, Bredin SSD, McKenzie DC, Stone J, Charlesworth S, and Shephard RJ. Evidence-based risk assessment and recommendations for physical activity clearance: Consensus Document. APNM 36(S1):S266-s298, 2011.
3. Chisholm DM, Collis ML, Kulak LL, Davenport W, and Gruber N. Physical activity readiness. British Columbia Medical Journal. 1975;17:375-378.
4. Thomas S, Reading J, and Shephard RJ. Revision of the Physical Activity Readiness Questionnaire (PAR-Q). Canadian Journal of Sport Science. 1992;17:4:338-345.

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6. Do you have any Mental Health Problems or Learning Difficulties? This includes Alzheimer's, Dementia, Depression, Anxiety Disorder, Eating Disorder, Psychotic Disorder, Intellectual Disability, Down Syndrome

If the above condition(s) is/are present, answer questions 6a-6b If **NO** ☐ go to question 7

6a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)	YES ☐ NO ☐
6b.	Do you have Down Syndrome **AND** back problems affecting nerves or muscles?	YES ☐ NO ☐

7. Do you have a Respiratory Disease? This includes Chronic Obstructive Pulmonary Disease, Asthma, Pulmonary High Blood Pressure

If the above condition(s) is/are present, answer questions 7a-7d If **NO** ☐ go to question 8

7a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)	YES ☐ NO ☐
7b.	Has your doctor ever said your blood oxygen level is low at rest or during exercise and/or that you require supplemental oxygen therapy?	YES ☐ NO ☐
7c.	If asthmatic, do you currently have symptoms of chest tightness, wheezing, laboured breathing, consistent cough (more than 2 days/week), or have you used your rescue medication more than twice in the last week?	YES ☐ NO ☐
7d.	Has your doctor ever said you have high blood pressure in the blood vessels of your lungs?	YES ☐ NO ☐

8. Do you have a Spinal Cord Injury? This includes Tetraplegia and Paraplegia

If the above condition(s) is/are present, answer questions 8a-8c If **NO** ☐ go to question 9

8a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)	YES ☐ NO ☐
8b.	Do you commonly exhibit low resting blood pressure significant enough to cause dizziness, light-headedness, and/or fainting?	YES ☐ NO ☐
8c.	Has your physician indicated that you exhibit sudden bouts of high blood pressure (known as Autonomic Dysreflexia)?	YES ☐ NO ☐

9. Have you had a Stroke? This includes Transient Ischemic Attack (TIA) or Cerebrovascular Event

If the above condition(s) is/are present, answer questions 9a-9c If **NO** ☐ go to question 10

9a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer NO if you are not currently taking medications or other treatments)	YES ☐ NO ☐
9b.	Do you have any impairment in walking or mobility?	YES ☐ NO ☐
9c.	Have you experienced a stroke or impairment in nerves or muscles in the past 6 months?	YES ☐ NO ☐

10. Do you have any other medical condition not listed above or do you have two or more medical conditions?

If you have other medical conditions, answer questions 10a-10c If **NO** ☐ read the Page 4 recommendations

10a.	Have you experienced a blackout, fainted, or lost consciousness as a result of a head injury within the last 12 months **OR** have you had a diagnosed concussion within the last 12 months?	YES ☐ NO ☐
10b.	Do you have a medical condition that is not listed (such as epilepsy, neurological conditions, kidney problems)?	YES ☐ NO ☐
10c.	Do you currently live with two or more medical conditions?	YES ☐ NO ☐

PLEASE LIST YOUR MEDICAL CONDITION(S) AND ANY RELATED MEDICATIONS HERE: _____

_____

GO to Page 4 for recommendations about your current medical condition(s) and sign the PARTICIPANT DECLARATION.

Appendix C.3: IPAQ

(Forde, 2018)

1a. During the last 7 days, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling,?

Think about *only* those physical activities that you did for at least 10 minutes at a time.

_____ days per week ⇨

1b. How much time in total did you usually spend on one of those days doing vigorous physical activities?

_____ hours _____ minutes

or

☐ **none**

2a. Again, think *only* about those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ days per week ⇨

2b. How much time in total did you usually spend on one of those days doing moderate physical activities?

_____ hours _____ minutes

or

☐ **none**

3a. During the last 7 days, on how many days did you **walk** for at least 10 minutes at a time? This includes walking at work and at home, walking to travel from place to place, and any other walking that you did solely for recreation, sport, exercise or leisure.

_____ days per week ⇨

3b. How much time in total did you usually spend walking on one of those days?

_____ hours _____ minutes

or

☐ **none**

The last question is about the time you spent sitting on weekdays while at work, at home, while doing course work and during leisure time. This includes time spent sitting at a desk, visiting friends, reading traveling on a bus or sitting or lying down to watch television.

4. During the last 7 days, how much time in total did you usually spend *sitting* on a **week day?**

____ hours _____ minutes

Appendix C.4 Activity Monitor Log Sheet

Please note the ***time*** you put the monitor ***on and off each day*** and approximate ***start/end times*** of any ***moderate-to-vigorous activity*** you participated in (anything you remember that lasted more than a few minutes). Please also indicate the ***time*** you **wake up and go to sleep** each day**. If you did not participate in any planned moderate-to vigorous activity, you do not need to fill out this section.**
**Please do not wear the accelerometer while you are sleeping.

A= first moderate-to-vigorous activity of the day,
B = second moderate-to-vigorous activity of the day,
C = third moderate-to-vigorous activity of the day

Moderate physical activities are activities that make you breath faster and your heart beat faster than normal.
Examples of activities that would be moderate intensity physical activity include brisk walking, biking, and strength training.

Vigorous physical activity are activities when your heart is beating really fast and you would be unable to keep up a conversation with someone. Examples of vigorous physical activity would include running, fast biking, heavy yardwork.

Example of how to fill out the tracking sheet:

	Day 1
DATE:	January 15, 2021
Monitor ON	7:30 am
Monitor OFF	11:45 pm
Woke up:	7:15 am
Went to sleep:	12:00 am
Type of moderate-vigorous activity A	Hiking
Approximate start and end times of moderate-vigorous activity A	1:00 pm – 1:45 pm

Type of moderate-vigorous **activity B**	Cleaning the house
Approximate start and end times of moderate-vigorous **activity B**	4:00 pm – 4:20 pm

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
DATE:								
Woke up:								
Monitor ON:								
Monitor OFF:								
Went to sleep:								
Type of moderate-vigorous **activity A**								
Approximate start and end times of moderate-vigorous **activity A**								
Type of moderate-vigorous **activity B**								

Approximate start and end times of moderate-vigorous activity B								
Type of moderate-vigorous activity C								
Approximate start and end times of moderate-vigorous activity C								

If you have any questions at all, please contact Alana at papsych2@umanitoba.

Appendix C.5: Self-Compassion Scale

(Neff, 2003b)

Please read each statement carefully and answer regarding how you typically act towards yourself in difficult times. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

1(Almost never) ------ 2 ----- 3 ------ 4 ------ 5 (Almost Always)

____ 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.

Appendix D: Demographics

1. Age (see eligibility measures – **Appendix C**)
2. Anthropometrics (see CANRISK – eligibility measures – **Appendix C.1**)
3. **Education (see below)**
4. **Ethnicity (see below)**
5. **Gender (see below)**
6. **Relationship status (see below)**

3. Education

Please indicate the highest level of education you have completed by choosing from the options below:

Some high school ___
Highschool ___
Some college or university ____
A college degree____
An undergraduate university degree____
A masters degree____
A doctorate ___

4. Ethnicity

Do you self-identify as an Indigenous Person? (drop down menu)
[ ] Yes
[ ] No

If you answered "yes", please indicate all that apply: (drop down menu)
___ First Nation
___ Metis
___ Inuit

A member of a racialized community in Canada is someone (other than an Indigenous Person) who self-identifies as non-white in color or non-Caucasian in racial origin, regardless of birthplace or citizenship. Members of ethnic or national groups (such as Portuguese, Italian, Greek, etc.) are not considered to be racially visible unless they also meet the criteria above.

Do you self-identify as a member of a racialized community in Canada? (drop down menu)
[ ] Yes
[ ] No

If you answered "yes", please check all that apply:
___ Black (e.g., African, American, Canadian, Caribbean)
___ Chinese
___ Filipino

___ Japanese
___ Korean
___ Indigenous person from outside North America
___ South Asian/East Indian (e.g., Bangladeshi, Pakistani, Indian from India, East Indian from Guyana, Trinidadian, Sri Lankan, East African)
___ South East Asian (e.g., Burmese, Cambodian/Kampuchean, Laotian,
___ Malaysian, Thai, Vietnamese, Indonesian)
___ Non-White West Asian (e.g., Iranian, Lebanese, Afghan)
___ Non-White North African (e.g., Egyptian, Libyan)
___ Arab
___ Non-White Latin American (including indigenous person from Central and South America)
___ Person of Mixed Origin (with one parent in one of the racialized groups listed above)
___ Other Please Identify

5. Gender - Recommended "Two Step" Approach for measuring gender identity

Assigned Sex at Birth

What sex were you assigned at birth, on your original birth certificate?
[ ] Male
[ ] Female

Current Gender Identity

How do you describe yourself? (check one)
[ ] Male
[ ] Female
[ ] Transgender
[ ] Do not identity as female, male or transgender

Gender Conformity/Nonconformity Continuum

1. A person's appearance, style, or dress may affect the way people think of them. On average, how do you think people would describe your appearance, style or dress? (Mark one answer)
[ ] Very feminine
[ ] Mostly feminine
[ ] Somewhat feminine
[ ] Equally feminine and masculine
[ ] Somewhat masculine
[ ] Mostly masculine
[ ] Very masculine

2. A person's mannerisms (such as the way they walk or talk) may affect the way people think of them. On average, how do you think people would describe your mannerisms? (Mark one answer)
[ ] Very feminine

[ ] Mostly feminine
[ ] Somewhat feminine
[ ] Equally feminine and masculine
[ ] Somewhat masculine
[ ] Mostly masculine
[ ] Very masculine

The GenIUSS Group. (2014). Best Practices for Asking Questions to Identity Transgender and Other Gender Minority Respondents on Population-Based Surveys. J.L. Herman (Ed.). Los Angeles, CA: The Williams Institute.

6. Relationship Status

Please indicate your relationship status:

Single ____
Common-law ____
Married ____
Separated ____
Divorced ____
Widowed ____

Appendix E: Secondary Measures Descriptions

Self-regulatory skill use. The Physical Activity Self-Regulation Scale-12 (PASR-12) was employed to assess participants' physical activity self-regulatory skill use (Umstattd et al., 2009). This 12-item scale consists of six subscales: self-monitoring, goal setting, eliciting social support, reinforcements, time-management, and relapse prevention (see Appendix E.3). The PASR-12 includes statements such as "I mentally kept track of my physical activity" or "I set physical activity goals that focused on my health." Participants were asked to respond to these statements using a 5-point Likert scale ranging from 1 (*never*) to 5 (*very often*). Individual item scores were added together to determine the scores of each sub-scale. A total score is created by adding together all sub-scale scores (Umstattd et al., 2009). I chose this scale because it is valid (Umstattd et al., 2009) and because it has been used in past self-compassion research (Hallion et al., 2019). Hallion and colleagues (2019) further report that the PASR-12 exhibits high internal consistency ($\alpha = .94$).

Negative affect. The Negative Affect Scale was used to measure participants' emotions (Leary et al., 2007) in relation to their (i) T2D risk and (ii) physical activity engagement. Specifically, this scale measureed the extent to which participants experienced five different emotions in these two contexts; participants completed a separate scale for each context (see Appendix E.1 and E.2). Each scale included 20-items that embody these five emotions: sadness (*sad, dejected, down, depressed*), anxiety (*nervous, worried, anxious, fearful*), anger (*irritated, angry, hostile, mad*), embarrassment (*embarrassed, humiliated, disgraced, ashamed*), and feelings of incompetence (*incompetent, worthless, stupid, self-conscious*). Participants answered questions such as "After hearing about your type 2 diabetes risk/when thinking about my engagement in physical activity, to what degree do you feel sad?". They responded to each

statement using a 7-point Likert scale that ranged from 1 (*not at all*) to 7 (*extremely*). A total score is calculated for each subscale for both contexts. The wording of the instructions and questions were slightly altered from previous studies (Leary et al., 2007; Reis et al., 2015) to reflect participants' emotional reactions and feelings about their risk for T2D/their physical activity engagement. Versions of this scale demonstrate acceptable reliability ($\alpha = .75$; Leary et al. (2007) and have been employed in self-compassion research (Semenchuk et al., 2018).

Exercise barriers. To assess whether participants experienced additional barriers to physical activity, beyond negative emotions, the 14-item Exercise Barrier Scale (See Appendix E.4) was employed (Sechrist et al., 1987). Participants were asked to indicate the degree to which they conveyed different barriers to exercise using a 4-point Likert scale ranging from 1 (*strongly agree)* to 4 (*strongly disagree*). A sample item included: "Exercising takes too much of my time". A total score is created. Higher scores indicated greater barriers to exercise (Sechrist et al., 1987). This scale has also been shown to be reliable and valid with Cronbach's alpha of $\alpha = 0.87$ (Victor et al., 2012).

Self-compassion. To measure participants' levels of self-compassion; how they typically treat themselves in difficult times, the 26-item Self-Compassion Scale was used (Neff, 2003b; see Appendix C.5). Determining self-compassion levels was used as an eligibility requirement and will be used as manipulation check on the self-compassion intervention. It was measured at baseline, intervention-end, 6- and 12-weeks follow-up. This scale measured the three main components of self-compassion captured through 6 subscales: self-kindness, self-judgement, common humanity, isolation, mindfulness, and over-identification. Participants were asked to indicate how often they behave in the stated manner and responded to each statement using a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*). Sample items included: "I

try to be loving towards myself when I'm feeling emotional pain" or "When I'm going through a very hard time, I give myself the caring and tenderness I need". Items negatively phrased are reversed coded, and a mean score for each sub-scale is calculated. A total score of self-compassion is determined by adding the means of all six sub-scales together and dividing by six (Neff, 2003b). According to Neff (2003b), this scale has good test-retest reliability ranging from ($r = .80$-$.93$) with high internal consistency ($\alpha = .92$). The Self-Compassion Scale has been used in previous research examining the relationship between self-compassion and health behaviours (Dunne et al., 2016; Sirois, & Hirsch, 2018; Sirois et al., 2015a) and among people with chronic diseases (Brion et al., 2014; Sirois & Hirsch, 2018), including diabetes (Ventura et al., 2019) and prediabetes (Strachan et al., 2018).

Additional items. To have a better understanding of what helped participants the most during the intervention – specifically what helped them increase their physical activity and helped them cope with being diagnosed with prediabetes – a 2-item measure designed specifically for this study was used. Participants were asked at intervention-end "What part of the intervention helped you the most when trying to increase your physical activity?" and "What part of the intervention helped you the most when trying to cope with your prediabetes diagnosis?". This was an open-ended question so that participants were able to indicate which aspects of the intervention were helpful (See Appendix E.5)

To see if participants were receiving co-intervention, a 1-item measure designed specifically for this study asked participants if they were receiving other intervention information beyond the current intervention. Therefore, at intervention-end participants were asked to respond yes or no to the following question: "At any point throughout this intervention, did you enroll in any education programs, other than this one, to help you become more physically active

or to address your prediabetes?" If they responded yes, they were asked to please specify (See Appendix E.6).

Appendix E.1: Negative Affect Scale (relative to prediabetes experience)

(Leary, Tate, Adams, Allen, & Hancock, 2007)

When you think back to how you felt after hearing about your risk to type 2 diabetes please indicate the extent to which you experienced each emotion. Please read each question carefully. To the left of each item, indicate to what extent did you feel each emotion using the following scale:

1(Not at all) ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 (Extremely)

____ 1. After hearing about your type 2 diabetes risk, to what degree did you feel **sad**?
____ 2. After hearing about your type 2 diabetes risk, to what degree did you feel **dejected**?
____ 3. After hearing about your type 2 diabetes risk, to what degree did you feel **down**?
____ 4. After hearing about your type 2 diabetes risk, to what degree did you feel **depressed**?
____ 5. After hearing about your type 2 diabetes risk, to what degree did you feel **nervous**?
____ 6. After hearing about your type 2 diabetes risk, to what degree did you feel **tense**?
____ 7. After hearing about your type 2 diabetes risk, to what degree did you feel **worried**?
____ 8. After hearing about your type 2 diabetes risk, to what degree did you feel **anxious**?
____ 9. After hearing about your type 2 diabetes risk, to what degree did you feel **angry**?
____ 10. After hearing about your type 2 diabetes risk, to what degree did you feel **irritated**?
____ 11. After hearing about your type 2 diabetes risk, to what degree did you feel **mad**?
____ 12. After hearing about your type 2 diabetes risk, to what degree did you feel **hostile**?
____ 13. After hearing about your type 2 diabetes risk, to what degree did you feel **embarrassed**?
____ 14. After hearing about your type 2 diabetes risk, to what degree did you feel **humiliated**?
____ 15. After hearing about your type 2 diabetes risk, to what degree did you feel **disgraced**?
____ 16. After hearing about your type 2 diabetes risk, to what degree did you feel **ashamed**?
____ 17. After hearing about your type 2 diabetes risk, to what degree did you feel **incompetent**?
____ 18. After hearing about your type 2 diabetes risk, to what degree did you feel **worthless**?
____ 19. After hearing about your type 2 diabetes risk, to what degree did you feel **stupid**?
____ 20. After hearing about your type 2 diabetes risk, to what degree did you feel **self-conscious?**

Appendix E.2: Negative Affect Scale (relative to physical activity engagement)

(Leary, Tate, Adams, Allen, & Hancock, 2007)

When you think back to how you felt when you engaged in physical activity please indicate the extent to which you experienced each emotion. Please read each question carefully. To the left of each item, indicate to what extent did you feel each emotion using the following scale:

1(Not at all) ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7 (Extremely)

____ 1. When thinking about my engagement in physical activity, to what degree did you feel **sad**?
____ 2. When thinking about my engagement in physical activity, to what degree did you feel **dejected**?
____ 3. When thinking about my engagement in physical activity, to what degree did you feel **down**?
____ 4. When thinking about my engagement in physical activity, to what degree did you feel **depressed**?
____ 5. When thinking about my engagement in physical activity, to what degree did you feel **nervous**?
____ 6. When thinking about my engagement in physical activity, to what degree did you feel **tense**?
____ 7. When thinking about my engagement in physical activity, to what degree did you feel **worried**?
____ 8. When thinking about my engagement in physical activity, to what degree did you feel **anxious**?
____ 9. When thinking about my engagement in physical activity, to what degree did you feel **angry**?
____ 10. When thinking about my engagement in physical activity, to what degree did you feel **irritated**?
____ 11. When thinking about my engagement in physical activity, to what degree did you feel **mad**?
____ 12. When thinking about my engagement in physical activity, to what degree did you feel **hostile**?
____ 13. When thinking about my engagement in physical activity, to what degree did you feel **embarrassed**?
____ 14. When thinking about my engagement in physical activity, to what degree did you feel **humiliated**?
____ 15. When thinking about my engagement in physical activity, to what degree did you feel **disgraced**?
____ 16. When thinking about my engagement in physical activity, to what degree did you feel **ashamed**?
____ 17. When thinking about my engagement in physical activity, to what degree did you feel **incompetent**?
____ 18. When thinking about my engagement in physical activity, to what degree did you feel **worthless**?
____ 19. When thinking about my engagement in physical activity, to what degree did you feel

stupid?
____ 20. When thinking about my engagement in physical activity, to what degree did you feel **self-conscious?**

Appendix E.3: PASR-12

(Umstattd, Motl, Wilcox, Saunders, & Watford, 2009).

1 = Never **2** = Rarely **3** = Sometimes **4** = Often **5** = Very Often

1. I mentally kept track of my physical activity
2. I mentally noted specific things that helped me be active
3. I set short term goals for how often I am active
4. I set physical activity goals that focused on my health
5. I asked someone for physical activity advice or demonstration
6. I asked a physical activity expert or health professional for physical activity advice or demonstration
7. After physical activity, I focused on how good it felt
8. I reminded myself of physical activity health benefits
9. I mentally scheduled specific times for physical activity
10. I rearranged my schedule to ensure I had time for physical activity
11. I purposely planned ways to do physical activity when on trips away from home
12. I purposely planned ways to do physical activity in bad weather

Appendix E.4: Exercise Barriers Scale

Sechrist, Walker, & Pender (1987)

Below are statements that relate to ideas about exercise. Please indicate the degree to which you agree or disagree with the statements by circling SA for strongly agree, A for agree, D for disagree, or SD
for strongly disagree.

1 = Strongly Disagree 2 = Agree 3 = Disagree 4 = Strongly Disagree

___1. Exercising takes too much of my time.
___2. Exercise tires me.
___3. Places for me to exercise are too far away
___4. I am too embarrassed to exercise
___5. It costs too much to exercise
___6. Exercise facilities do not have convenient schedules for me
___7. I am fatigued by exercise
___8. My spouse (or significant other) does not encourage exercising
___9. Exercise takes too much time from family relationships
___10. I think people in exercise clothes look funny
___11. My family members do not encourage me to exercise
___12. Exercise takes too much time from my family responsibilities
___13. Exercise is hard work for me.
___14. There are too few places for me to exercise

Appendix E.5: Additional items (what helped)

1. “What part of the intervention helped you the most when trying to increase your physical activity?”

_____
_____
_____
_____

2. What part of the intervention helped you the most when trying to cope with your prediabetes diagnosis?

_____
_____
_____
_____

Appendix E.6: Additional items (co-intervention)

1. At any point throughout this intervention, did you enroll in any education programs, other than this one, to help you become more physically active or to address your prediabetes?

Yes
No

2. If yes, please specify.

_____
_____
_____

Appendix F: Exit-Interview for Session Facilitators

Thank you for all of your hard work facilitating the sessions and now taking the time to provide us with some feedback on how the sessions went.

We sent you the consent form that you completed which indicated that I have your permission (or not) to audio record our conversation.
Are you still ok with me recording (or not) our conversation today? ___Yes ___No

If yes: Thank you! Please let me know if at any point you want me to turn off the recorder or keep something you said off the record.
If no: Thank you for letting me know. I will only take notes of our conversation.

Although mentioned on the consent form, I would like to remind you that:

- Your name will not be used
- There are no right or wrong answers
- You do not have to answer any questions you do not want to answer
- If you have additional thoughts or questions after the interview, please do not hesitate to contact me via phone or email. You'll have the opportunity to review your transcript for accuracy and modify or remove anything you choose.
    - Is this something you're interested in doing?
    - ___Yes ____No

Before we begin the interview, do you have any questions? [Discuss questions]

Okay great! Let's get started.

1. What was your overall impression of leading the online sessions?
2. "Which, if any, in-class intervention/control activities did participants get the most engaged with?"
3. "Which, if any, in-class intervention/control activities did not elicit participant engagement?"
4. Please explain whether the intervention/control sessions remained in the allotted class time
    a. PROMPT: (if they went over) Please explain what parts of the group session took longer than expected
5. Please explain participants' feedback, if any, on the home practice activities.
6. Please describe the participant's openness to self-compassion/health topics? (i.e., did they seem interested in learning about self-compassion/the health topics, can you describe some of the concerns the participants had with using a self-compassionate approach (if

any)/learning about the health topics, can you explain some of the benefits the participants had with using a self-compassionate approach/learning about the health topics (if any))

7. "Are there any other comments/suggestions for future self-compassion interventions that you would like to comment on?"

Thank you for allowing me to ask you all of these questions today and thank you for being so open in sharing your experience with me. Receiving your feedback is a vital component of our study so that we can work on improving it for the future trial.

Appendix G: Exit-Interview Questions

Open-ended Questionnaire Assessing Acceptability of Intervention

Hello, my name is _____ and I am the research assistant that will be interviewing you today!

Now, before we get started on the actual questions and formal interview process, I know we've communicated a lot over email the past few months, but It would be really nice to learn a bit more about you! Can you tell me a little bit about yourself?

- Age, occupation, family/social life
- What do you like to do in your spare time?

First, I just want to thank you once again for being willing to participate in the interview aspect of the MOVE IT study. As we have mentioned to you before, this study is to compare the effectiveness of two educational sessions both designed to help people living with prediabetes increase their physical activity. This was a test-run to see if we can implement this same study on a larger scale. Therefore, the aim of this exit-interview is to document your thoughts and feelings regarding your experience in the MOVE IT study.

Our interview today will last approximately one hour during which I will be asking you about your thoughts about different components of this study.

We sent you the consent form that you completed which indicated that I have your permission (or not) to audio record our conversation.
Are you still ok with me recording (or not) our conversation today? ___Yes ___No
If yes: Thank you! Please let me know if at any point you want me to turn off the recorder or keep something you said off the record. However, I will remind you that anything that you do say in this interview will not be linked to your name.

If no: Thank you for letting me know. I will only take notes of our conversation.

Although mentioned on the consent form, I would like to remind you that:

- Your name will not be used and instead we will be using a pseudo (pretend) name
- There are no right or wrong answers
- You do not have to answer any questions you do not want to answer
- If you have additional thoughts or questions after the interview, please do not hesitate to contact me via phone or email.
- You'll also have the opportunity to review your transcript for accuracy and modify or remove anything you choose, if you would like. Is this something you would like to do?
    - If yes: you can expect to receive your transcribed interview in the next 2-3 weeks.

Before we begin the interview, do you have any questions? [Discuss questions]

If any questions (or other questions) arise during the interview, you can feel free to ask them at any time. I would be more than happy to answer your questions.

Now I would like to talk to you a bit about the **online sessions** you attended. Please make sure you are honest in your answers - this information is extremely useful to us and can be used to guide future physical activity classes.

1. How did you first hear about the MOVE IT study?
2. What was your overall impression of the intervention?
3. What are your thoughts about the *number* of group sessions that were part of this study?
    a. Follow-up: Please explain whether you thought the number of online group sessions was manageable, wanted more? Less?
    b. Please explain your thoughts on the first one-on-one meeting?
    PROMT: Was it helpful or useful to you?
4. What are your thoughts about the *time of day* of the group sessions?
    a. PROMPT: please explain whether you had trouble attending the session on time, would a different time work better for you (if so, when)?
5. Please explain what your thoughts are about the *length of each session* (i.e. too long, too short, just right).
6. Please explain your experience with being involved in the group sessions through Zoom relative to meeting in person (if that was possible).
    a. PROMPT: Technical difficulties?, Benefits?, Drawbacks?
7. Please explain which topics, if any, you enjoyed learning about the most?
8. Please explain which topics, if any, you disliked learning about?
9. Please explain whether you felt like the topics covered helped you increase your physical activity levels.
    a. PROMPTS: What activities were the most helpful? Least helpful?
10. Please explain whether there was anything that could have helped you to further increase your physical activity that was not included in the group sessions?
11. Please explain any other benefits you gained from participating in the MOVE IT Study.
12. Please explain whether there was anything in the group sessions that made you feel comfortable, welcomed, or connected to the group.
    a. PROMTS: facilitator, topics, discussions, activities.
13. Please explain whether there was anything in the group sessions that made you feel uncomfortable, either physically or emotionally.
    a. PROMPTS: Topics, discussions, homepractice, worksheet activities.

During each class, the facilitator had you complete **in-class activities** in your workbook. I am going to ask you a couple questions specifically related to these activities.

14. What was your overall impression of the in-class activities?
    a. PROMPT: Helpful/not helpful – why or why not.

    Please explain which workbook activity, if any, you enjoyed completing the most?
    Please explain which workbook activity, if any, you found not helpful/enjoyable.

15. Throughout the 5 weeks of classes, can you please explain whether if at any point you referred to your workbook on non-class days in order to help you increase your PA?
16. Throughout the last couple of weeks since the group sessions ended, please comment on whether or not you have referred back to your notes in the workbook to help you stay on track with your physical activity goals?

Wonderful! Thank you for answering those questions. Next, I am just going to ask you a few questions about the **home-practice**. Put some questions below.

1. What was your overall impression of the home practice activities that you were given?
    a) PROMPT: Helpful/not helpful – why or why not.
    b) PROMPT: Too much/too little

   Please explain which homepractice, if any, you enjoyed completing the most.
   Please explain which homepractice, if any, you found least enjoyable/helpful/relevant.
2. Can you explain whether it was easy or difficult to complete the homepractice activities.
    a) PROMPT: How much homepractice activities would you say you completed?
3. At the beginning of the study, we provided you with different resources that may be beneficial for you to review. For example, we provided you with a website that provided you with additional information about the topics covered in class. Please explain whether you used any of these resources.
    a) PROMPT: if you did/did not – please explain why.

Great. Thank you very much. We are going to switch gears a bit now and talk about the **online questionnaires** you completed before and after the intervention (as well as you will be completing at the 6 and 12 week follow-up time points).

1. What was your overall impression of the online questionnaires?
2. How long, on average, did it take you to complete the online questionnaires?
3. How do you feel about the length of time it took to complete the questionnaires?
4. Please explain whether you had any troubles accessing and/or filling out the questionnaires?

The next topic we are going to discuss is about the **text messaging system**. As we mentioned in the beginning of the study, this is our first time piloting this system and so we are open to any feedback (positive or negative) you have.

1. What are your general thoughts about the text messaging system used as part of the MOVE IT study?
2. What are your thoughts about the *number* of texts received?
3. Please explain whether you thought the texts messages throughout the study were helpful/not helpful to you.
    a. If applicable, please explain how these texts were helpful to you during the study.
    b. If applicable, please explain why these texts were not helpful to you during the study.

Now I would like to ask you a few questions about the **accelerometer** (the red device that sat on your right hip and tracked your movement throughout the day) that you wore both before the study and after the group sessions (*remember not all participants wore them – so only ask this for those who did).

1. Please explain how you felt about having to wear it for the 8 days?
2. Did you have any difficulty remembering to put it on?

   a. If so, please explain
3. Please explain whether the accelerometer tracking sheet was understandable to you and whether or not you had any troubles filling it out?
4. Please explain whether you had any difficulties remembering to put the accelerometer on in the morning
5. Are there any other thoughts, feelings or general comments about the study that you would like to share before we complete today's interview?

Great – Thank you so much for allowing me to ask you all of these questions today and thank you for being so open in sharing your experience with me. Receiving your feedback is a vital component of our study so that we can work on improving it for the future trial.

Appendix H: Checklist for Assessing Facilitator Sessions

Name of facilitator: _____ Name of PI: _____

Note for PI: Please **review session slides before** watching session and **record time** of session.

Rate each item using the following scale:

1 = Very Poor **2** **3** **4** **5** = Exceptional

Presentation & Communication skills:	
Did the facilitator make eye contact with participants? (i.e., did not read from notes or look down lots)	
Did the facilitator have acceptable pace when talking? (i.e., did not talk too fast/too slow)	
Did the facilitator use a natural and conversational tone? OR did they sound scripted/unnatural?	
Did the facilitator have good tone when speaking? (i.e., gives emphasis on certain points, cheerful, confident, etc.)	
Did the facilitator encourage and assist group discussion and participation during group activities	
Adherence to planned intervention:	
Were all in-class activities that were planned for today's session completed?	
Did the instructor cover all slides and topics intended for today's session?	
Was the session under 1 hour and 30 minutes?	

Total score:

Additional Comments:

Appendix I: Facilitator Checklist

Name of facilitator: _____

Note for Facilitator: Please fill this checklist out after each session & ***record time of session***

Rate each item using the following scale:

Adherence to planned intervention:	Please provide a ☒ ☑
Did you complete all the slides in today's session?	
Did you cover all topics?	
Did you complete the session within the allocated time (i.e., 60-90 minutes)	
Did you complete all in-class activities and discussions?	

Additional Comments: