UNDERSTANDING AND TESTING THE LINK BETWEEN MOTIVATIONAL INTERVIEWING AND SELF-COMPASSION THROUGH PHYSICAL ACTIVITY COUNSELLING

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Table of Contents

Abstract

Background: Motivational Interviewing (MI) is an accepting and compassionate collaborative counselling style that has been linked with various desirable client outcomes. However, its association with self-compassion (SC), an important psychological resource is unknown. One context in which this relationship can be studied is in Physical Activity Counselling (PAC), which is an MI-based intervention that has been found to enhance motivation towards physical activity (PA) and PA behaviour, as well as reduce depressive symptoms. However, no hypothesized link has ever been made between MI and SC and no research has been done on the impact of MI-based PAC onto SC or has investigated SC's relationship with PA within PAC.

Purpose: *Article 1*: To explore the link between MI and SC. *Article 2:* To test this proposed association by investigating the impact of a MI-based intervention, specifically through PAC, over time on (1) self-compassion and its subcomponents, and (2) PA and its intensities. A third and fourth purpose were to (3) examine whether any improvements in SC or PA variables were continued at 1-month follow-up and lastly, (4) study the relationships between SC and PA variables over time in university students and employees receiving PAC.

Methods: *Article 1:* This article was a commentary paper that rationalized the hypothesized link between MI and SC. *Article 2*: This article reports results from a study which used a repeated-measures experimental study design, whereby forty university students and employees filled out online validated self-report questionnaires assessing SC and PA before (baseline), immediately after (endpoint), and 1-month after (follow-up) receiving individualized PAC sessions. Participants reached out to PAC mostly on their

own or were referred by other programs on campus. Fidelity checks showed that PAC counsellors were accepting and compassionate.

Results: *Article 1:* A hypothesized link was made between MI and SC, such that the accepting and compassionate spirit of MI, as well as certain content-based techniques used within could help to foster a self-compassionate mindset within the receivers of MI. *Article 2*: Paired-samples t-tests and multivariate analysis of variance tests revealed that there were significant moderate-to-large increases in total SC, self-kindness, and total, moderate, and strenuous PA from baseline to endpoint. There was also a significant large effect for decreases in self-judgement and isolation from baseline to endpoint. All changes appeared to be continued at 1-month follow-up. Lastly, results revealed that common humanity at baseline positively influenced moderate PA at endpoint.

Conclusion: This provides a strong case for the link between MI and SC and provides preliminary evidence to support the positive impact of MI, specifically through PAC, onto SC and PA variables, as well as their relationship over time. Future research is recommended in order to ascertain these findings and practitioners are encouraged to show high acceptance and compassion while assisting individuals with PA behaviour change.

Chapter I: Introduction

Physical inactivity is a leading modifiable risk factor for death and non-communicable diseases, such as hypertension and diabetes (Booth et al., 2017; González et al., 2017). Globally, 28% of the adult population fail to meet the recommended guidelines of 150 minutes of moderate-to-vigorous physical activity per week (World Health Organization, 2018), and in Canada the proportion is even higher being 84% of adults (Statistics Canada, 2017). This is concerning, as regular physical activity has a considerable positive impact on both physical and mental health and has the potential to reduce significant health care costs (Ding et al., 2017; García-Hermoso et al., 2019; Wiese et al., 2017).

One intervention that aims to address this problem, and that has been shown to effectively increase physical activity, is Physical Activity Counselling (PAC; Fortier et al., 2007a, 2011a; Gao et al., 2016). Previous research has revealed that PAC also promotes quality and quantity of motivation (Fortier et al., 2007b, 2011b; Sweet et al., 2014), as well as reduced depressive symptoms in female undergraduate students (McFadden et al., 2017). Contributing to its effectiveness, PAC utilizes Motivational Interviewing (MI; Miller & Rollnick, 2013), a collaborative counselling style that aims to facilitate behaviour change through various techniques. There is ample evidence that MI is effective for increasing physical activity behaviour (Frost et al., 2018; Samdal et al., 2017). However, the impact of MI, and specifically PAC, on other psychological variables and their respective relationship with physical activity is understudied.

One such variable is *self-compassion*, defined as a healthy conceptualization and attitude towards the self (Neff, 2003a). Self-compassion is composed of three mutually distinct but interacting components, including (with their counterparts): 1) *self-kindness*

(vs. self-judgement): having a gentle, rather than judgemental attitude towards oneself; 2) *mindfulnes*s (vs. over-identification): having a balance awareness of one's thoughts and emotions, rather than over-identifying with them; and 3) *common humanity* (vs. isolation): understanding that suffering is part of being human rather than feeling isolated in one's experiences.

Self-compassion is associated with a myriad of psychological benefits, such as increased happiness and optimism, and reduced depression, stress, and anxiety (Germer & Neff, 2019; Zessin et al., 2015). The link has also been made between self-compassion and physical activity behaviour, such that self-compassionate individuals are more likely to be proactive when it comes to their health (Akin, 2014; Magnus et al., 2010) and will more effectively respond to physical activity related setbacks and failures (Ceccarelli et al., 2019; Semenchuk et al., 2018). Despite preliminary evidence on self-compassion and physical activity, more research is recommended on this link (Biber & Ellis, 2017). Moreover, understanding their association in different contexts is necessary, especially in PAC where increasing physical activity is the primary goal. In addition, no studies, to our knowledge, have examined the association between the subcomponents of self-compassion and physical activity (total and intensity) over time. These are some of the objectives of this dissertation.

Importantly, self-compassion is a modifiable construct and can be improved through self-compassion based interventions (Ferarri et al., 2019; Wilson et al., 2018). However, the role of other accepting and compassionate interventions, such as Motivational Interviewing, onto self-compassion is unknown. Therefore, the first purpose of this dissertation was to conceptually explore the link between MI and self-compassion (Article 1), then to conduct an experimental study to empirically test the impact of MI via

PAC on campus[1], onto self-compassion and its subcomponents in university students and employees (Article 2). In addition, this dissertation also extended previous research surrounding the effect of PAC over time on physical activity (total and intensity; Article 2). Finally, as previously mentioned, this study set out to investigate the relationship between self-compassion and physical activity variables over time within participants receiving PAC (Article 2).

This dissertation is significant, as it will address many gaps in the literature, such as being the first to make a strong case for MI and self-compassion, then to test it with an experimental study. In addition, Article 2 will be the first study to examine the impact of PAC onto the subcomponents of self-compassion and physical activity intensity, and to examine their relationships over time.

This dissertation will first present a review of the recent literature surrounding this topic (Chapter II). Following this, the two articles will be presented (Chapter III). Article 1 has been accepted into the *Journal of Counselling and Psychotherapy.* Article 2 has been prepared for submission to the *Journal of Contextual Behavioural Science.* Following the articles, an overall discussion (Chapter IV) will be presented.

[1] Developed from PAC the trial conducted in primary care (Fortier et al., 2007a, 2011a), the PAC on campus program was created at a Canadian university and consists of University students picked from the PAC class who counsel University students and employees for free. This was the program used in this dissertation and will herein be referred to as PAC (except in Chapter II and IV when the results are presented related to the trial versus the program.

Chapter II: Literature Review

The benefits of physical activity on psychological and physical health have been established incontrovertibly (Carr et al., 2018; Choi et al., 2019). Indeed, research has shown that regular engagement in physical activity reduces the risk of developing some types of cancer, osteoporosis, obesity, and high blood pressure (González et al., 2017; Tarp et al., 2019). Meta-analyses have also concluded that regular physical activity behaviour is associated with reduced depressive symptoms, stress, and anxiety, as well as increased positive affect, life satisfaction, and subjective well-being (Schuch et al., 2017; Wiese et al., 2017). However, despite consistent attention and recommendation, 1 in 4 adults fail to meet the recommended physical activity guidelines of 150 minutes of moderate-to-vigorous physical activity per week (World Health Organization, 2018).

To address the prevalence of physical inactivity and reduce significant economic burden on the health care system, which is estimated at billions of dollars annually (Ding et al., 2017), numerous evidence-based behaviour change interventions aimed at increasing physical activity levels have emerged (e.g., Lambert et al., 2017; Murray et al., 2017). Moreover, researchers have sought out to examine what contributes to the effectiveness of such interventions in order to further understand and replicate those interventions (Bernard et al., 2016). Many studies have concluded that interventions based on Motivational Interviewing (MI) are effective in promoting physical activity (Fortier et al., 2011a; McFadden et al., 2017; Wade et al., 2018) and recent systematic reviews and a meta-analysis support this (Frost et al., 2018; O'Hallaron et al., 2014; Samdal et al., 2017). One intervention that utilises MI is Physical Activity Counselling (PAC; Fortier et al., 2007a), which has shown to motivate individuals for their own reasons and increase their physical activity levels (Gao et al., 2016; McFadden et al., 2017; Sweet et al., 2014).

Motivational Interviewing and Physical Activity Counselling

Motivational interviewing (MI) is a collaborative counselling style aimed at strengthening an individual's own motivation and commitment to change. MI is composed of four phases: 1) *Engaging:* establishing a helpful connection and working relationship 2) *Focusing:* developing and maintaining a specific direction in conversation about change 3) *Evoking:* eliciting the client's own motivation for change, and 4) *Planning:* making a commitment to change and formulating a plan of action (Miller & Rollnick, 2013). The length and time spent in each phase depended on the client's needs and willingness to change.

Motivational Interviewing Techniques

In order to further understand the effectiveness of MI, Hardcastle et al. (2017) systematically classified and isolated the different techniques of this complex intervention. From this study, these researchers concluded that there are 38 distinct MI techniques, split into two categories: relational (16) and content-based (22). *Relational* techniques deal with the interpersonal style and *how* the content of the intervention is delivered (Hagger & Hardcastle, 2014). The relational techniques are collectively known as the underlying 'spirit' of MI. This spirit is comprised of four key elements, including: 1) *Partnership:* an active, positive collaboration with the client, 2) *Acceptance:* includes absolute worth (prizing the inherent worth of the client), affirmation (to seek and acknowledge the client's strengths and efforts), accurate empathy (an active interest in and effort to understand the client's perspective), autonomy support (honouring and respecting the client's autonomy), 3) *Compassion:* actively promoting the client's welfare and giving priority to the their needs, and lastly 4) *Evocation:* eliciting inner strengths and resources within the client and strengthening them (Miller & Rollnick, 2013).

On the other hand, *content-based* techniques deal with the actual content of the intervention (i.e., *what* is delivered, not *how* it is delivered). For example, a content-based technique that aims to evoke client change is the *importance ruler*, whereby the counsellor seeks to explore readiness to change by asking how significant change is to the client and why their importance number is not lower (Miller & Rollnick, 2013).

A recent systematic review and meta-analysis revealed that MI interventions with high fidelity to relational techniques (i.e., MI spirit) produced larger effects on physical activity behaviour change as opposed to lower fidelity, concluding that the interpersonal style in which MI is delivered is paramount to its efficacy (O'Halloran et al., 2014). While the content-based techniques are important to MI, the intervention can be perceived as manipulative and coercive if they are not employed with the MI spirit. This is supported by research, which has concluded that the spirit of MI was the most consistent element in promoting desirable client outcomes as opposed to other elements, which were present but did not have a consistent effect (Copeland et al., 2015).

Taken together, the abovementioned MI techniques have been helpful in understanding the effectiveness of MI-based interventions. As previously mentioned, one such intervention that is based on MI and that has previously been reliably described by these techniques (Gagnon et al., 2017) is Physical Activity Counselling (PAC). While much research had been conducted on MI, nothing has been written on its possible impact onto self-compassion, an important and influential psychological resource. The first article in this dissertation will examine this potential link, while the second will conduct an experiment to test it empirically, through PAC. First, we will describe in more detail what PAC is and the research that has been found on its effects.

Physical Activity Counselling

Physical Activity Counselling (PAC), having MI at its core, is a behaviour change intervention aiming to promote one's own motivation to engage in physical activity behaviour (Fortier et al., 2007a). There have been a few studies that have examined the effectiveness of PAC interventions in increasing physical activity behaviour. One randomized control trial by Fortier et al. (2007a, 2011a) examined the influence of PAC in a primary health care setting. Participants received either a) a brief 3-minute MI-based intervention regarding physical activity from their physician during a primary care visit or b) an intensive 3-month MI-based physical activity counselling (6 sessions) from a physical activity counsellor. The study revealed that those who received the intensive physical activity counselling had greater self-reported physical activity levels at 6 and 13 weeks compared to those in the brief intervention group (Fortier et al., 2011a).

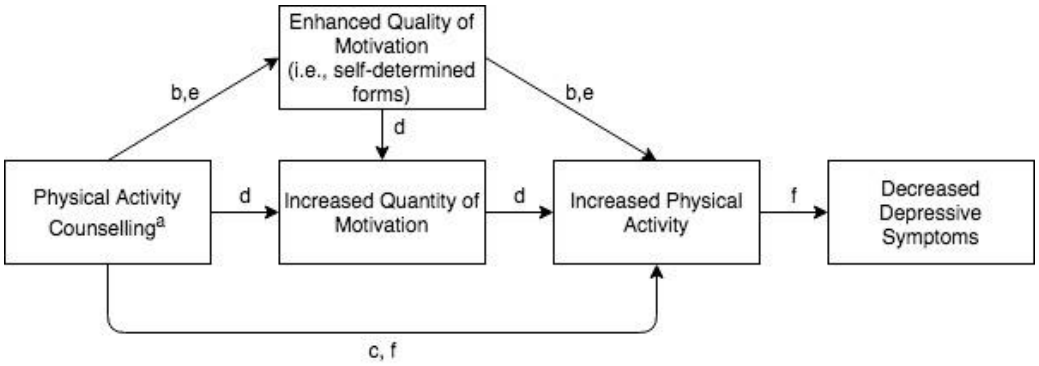
Another study by McFadden et al. (2017) examined the influence of a 2-month PAC on campus intervention in undergraduate female students with depression. Specifically, the study investigated the impact of PAC on physical activity levels and the severity of depressive symptoms at multiple time points. Results revealed that self-reported physical activity increased and depressive symptoms decreased significantly from baseline to endpoint. These results are important as they provide initial support for the role of PAC as a potential intervention to promote physical activity in undergraduate students, and suggest that PAC may also offer psychological benefits. This dissertation, and specifically Article 2, will further contribute to this body of literature by examining the effects of PAC on self-compassion, its subcomponents, physical activity, and physical activity intensity in both male and female undergraduate students and in employees on campus.

In order to examine *how* PAC increases physical activity, Fortier et al. (2007b) investigated the impact of PAC on the quality (i.e., self-determined forms) of motivation. This article showed that those receiving PAC had higher levels of self-determined motivation for physical activity mid-intervention, which transferred into higher levels of physical activity at the end of the intervention than those who did not receive the intensive counselling. In order to further analyze mechanisms of change, Fortier et al. (2011b) found that self-determined physical activity motivation moderated the mediated influence of quantity of physical activity motivation on the relationship between the intervention and physical activity in the PAC trial.

Further, Sweet et al. (2014) examined, through hierarchical linear modelling, the association between different forms of motivational regulations as they related to changes in physical activity using the PAC trial data. They found that greater levels of identified regulation and intrinsic motivation were related with physical activity change over time, thus concluding that interventions should aim at fostering self-determined forms of motivations. The contributions from these articles have helped to deepen our understanding of motivation (quantity and quality) as a specific factor underlying PAC. See Figure 1 for a conceptual diagram of the abovementioned variables that have been previously identified within PAC.

Figure 1.

A conceptual diagram of the variables that have been previously identified within PAC, with respective references.



Note. [a] Fortier et al. (2007a) , [b] Fortier et al.(2007b), [c] Fortier et al. (2011a), [d] Fortier et al. (2011b), [e] Sweet et al. (2014), [f] McFadden et al. (2017)

In summary, PAC has demonstrated promising effectiveness in increasing quality and quantity of physical activity motivation and decreasing depressive symptoms. Additional randomized controlled trials have supported this and have shown a positive short to mid-term effect of PAC on patients' physical activity motivation, physical activity levels, and various health indicators such as body fat percentage (Bouchard et al., 2012; Gao et al., 2016). As a result, PAC is being recommended by national public guidelines and health promotion agencies around the world (National Institute for Health and Care Excellence, 2013; Office of Disease Prevention and Health Promotion, 2020). However, there remains a lack of knowledge surrounding other potential factors that may underlie the effect of PAC, such as self-compassion. Therefore, this dissertation will make a strong case for the link between MI and self-compassion (Article 1), and experimentally test the impact of MI via PAC onto self-compassion (Article 2).

Self-Compassion

Self-compassion involves being open and connected to one's own suffering, while having the desire to alleviate it with kindness, all while understanding that their suffering

is part of the larger human experience (Neff & Germer, 2017). There are three conceptually distinct, interacting factors of self-compassion, including the following: 1) *Self-kindness* (vs. self-judgement), which involves meeting one's thoughts and emotions with care and gentleness rather than criticism and judgement, 2) *Mindfulness* (vs. over-identification), which involves having a clear and balanced awareness of one's thoughts and emotions without ruminations or over-identification with emotions or thoughts, and 3) *Common humanity* (vs. isolation), which is the recognition of the universality, rather than the uniqueness of human imperfection and suffering (Neff, 2003a).

Essentially, self-compassion represents a balance between increased positive and decreased negative self-responding to personal struggle (Neff et al., 2018). Systematic reviews and meta-analyses have concluded that self-compassion is a strong predictor of positive psychological health, emotional intelligence, interpersonal functioning, positive self-concept, body image, and decreased psychopathology (Neff et al., 2018; Ferarri et al., 2019; Zessin et al., 2015). The research between self-compassion and well-being is numerous, however its association with physical activity behaviour is more sparse.

Self-Compassion and Physical Activity

Previous studies have provided evidence for self-compassion as a predictor of general health-promoting behaviours (Miller & Strachan, 2020; Semenchuk et al., 2020). In fact, a recent study by Gedik (2019) showed that self-compassion was linked to increased health-promoting lifestyle behaviours, including physical activity, in a sample of college students. There are two common mechanisms that have been demonstrated to describe how self-compassion is associated with physical activity. The first describes self-compassion's role in facilitating proactivity related to health and promoting self-determined forms of motivation for health-promoting behaviours, such as physical activity

(Akin, 2014; Magnus et al., 2010; Sirois & Hirsch, 2018). This is important, as more self-determined forms of motivation have been linked to behavioural maintenance, psychological well-being, and goal achievement (Deci & Ryan, 2000; Teixeira et al., 2012). In addition, self-compassion has been associated with enhanced self-regulatory abilities such as self-monitoring, goal setting, taking action, and emotional regulation (Terry & Leary, 2011; Terry & Leary, 2013), all which help to initiate and maintain physical activity over time (Kanejima et al., 2019).

A second way that self-compassion can facilitate physical activity behaviour is through a more reactive approach, such as coping with negative physical activity experiences. A study by Semenchuk et al. (2018) found that women exercisers with higher levels of self-compassion are more effectively able to self-regulate their negative emotions and re-engage their goals following a physical activity setback or failure (i.e., less rumination). Moreover, a recent study by Ceccarelli et al., (2019) found that in a sample of athletes, self-compassion promoted adaptive physiological and psychological responses to sport failure. For example, when faced with a sport failure, these athletes had increased parasympathetic nervous system activity, and reduced maladaptive thoughts, subsequently allowing the individual to relieve negative emotions and move forward in their goal progress.

Biber and Ellis (2017) conducted a meta-analysis on seven studies to examine the effect of self-compassion interventions on health behaviours. They concluded that self-compassion interventions positively impacted health behaviours, with physical activity being one of these behaviours. However, this article only examined one study with physical activity as the primary outcome, as opposed to being grouped with other health behaviours. Clearly, more research on the link between self-compassion and physical activity is needed,

and the authors highlighted this. Moreover, understanding the association between self-compassion and physical activity in different contexts, such as PAC, would be interesting because PAC primarily focuses on increasing physical activity. Finally, there have been no studies, to our knowledge, that have examined the association between the subcomponents of self-compassion and physical activity intensities over time. Therefore, this dissertation is original and will be addressing the abovementioned research gaps.

Self-Compassion Within Physical Activity Counselling

Important for this dissertation, self-compassion is a malleable construct (Brion et al., 2014; Neff & Germer, 2017). Indeed, meta-analyses have shown that it can be enhanced directly through interventions (Ferarri et al., 2019; Wilson et al., 2018). However, no paper, to our knowledge, has highlighted the potential link between MI interventions and self-compassion, nor has any research experimentally examined the impact of a MI-based intervention such as PAC on self-compassion. This dissertation will do both in Article 1 and 2, respectively. Moreover, this study will provide an explanation for examining another important psychological factor that might influence physical activity within PAC, beyond motivation that could explain changes in physical activity within PAC. Therefore, the overall purposes of this dissertation were as follows:

Article 1

(1) To explore the link between Motivational Interviewing (MI) and self-compassion.

Article 2

(2) To investigate the impact of MI-based Physical Activity Counselling (PAC) on levels of self-compassion (primary outcome) and physical activity (secondary outcome) in university students and employees and the relationship between these

variables over the course of PAC. The specific objectives and hypotheses of the study were as follows:

a. Examine the effect of PAC on total self-compassion, and its 6 subcomponents, from baseline to endpoint. It was hypothesized that PAC would lead to an increase in total self-compassion from baseline to endpoint (Biber & Ellis, 2017; Pastore & Fortier, in press). It was also hypothesized that PAC would lead to an increase in the positive subcomponents (self-kindness, mindfulness, and common humanity), and conversely a decrease in the negative subcomponents (self-judgement, over-identification, and isolation) from baseline to endpoint.
b. Examine the effect of PAC on total physical activity, and its 2 intensities (i.e., moderate, and strenuous), from baseline to endpoint. Based on previous research, it was hypothesized that PAC would lead to an increase in total physical activity from baseline to endpoint (Fortier et al., 2011a; McFadden et al., 2017). As this is the first study to explore the impact of PAC on physical activity intensity, there was no hypothesis for this research question.
c. Examine if any improvements in self-compassion and/or physical activity were continued at 1-month follow-up. Based on previous studies that showed that self-compassion gains remained stable following self-compassion based interventions (Biber & Ellis, 2017; Ferrari et al., 2019), it was hypothesized that improvements in self-compassion would be continued at 1-month follow-up. It was also predicted that improvements in physical activity would be continued at follow-up (Gao et al., 2016; McFadden et al., 2017).
d. Investigate the relationship between self-compassion and physical activity variables over time from baseline to endpoint and endpoint to follow-up. Based

on previous research, it was hypothesized that baseline levels of total self-compassion would be positively correlated with total physical activity at endpoint and that higher levels of total self-compassion at endpoint would be positively associated with total physical activity at 1-month follow-up (Biber & Ellis, 2017; Horan & Taylor, 2018). Regarding the relationship between the subcomponents of self-compassion and total physical activity, the research is inconclusive, therefore there was no hypothesis for this research question. Lastly, since this is the first study to examine the relationships between the subcomponents of self-compassion and the physical activity intensities, there was no hypothesis for this research question. `

Chapter III: Journal Articles

Article 1: Understanding the Link Between Motivational Interviewing and Self-Compassion

The following article provides a solid case for the convergence between Motivational Interviewing (MI), a well-used and empirically supported counselling style, and self-compassion (SC), an important and positive psychological variable that has been linked to many health benefits. This article provides an extensive description of the process by which MI can help to cultivate SC in clients receiving MI, laying a strong foundation for Article 2. This article has been accepted to the *Journal of Counselling and Psychotherapy*, which welcomes commentaries that innovatively integrate counselling concepts.

Article 2: Investigating the Impact of Physical Activity Counselling on Self-Compassion and Physical Activity Levels, and Their Associations Over Time

The following article reports finding from an experimental study that investigated the impact of MI, specifically through Physical Activity Counselling (PAC), onto SC and its subcomponents, and physical activity and its intensities. In addition, results are reported on the relationship between these variables in PAC over time.

Understanding the Link Between Motivational Interviewing and Self-Compassion

Abstract

In this article, we posit that the accepting and compassionate spirit of motivational interviewing (MI), along with specific content-based techniques (i.e., reframing), can help to cultivate a self-compassionate mindset within clients receiving MI. We further explore this link, while also discussing potential moderators that may influence this process, as well as practical implications for counselling practice, and future research recommendations. This article is novel in that it could provide a new theoretical foundation for conducting research that supports the effectiveness of MI in enhancing self-compassion, which has been associated with a myriad of improved psychological outcomes. The concepts of this paper and the exploration between specific MI techniques would be valuable to many clinicians with the desire to increase self-compassion in their clients.

Keywords: counselling, relational techniques, content-based techniques

Understanding the Link Between Motivational Interviewing and Self-Compassion

Motivational interviewing (MI) is a collaborative counselling style widely implemented and supported in various counselling domains such as education (Ratanavivan & Ricard, 2018), health care (Lundahl et al., 2013), and career counselling (Rochat & Rossier, 2016). As MI is a complex intervention, multiple techniques aim to evoke motivation and promote change. To elucidate these techniques and help researchers understand the mechanisms underpinning the effects of MI, a list of 38 techniques has been identified (Hardcastle et al., 2017). Of these 38 techniques, 22 are content-based and aim to promote change by focusing on the content of the intervention (e.g., exploring the pros and cons). In contrast, the other 16 are relational techniques (collectively known as the "spirit") and promote change by informing the interpersonal style through which the content-based techniques are delivered (e.g., affirmations). This underlying spirit is central to MI and involves an accepting and compassionate partnership that draws on and evokes the client's inner strengths (Miller & Rollnick, 2013).

Previous research has indicated that the spirit was the most consistent element of MI in promoting client outcomes, and had a direct link with change relative to other elements such as content-based techniques. These were still present but not as consistently associated with these outcomes (Copeland et al., 2015). As Miller and Rollnick (2013) suggested, the *way you are* with clients is more important than *what you say*, however in combination, both aspects of MI are essential for creating an environment in which the client is supported to change and grow.

Indeed, there is growing evidence for the effectiveness of MI in counselling contexts for improving a client's commitment to change towards their desired goal (Lundahl et al., 2013; O'Halloran et al., 2014; Smedslund et al., 2011). For example, a

systematic review found that MI was effective for improving student outcomes such as academic achievement, academic behaviour, and school-based motivation (Snape & Atkinson, 2016). In other contexts, a meta-analysis has reported medium-to-large effects on treatment adherence and small-to-medium effects on treatment outcomes, such as psychological well-being (Lundahl et al., 2010).

In some cases, researchers have also linked MI and other theoretical frameworks, such as self-determination theory (SDT; Deci & Ryan, 2000) and the transtheoretical model (TTM; DiClemente & Prochaska, 1982; Dray & Wade, 2012). Indeed, some studies have highlighted the link between MI and SDT, such that MI provides an autonomy-supportive environment for clients that supports the three psychological needs of SDT (autonomy, competence, and relatedness), promotes self-determination, and enhances client outcomes (Miller & Rollnick, 2012; Resnicow & McMaster, 2012).

As new theoretical constructs arise, new associations with MI should be explored. This would help to understand better the underlying mechanisms involved in MI and to optimize interventions using MI. One such relatively new construct is *self-compassion*, which is defined as a healthy and kind stance towards the self (Neff, 2003a). Those who are self-compassionate are connected and open to their suffering, generating the desire to alleviate it, heal it with kindness, and understand that their suffering is part of the larger human experience (Neff & Germer, 2017). Self-compassion has become increasingly prevalent in research and is used in a variety of interventions due to its significant association with many positive outcomes such as increased psychological health and well-being (Neff et al., 2018), and enhanced coping with stress (Chishima et al., 2018).

It appears that self-compassion may be cultivated through a compassionate therapeutic relationship (Desmond, 2016; Germer, 2012). Thus, it is reasonable to assume

that there exists an important link between MI and self-compassion. As MI has an accepting and compassionate nature, this would likely be transferable to MI clients, subsequently leading to increases in self-compassion. Additionally, specific content-based MI techniques (e.g., normalizing) may work more directly to enhance this process as they align with a self-compassionate mindset.

In this article, we will explore the convergence between MI and self-compassion while also discussing practical counselling implications and future research. Having a counselling style that can help to change a client's behaviour and help them have a healthier stance towards themselves could offer many benefits. We also provide a case study to illustrate a practical example of the various ways in which a counsellor using MI could foster a self-compassionate mindset within their client.

A Brief Overview of Motivational Interviewing and Self-Compassion

Motivational Interviewing

Motivational interviewing (MI) is an empirically validated, collaborative counselling approach that helps strengthen a client's motivation and commitment to change (Miller & Rollnick, 2013). The effectiveness of MI relies heavily on its underlying spirit, which creates a supportive and non-judgmental environment rather than manipulative and coercive. This underlying spirit has four components as follows:

1. *Partnership*. An active, positive collaboration with the client.
2. *Acceptance*. Acceptance includes (a) absolute worth, which is prizing the inherent worth of the client with unconditional positive regard; (b) affirmation, which is to seek and acknowledge the client's strengths and efforts; (c) accurate empathy, which is an active interest in and attempt to understand the client's internal

perspective; and (d) autonomy support, which is honouring and respecting the client's autonomy).

3. *Compassion*. Actively promoting the client's welfare and giving priority to their needs.
4. *Evocation*. Eliciting inner strengths and resources within the client and strengthening them (Miller & Rollnick, 2013).

All the abovementioned components are essential to the effectiveness of MI. However, for this paper, more emphasis will be placed on acceptance and compassion, as we believe these likely have a more direct influence on cultivating a client's self-compassion.

The spirit of MI encompasses a range of individual techniques, known as the relational techniques of MI. Additionally, there are also content-based techniques, which differ in overall function. A common example of a relational technique that informs the spirit of MI is a *double-sided reflection*, which is when the counsellor aims to capture client ambivalence by strategically communicating to the client that they heard their reasons for and against change (Hardcastle et al., 2017).

An example of a content-based technique that aims to evoke change talk is the *importance ruler*, whereby the counsellor seeks to explore readiness to change by asking how significant change is to the client and why their importance number is not lower (Miller & Rollnick, 2013). In this article, we suggest that particular content-based techniques of MI (which we will discuss later on), as well as the accepting and compassionate way they are employed (relational techniques or spirit), provide a wholesome environment for change and cultivation of self-compassion.

Self-Compassion

As previously mentioned, self-compassion is a healthy conceptualization and attitude towards the self (Neff, 2003a). Self-compassion is composed of three facets, and their counterparts, including the following:

1. *Self-kindness* (vs. self-judgment), which is the ability to treat oneself with gentleness instead of being judgmental.
2. *Mindfulness* (vs. over-identification), which is the ability to have a balanced and non-reactive awareness of one's thoughts, emotions, and feelings rather than over-identifying with them.
3. *Common humanity* (vs. isolation), which is the understanding that pain and suffering is part of the broader human experience rather than believing that they are isolated in their painful experiences.

Though these components are all necessary for having a self-compassionate mindset, there is a particular order in which they should occur when faced with a struggle (Neff & Germer, 2018). Specifically, mindfulness lies central to self-compassion in that an individual must first notice that they are suffering to give themselves compassion (Neff & Germer, 2017). Once an individual experiences mindfulness in a moment of struggle, they can then say to themselves that what they are experiencing is common (common humanity) and then treat this suffering with self-kindness. For example, after experiencing a setback the individual might say, “I am in a moment of pain” (mindfulness), followed by, “This is a setback that many people experience” (common humanity), and lastly “May I be gentle with myself during this struggle” (self-kindness).

In terms of evidence on the outcomes of self-compassion (as measured by the Self-Compassion Scale; Neff, 2003b) this trait has been found to lead to increased psychological

health (Neff et al., 2018), such as high levels of well-being (see Zessin et al., 2015 for a systematic review) and improved student communication behaviours (Long & Neff, 2018). Self-compassion is a malleable construct that can be enhanced (Leary et al., 2007; Neff & Germer, 2013). Indeed, various types of interventions exist, such as mindful self-compassion, that aim to increase self-compassion (Neff & Germer, 2013) and they have been found to increase optimism, happiness, self-efficacy, and to decrease rumination, depression, and anxiety (Albertson et al., 2014; Neff & Germer, 2013; Smeets et al., 2014). Increasing self-compassion has many positive outcomes. If a widely used counselling style such as MI can enhance it, this may provide many practical benefits, which will be further explored throughout this paper.

Research Linking Motivational Interviewing and Self-Compassion

There have been no studies, to our knowledge, that have examined the impacts of MI on self-compassion. There have been two studies that have investigated them within the same study. For example, Benzo (2013) used and compared two different interventions for promoting self-management in patients with chronic obstructive pulmonary disease, one based on MI counselling and one based on mindfulness (a facet of self-compassion). The interventions were chosen because they both "deeply touch the core of human values to create the condition for change in daily lives from observation and reflection" (Benzo, 2013, p. 176). Both the MI and mindfulness intervention groups reported a common theme of increased levels of awareness of the self and their goals. Though no conclusions can be made about the effects of MI on self-compassion from this study, it is important to note that this increase in awareness (mindfulness) is a central component of self-compassion and provides initial insight into the potential effects of MI on increased client awareness. Even though the two interventions used in this study differ in their mechanisms (e.g., MI

was used to increase motivational components towards certain health behaviours, whereas the mindfulness intervention was used to increase one's non-judgmental attention to the present moment), their outcomes were similar.

In another recent study, Steindl et al. (2018) examined the use of MI as a precursor to enhance outcomes of compassion-based interventions (such as mindful self-compassion), and they found that MI was a promising prelude and had the potential to improve motivation, commitment, and compassionate action towards oneself. Even though this study used MI in a more direct way to increase self-compassionate behaviour (such as directly discussing being self-compassionate with their client), it does demonstrate the malleability of motivation to be self-compassionate. It provides support for enhancing self-compassionate motivation in a counselling context. The abovementioned studies have been influential in recognizing the link between MI and self-compassion, however this paper is the first to explore the rationale and implications for doing so. To further understand this rationale, it is important to delineate the techniques in which MI could lead to increases in self-compassion.

Variables Identified Within Motivational Interviewing

As the popularity of MI has grown, there have been variables that have been proposed to explain the effects of MI on various outcomes such as health behaviour change. One such important factor is self-determination (i.e., engaging in an activity out of enjoyment or because it aligns with personal values; Deci & Ryan, 2017; Fortier et al., 2007). As previously mentioned, MI has been proposed as an ideal context to promote SDT's three psychological needs, which, in turn, leads to increases self-determination and improved behaviour change (e.g., Patrick et al., 2013). Indeed, in the physical activity context, research has shown that many MI-based interventions have been shown to lead to

increased self-determination and physical activity increases (Fortier et al., 2011; Teixeira et al., 2012).

Recent research studies have also shown an association between self-compassion and self-determination (Guertin et al., 2018; Magnus et al., 2010; Mosewich et al., 2011). Though self-determination is an important mediator of MI, the exploration of other potential mediators is warranted to fully understand and optimize counselling interventions. As highlighted in this paper, self-compassion may be a key mediator in the process of MI. Thus, the next section of this paper will further explore this sequence (MI → self-compassion) through the two different types of MI techniques.

Fostering a Self-Compassionate Mindset Through Motivational Interviewing

Using the Spirit of MI (Relational Techniques) to Enhance Self-Compassion

As the spirit is the most consistent MI element that promotes desirable client outcomes (Copeland et al., 2015), we posit that it would likely be the most important for enhancing self-compassion. This is primarily because the spirit of MI changes the conversation from being coercive and manipulative to supportive and non-judgmental. To further understand how the spirit of MI could cultivate self-compassion, it is essential to realize that MI is a collaborative conversation that enables the client to self-explore to find reasons to change. This process naturally allows the counsellor to elicit further change talk that supports the client's personal goals. What is especially important is that during this process, the MI counsellor provides a safe environment for the client by being accepting and compassionate (as expressed through the relational techniques).

Through MI, it is reasonable to assume that the clients would internalize this accepting and compassionate stance towards themselves. Some core examples in which the

counsellor informs the MI spirit through the relational techniques are (a) *affirmations* (which include a counsellor providing a statement that acknowledges the client's difficulties, efforts, and self-worth); (b) *emphasizing autonomy* (which involves the counsellor providing a statement that directly expresses motivational support for the client's own choice and self-determination); and (c) *reflections* (which allow the counsellor to strategically repeat back important things that the client says to evoke change talk; Hardcastle et al., 2017). We strongly believe that the MI spirit alone may cultivate self-compassion. However, for further support, the content-based techniques will also be discussed.

Using the Content-Based Techniques of MI to Enhance Self-Compassion

Content-based techniques function to increase self-compassion in a slightly different and more direct way than the spirit of MI. For example, the MI spirit deals with *how* the counsellor delivers the intervention, whereas the content-based techniques are *what* the conversation entails. Of the 22 content-based techniques identified in MI (Hardcastle et al., 2017), we predict that four may be particularly relevant to fostering self-compassion. These include (a) *identifying past successes* (the counsellor prompts the client to think about previous successes to build confidence for change); (b) *identifying strengths* (the counsellor prompts the client to elicit their strengths); (c) *reframing* (a reflective statement from the counsellor that invites the client to consider a more positive and motivational interpretation of what has been said); and (d) *normalizing* (the counsellor communicates to clients that having difficulties while changing is not uncommon; Hardcastle et al., 2017).

Identifying past successes and strengths would target the self-kindness component of self-compassion as it enables the client to voice positive attributes, thus promoting a

kind stance rather than a judgmental one. We suspect that reframing would target the mindfulness component of self-compassion as it elicits the client to think more positively, thus preventing them from feeling over-identified with negative thoughts or feelings. Finally, normalizing likely targets the common humanity component of self-compassion as it helps the client to understand that their struggles are part of the broader human experience. For a summary of what components of self-compassion, these specific content-based techniques would address, refer to Figure 1. As we have outlined the necessary components that could be involved in the cultivation of self-compassion, it is also important to understand factors that might moderate this process.

INSERT FIGURE 1

Moderating Factors

Though this paper has explored the potential mechanisms through which MI can cultivate self-compassion, there may be moderating factors that can potentially influence this process. One example of a potential moderating factor is the possible discord between the client and their counsellor. Signs of discord include when the client becomes defensive (e.g., blaming, minimalizing, justifying), squares off (e.g., taking an oppositional stance towards their counsellor), interrupts/discounts their counsellor, or seems disengaged from the conversation (Miller & Rollnick, 2013, pp. 228-239). It can also occur if the counsellor's techniques or approach become less consistent with MI (e.g., they seem tired, stressed, or distracted; Miller & Rollnick, 2013, p. 240).

Discord is concerning as it may indicate that there is dissonance in the client-counsellor relationship and is likely inversely related to subsequent change (Miller et al., 1993; Patterson & Chamerlain, 1994; Safran et al., as cited in Miller & Rollnick, 2013). If discord is high between the client and their counsellor, the client is less likely to be engaged

in the conversation. This would reduce the chance of the client internalizing a compassionate mindset. By contrast, if there is less discord in the relationship, the client is likely to be more engaged in the counselling sessions. This would allow them to be more likely to change and internalize a compassionate mindset.

Other potential moderating factors that are likely to compromise the effectiveness of MI in cultivating self-compassion are related to the experience of trauma. For example, greater exposure to trauma is expected to influence one's ability to internalize self-compassion. Research has shown that individual's who have experienced moderate to severe exposure to trauma (e.g., abuse, assault) were less self-compassionate (Barlow et al., 2017; Bistricky et al., 2017), and had increased fear and active resistance towards receiving compassion from others (Gilbert, 2010; Matos et al., 2017) and being self-compassionate (Boykin et al., 2018).

McLean et al. (2018) further illustrate the above findings in their qualitative study that explored the most common barriers for being self-compassionate among sexual abuse survivors. They found that the largest obstacles were having poor relational templates for compassion, negative self-perceptions, fears, resistance, low coping self-efficacy, and misperceptions regarding compassion. Together, these factors made it more difficult for clients to cultivate compassion (McLean et al., 2018).

Therefore, we suggest that it would be increasingly difficult to develop self-compassion in clients who have had greater exposure to trauma. For clients who have had less exposure to trauma, it is likely easier to cultivate self-compassion through MI. It is also important to note that a counsellor's ability to acknowledge and react compassionately to trauma and suffering is critical (McLean et al., 2018). However, as previously

mentioned, acceptance and compassion are at the core of MI. Thus, it is expected that MI-trained counsellors are well equipped to respond authentically to client suffering.

We have explored the association between MI and self-compassion in more detail, as well as outlining potential moderators that may play an important role. We will now provide a case study example to understand more clearly how this process might occur in a real-life context.

Case Example

Case Overview

Erin has been struggling to quit smoking for many years. She has tried multiple times and successfully stopped for three years but has now started again. She tends to be very self-critical, judgmental of her flaws, and overwhelmed with her emotions. She also believes that she is alone in her experiences (essentially low in self-compassion). Erin begins to seek an MI-based counselling service that will help her quit smoking. Below is a conversation from Erin's third counselling session, after a trusting relationship has already been established with her counsellor.

Counsellor	Thanks for showing up to our session today, and you even came early! You're awesome and on top of your game. (affirmation*)
Erin	No problem.
Counsellor	How has the past week been?
Erin	Not the best. I only stuck to my plan for two out of seven days. I don't understand why I can't get this right when everyone else can. I'm a failure. (isolation† and over-identification†)
Counsellor	I see that you're upset that you didn't stick to your plan, and you think that you failed at this attempt. (complex reflection*) What's amazing, though, is the fact that the last time we met, you were smoking every day of the week (reframing*). I know that you're discouraged, and that's not an uncommon emotion when trying to quit smoking (normalizing*). I know you will get through this. You're persistent! (affirmation*)
Erin	I guess you're right. I shouldn't be so hard on myself (self-kindness†), and two days is better than none (mindfulness†). I'll also admit that my other

	friends that are trying to quit have been going through the same thing too (common humanity†).
Counsellor	That's great that you see that (affirmation*). I want to direct our conversation elsewhere now if that's okay.
Erin	That's fine.
Counsellor	What are certain strengths that you see in yourself and that have helped you to succeed in the past, specifically the last time you quit? (identifying strengths and past successes*)
Erin	I'm not really sure. I think a strength of mine is that I was very persistent (self-kindness†). Even when I would smoke one day, I would just want to keep trying and trying.
Counsellor	I'm glad you see that in yourself because I see the exact same thing (affirmation*). That must have really helped you through a tough time (simple reflection).
Erin	Yes, it did.

*MI technique

†Subcomponent of self-compassion

Case Discussion

As you can see in Erin's counselling session, she begins to voice what the counsellor is telling her, and her thoughts begin to align with the three components of self-compassion (i.e., self-kindness, common humanity, and mindfulness). With growing self-efficacy, it is reasonable to believe that Erin will internalize these thoughts and feelings throughout her counselling. Essentially, this example highlights a snapshot of the optimal environment in which MI provides for this internalization to occur (from a compassionate MI counsellor to a self-compassionate client).

Summary, Implications, and Conclusion

The purpose of this article was to highlight the link between MI and self-compassion, and the assumption that MI provides a supportive environment for the cultivation of self-compassion to occur. To our knowledge, no previous paper has explained the association between MI and self-compassion. This environment is a result of the combination of the spirit and content-based techniques used within MI. We are

currently conducting a study to examine the empirical influence of MI over time onto self-compassion, and it's six subcomponents. Specifically, we are investigating whether a MI-based intervention increases levels of client self-compassion from baseline to endpoint and whether this increase is continued at 1-month follow-up.

Future research should examine a 3-armed randomized controlled trial to compare the effects of the two different MI techniques onto self-compassion. The first arm could include MI relational techniques, whereas the second arm could include content-based techniques, and the third would include both relational and content-based techniques. Following this, another randomized controlled trial could be conducted comparing the effects of a MI intervention and a MI intervention augmented by self-compassion techniques (e.g., writing a self-compassionate letter to oneself) onto self-compassion, self-determination, and behaviour change. Qualitative interviews during and post-intervention is also recommended.

This paper, as well as the studies mentioned above, would further support this potentially important link between MI and self-compassion. This would be a significant contribution because, as previously stated, self-compassion has been causally linked to many positive outcomes. Once an empirical relationship is established between the two, this could help practitioners, clinicians, and researchers when choosing between different counselling approaches. Having a counselling approach that will enhance motivation, as well as positive constructs related to the self, such as self-compassion, allows for the optimization of interventions to occur. This would increase the likelihood of enhancing well-being among clients as well as other outcomes such as persistence to maintain those behaviours over time.

A last important note is that this paper does not propose that MI should replace self-compassion-based interventions; in fact, it is encouraged that they should be used if self-compassion is the sole outcome. Instead, this paper highlights the potential link between MI and self-compassion and suggests that MI may provide additional important positive outcomes, such as self-compassion.

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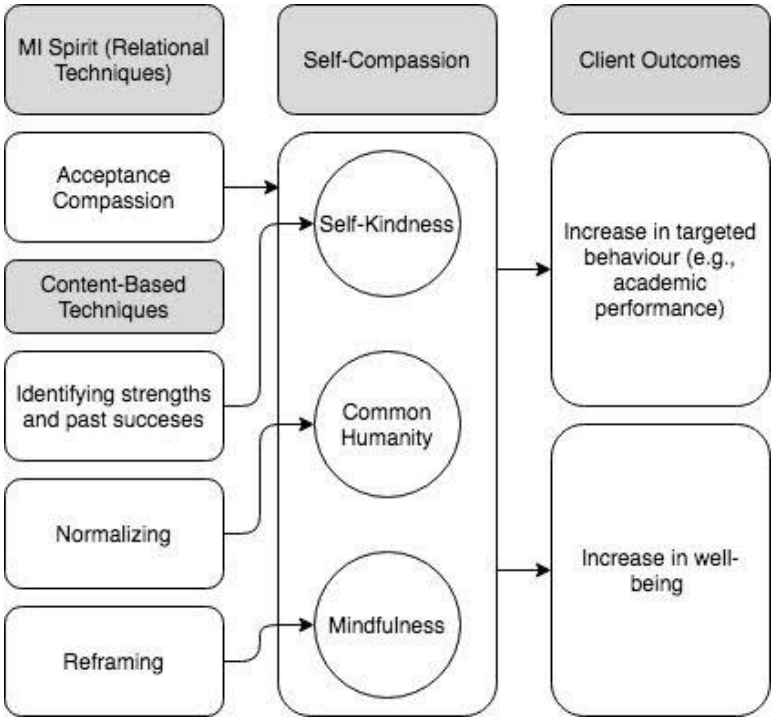
List of Figures

Figure 1



A summary model of the effects of the MI techniques (relational and content-based) on self-compassion and client outcomes

Investigating the Impact of Physical Activity Counselling on Self-Compassion and Physical Activity Levels, and Their Associations Over Time

Abstract

Physical Activity Counselling (PAC) is a Motivational Interviewing (MI)-based counselling intervention that has been shown to promote motivation for physical activity (PA), PA, and reduce depressive symptoms. However, no studies have looked at positive psychological variables, such as self-compassion (SC) within PAC despite a recent conceptual paper showing how MI is optimal to foster SC. Moreover, no research has examined SC's association with PA in the PAC context. Therefore, the purpose of this study was to examine the impact of PAC over time on SC (and its 6 subcomponents), and PA (and its 2 intensities), and to see if any improvements in SC and PA variables were sustained at 1-month follow-up. Lastly, this study examined the relationship between SC and PA over time during and after PAC. Insufficiently active university students and employees participating in the PAC on campus program (n = 40) filled out validated online questionnaires before, immediately after, and 1-month following their last PAC session. Paired-samples t-tests and repeated measures multivariate analysis of variance tests revealed that there were significant increases in total SC, self-kindness, and total, moderate, and strenuous PA from baseline to endpoint, as well as decreases in self-judgement, and isolation. These improvements were all sustained at 1-month follow-up (n = 22). Finally, common humanity at baseline had a positive relationship with moderate PA at endpoint. A randomized controlled trial with a control group and larger sample is warranted.

Keywords: physical activity counselling, self-compassion, physical activity

Introduction

Insufficient physical activity is recognized as a leading modifiable risk factor for death and non-communicable diseases, such as cardiovascular disease and cancer (González et al., 2017; Warburton & Bredin, 2017). According to worldwide physical activity measures, one in four adults remain insufficiently active and fail to meet the recommended guidelines of 150 minutes per week of moderate-to-vigorous physical activity (World Health Organization, 2018). This is alarming as there is ample evidence that regular physical activity can significantly improve physical and psychological well-being (Carr et al., 2019; Czosnek et al., 2019). Interventions aiming to promote physical activity are imperative so that all individuals can receive the myriad of benefits that physical activity offers, and so that significant health-care costs can be reduced (Krueger et al., 2014).

One intervention with the potential of increasing physical activity levels is Physical Activity Counselling (PAC; Fortier et al., 2007a). PAC is an individualized, face-to-face behaviour change intervention that is based on Motivational Interviewing (MI) and has been found to increase levels of self-reported physical activity (Fortier et al., 2011a; McFadden et al., 2017) specifically by increasing the quantity, and quality of motivation (Fortier et al., 2007b, 2011b). In fact, Fortier et al. (2011b) found that the combined influence of quantity and quality of motivation explained 17% of variance in physical activity behaviour. Despite the evidence that PAC increases physical activity through motivation, there remains 83% of unexplained variance for changes in physical activity behaviour. Therefore, further investigation is warranted in order to identify other potential underlying factors.

One plausible factor that may contribute to the increases in physical activity resulting from PAC is through self-compassion. Self-compassion is a healthy conceptualization and attitude toward the self (Neff, 2003a). Self-compassionate individuals are touched by, connected, and open to their own suffering, generating the desire to alleviate it and treat oneself with gentleness, while understanding that their suffering is part of the larger human experience (Neff & Germer, 2017). Previous research has linked self-compassion as a key component in facilitating health-promoting behaviour, such as physical activity (Biber & Ellis, 2017; Sirois et al., 2015). There are two mechanisms by which this can happen, through proactive and reactive forms of self-regulation. Firstly, high levels of self-compassion are associated with higher proactivity and quality of motivation for physical activity (Magnus et al., 2010; Semenchuk et al., 2018), which are essential for maintaining physical activity (Teixeira et al., 2012). In fact, this has been found to be the case in PAC (Fortier et al., 2007b, 2011b). Secondly, self-compassion is crucial for reacting to physical activity setbacks or failures (Ceccarelli et al., 2019; Semenchuk et al., 2018), such that individuals who are more self-compassionate are likely to more effectively self-regulate their emotions and adaptively reengage their goals following a setback (Sirois, 2015; Terry & Leary, 2011).

Essentially, it is expected that PAC creates a nutritive environment for cultivating levels of self-compassion. This can be explained by its basis in Motivational Interviewing (MI; Miller & Rollnick, 2013), which creates an accepting and compassionate environment for the client. Recently a solid case was built suggesting MI specifically is ideal to foster self-compassion (Pastore & Fortier, in press). However, no studies have empirically verified this to date.

The Current Study

Thus the overall purpose of the proposed study was to investigate the impact of MI-based Physical Activity Counselling (PAC) on levels of self-compassion (primary outcome) and physical activity (secondary outcome) in university students and employees and the relationship between these variables over the course of PAC. The specific objectives and hypotheses of the study were as follows:

(1) Examine the effect of PAC on total self-compassion, and its 6 subcomponents, from baseline to endpoint. It was hypothesized that PAC would lead to an increase in total self-compassion from baseline to endpoint (Biber & Ellis, 2017; Pastore & Fortier, in press). It was also hypothesized that PAC would lead to an increase in the positive subcomponents (self-kindness, mindfulness, and common humanity), and conversely a decrease in the negative subcomponents (self-judgement, over-identification, and isolation) from baseline to endpoint.

(2) Examine the effect of PAC on total physical activity, and its 2[2] intensities (i.e., moderate and strenuous), from baseline to endpoint. Based on previous research, it was hypothesized that PAC would lead to an increase in total physical activity from baseline to endpoint (Fortier et al., 2011a; McFadden et al., 2017). As this is the first study to explore the impact of PAC on physical activity intensity, there was no hypothesis for this research question.

(3) Examine if any improvements in self-compassion and/or physical activity were continued at 1-month follow-up. Based on previous studies that showed that self-compassion gains remained stable following self-compassion based interventions

[2] As only moderate and strenuous intensity physical activity are recommended by national health guidelines and have been associated with maximal health benefits (Godin, 2011), mild intensity was not examined in the current study.

(Biber & Ellis, 2017; Ferrari et al., 2019) it was hypothesized that improvements in self-compassion would be continued at 1-month follow-up. It was also predicted that improvements in physical activity would be continued at follow-up (Gao et al., 2016; McFadden et al., 2017).

(4) Investigate the relationship between self-compassion and physical activity variables over time from baseline to endpoint and endpoint to follow-up. Based on previous research, it was hypothesized that baseline levels of total self-compassion would be positively correlated with total physical activity at endpoint and that higher levels of total self-compassion at endpoint would be positively associated with total physical activity at 1-month follow-up (Horan & Taylor, 2018). Regarding the relationship between the subcomponents of self-compassion and total physical activity, the research is sparse and inconclusive, therefore there was no hypothesis for this research question. Lastly, since this is the first study to examine the relationships between the subcomponents of self-compassion and the physical activity intensities, there was no hypothesis for this research question.

Materials and Methods

Research Design

This study followed a within group, repeated measures research design involving three study phases with measures before (baseline), immediately after (endpoint), and 1-month following the completion of the PAC intervention[3] (follow-up).

Participants

[3] Since PAC is currently a referred service that is offered on campus for people in need of help, a control group was not possible for the current study.

To be eligible, participants had to be (a) at least 18-years-old, and (b) insufficiently active (i.e. a score ≤ 24; Godin, 2011). There were 40 students and employees involved in the Physical Activity Counselling (PAC) on campus program at one large Canadian university. See Table 1 for all participant demographics.

INSERT TABLE 1

The PAC Counsellors

The physical activity counsellors were third-year, fourth- year, or master's students in the Human Kinetics program. They must have taken the full semester PAC course and received a minimum grade of an A. The professor of the PAC course hand-selected thirteen of the top students from classes over the last few years to deliver the PAC intervention as volunteers. Information on *how* the PAC counsellors aid their clients can be found in the procedure.

The PAC Course

The PAC course was originally developed for students on the path to becoming Registered Kinesiologists. The professor of the course, and supervisor of the PAC program, was previously trained in MI and behaviour change. This course provides upper year students in Human Kinetics with training and practical experience in PAC and involves hands on training in MI and behaviour change techniques. Throughout the course, students participate in different training activities such as readings, discussions, role-plays, eight labs where they practice the techniques and a real-life counselling project where they do multiple sessions with an inactive member of the community.

Procedures

Participants were recruited to PAC between April 2019 and June 2020 by a) being referred to the program by counsellors or physicians with other services on campus (i.e.,

Health Services, Student Academic Success Services) or b) by reaching out to the program on their own (i.e., from posters on campus, online website, email newsletter, word of mouth). Once in contact with the PAC program coordinator, the participants were asked to first fill out an online sign-up sheet to obtain availability and language preference. They were also asked to fill out the baseline questionnaire online via SurveyMonkey, which included demographic questions (e.g. name, age, gender), as well as measures for self-compassion and physical activity. This questionnaire also served to screen the participants by assessing their age, and current level of physical activity to ensure inclusion for the study. For ethical considerations, all participants who reached out to the program were offered the PAC services, however those who did not meet the inclusion criteria were excluded from the study.

Next, the participant was matched to a counsellor by the coordinator based on their availability and preference for language. The participant was then contacted via email with the matched counsellor cc'd in order to introduce them. Following the email match-up, the counsellors then introduced themselves to their participant via email and arranged a meeting date and time for their first PAC session.

The participants then proceeded with their one-on-one individual face-to-face PAC, which involved approximately 30-60 minute sessions, every 1-2 weeks until required no longer. Counselling sessions were held in the counselling centre on university campus. The PAC intervention was delivered following the four phases of MI (Miller & Rollnick, 2013), which include 1) *Engaging:* establishing a trusting relationship with the client, 2) *Focusing:* helping the client find a clear focus towards change, 3) *Evoking:* eliciting and strengthening the client's motivation for change, and 4) *Planning*: guiding the client to implement a realistic change plan. Time spent in each stage depended on the participant's

willingness to change. For example, if the participant lacked motivation to be physically active, the counsellor would focus more on the evoking stage. On the contrary, if the participant was more motivated but did not know how to change, the counsellor would focus more on the planning stage.

Once the counsellor and participant collectively decided that they no longer required further PAC sessions (i.e., they were sufficiently motivated to engage in physical activity), endpoint measures were taken within a couple of days of the last session via an online SurveyMonkey questionnaire to assess the participants' current level of self-compassion and physical activity. Lastly, one month after endpoint, follow-up measures for self-compassion and physical activity were collected to determine whether improvements during the intervention persisted once the intervention ended.

Ethical approval was obtained prior to data collection. Informed consent was obtained from all participants before receiving the PAC intervention. No compensation was provided for the participants, however they were provided a free PAC service.

INSERT FIGURE 1

Measures

Demographic measures

Four questions provided information on: gender (i.e., male, female, or other), age, student or employee status and language preference. Age and gender are common demographic variables to include in self-compassion research (e.g., Murn & Steele, 2019; Yarnell, 2015).

Subjective Physical Activity

The Godin Leisure-Time Exercise Questionnaire (GLTEQ; Godin & Shephard, 1985) is very commonly used to assess the frequency and intensity of physical activity that individuals engage in per week. Participants were asked *during a typical 7-day period, how many times on average do you do the following kinds of exercise for more than 15 minutes during your free time?* Participants provided a number per week that they engaged in strenuous (heart beats rapidly; e.g., soccer), and moderate (not exhausting; e.g., fast walking) exercise. To obtain a separate score for each intensity, the frequency was multiplied by its respective Metabolic Equivalent Task value [i.e., (5 x moderate); (9 x strenuous)], giving a weighted, summed leisure score index (LSI) for each intensity. To obtain a total physical activity score, strenuous and moderate LSI values were summed, as recommended by Godin (2011). Using this questionnaire as a screening tool, participants who obtained a score less than 24 were considered "insufficiently active", while those above 24 were considered "active". This is consistent with the Canadian Physical Activity Guidelines (Tremblay et al., 2011). Overall, the validity and test-retest reliability (r = .74) for the GLTEQ is acceptable (Gionet & Godin, 1989; Godin & Shephard, 1985).

Self-Compassion

The Self-compassion Scale (SCS; Neff, 2003b) is a 26-item self-report questionnaire. The SCS includes a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*). Participants rate themselves on the 6 subscales of self-compassion: Self-Kindness (5 items, e.g., *I try to be loving towards myself when I'm feeling emotional pain*), Self-Judgement (5 items: e.g., *I'm disapproving and judgemental about my own flaws and inadequacies)*, Common Humanity (4 items, e.g., *When things are going badly for me, I see the difficulties as part of life that everyone goes through)*, Isolation (4 items, e.g., *When I think about my inadequacies it tends to make me feel more separate and cut off from the*

rest of the world), Mindfulness (4 items, e.g., *When I'm feeling down I try to approach my feelings with curiosity and openness),* and Over-Identification (4 items, *When something upsets me I get carried away with my feelings)*. For each subscale score, the mean was calculated across all participants at each time point. To calculate a total self-compassion score, self-kindness, common humanity, and mindfulness subscales were positively scored, whereas self-judgement, isolation, and over-identification subscales were negatively scored. Then means were calculated for each subscale, and a grand mean was calculated for a total self-compassion score. Higher scores on the 1-5 scale indicate higher levels of self-compassion. A score of 1-2.5 indicates the participant is low in self-compassion, 2.5-3.5 indicates moderate, and 3.5-5.0 indicates high (Neff & Germer, 2018). According to Neff (2003b), the Self-Compassion Scale has good internal consistency, with a Cronbach alpha coefficient reported of .92. In the current study, the Cronbach alpha coefficient was .89. For the 6 subscales, Cronbach alpha ranged from .85 to .90.

Fidelity of MI Techniques (Acceptance and Compassion)

There were two ways to ensure fidelity to MI techniques, specifically acceptance and compassion. The first method involved rating the counsellors on how often they were accepting, compassionate, judgemental, and uncompassionate from audio-recorded sessions with their clients. A majority of the counsellors did audio record their sessions, however only 3 counsellors were chosen at random to be involved in the rating. From these 3 counsellors, 20 of their clients were chosen to be rated for this fidelity check. For each of the 20 clients, a random 20-minute audio-recorded segment was selected and given to each of the counsellors to rate (i.e., each session was rated 3 times). After listening to each

20-minute segment twice, the coders rated[4] on four separate 7-point scales from 0 (almost never) to 6 (almost always) how often the counsellor was accepting, compassionate, judgmental, and uncompassionate. For a final score for each client on each scale, the average was taken from the 3 raters.

The second method involved a retrospective measure for those who completed the endpoint questionnaire (n = 31 participants). Nine questions (2 for compassion and 7 for acceptance) on a 7-point scale from 0 (almost never) to 6 (almost always) asked the participant how often their counsellor was accepting and compassionate. For example, one question for compassion was *"Overall (from your perspective), how often did your counsellor prioritize your specific needs and well-being (i.e., they made sure your needs and well-being were more important than their needs)?"* An example of a question for acceptance was *"Overall (from your perspective), how often was your counsellor accepting towards you?".* For each participant, a mean total acceptance and compassion score were calculated.

Statistical Analysis

All data was downloaded and analyzed in the statistical software package *IBM SPSS Version 26.0* for Mac OS (IBM Inc., 2019) on a password protected laptop.

Preliminary Analysis

Once data were entered into SPSS, the data were checked for normality and the presence of outliers. Potential covariates used in past research, namely age and gender, were also correlated with the outcome variables as was number of counselling sessions.

[4] As there is currently no validated measure for acceptance and compassion in MI, the coding guide and questions in this study were created based on the operational definitions of acceptance and compassion as defined by Miller and Rollnick (2013) in MI.

Finally, preliminary analyses also involved comparing demographic variables between participants that completed PAC with those who dropped out before starting or during PAC.

Intervention effects

To examine any changes in self-compassion and physical activity variables from baseline to endpoint (objectives 1 and 2), two separate paired-samples t-tests were conducted for the total self-compassion and physical activity scores, and two separate repeated measures multivariate analysis of variance (MANOVA) tests were conducted for the self-compassion subcomponents and physical activity intensities. In order to retain sample size and include all participants who started PAC, this study used an intention-to-treat analysis. More specifically, for participants who filled out the baseline but not the endpoint measure, the baseline-observation-carried-forward approach (Little, 2012) was used (i.e., their baseline values were used for their endpoint values). To investigate whether any improvements in total self-compassion and physical activity variables were continued at 1-month follow-up (objective 3), a third and fourth paired-samples t-test was conducted for the total self-compassion and physical activity scores, and a third and fourth repeated measures MANOVA test was conducted for the self-compassion subcomponents and physical activity intensities from endpoint to follow-up on the 22 participants that completed follow-up measures.

Statistical significance was set at $\leq .05$ for all analyses. Finally, effect sizes were calculated using Partial Eta Squared, which represents the proportion of variance in the outcome variable that can be explained by the independent variable (i.e., time). According to Cohen, 1988 (pp. 284-7), a Partial Eta Squared value of .01 (1%) is a small effect size, .06 (6%) is a medium effect size, and .138 (13.8%) is a large effect size.

The Relationship Between Self-Compassion and Physical Activity Over Time

To examine the relationships between self-compassion and physical activity variables over time, Pearson product-moment correlations were conducted. For brevity and rigor, only relationships across time points were reported for this study. According to Cohen (1988, pp. 79-81), the following guidelines were used to assess the strength of the relationship: r = .10 to .29 (small); r = .30 to .49 (medium); r = .50 to 1.0 (large).

Results

Recruitment and Participation

Figure 2 shows a flow of the participants from recruitment to completion of the study, also including those who dropped out of the program. Of the 86 participants that signed-up for PAC, 22 (26%) were referred to the program from other services on campus. Nineteen of these participants were refereed to PAC by other counsellors at the Academic Success Services, and 3 were referred from physicians at Health Services. The remaining 64 (74%) participants reached out to the PAC program on their own after seeing an email newsletter (n = 32), through word of mouth (n = 17), by seeing a poster around campus (n = 11), or by seeing our website online (n = 4).

INSERT FIGURE 2

Fifty-one participants were eligible for the current study. Of the 51 eligible, 40 participants went on to start PAC (78%), as the other 11 did not respond to emails. Two participants started PAC but dropped out during the program for unknown reasons (e.g., they did not respond to their counsellors), and 1 participant was still undergoing PAC at completion of the study; thus, 37 (93%) completed PAC (Figure 2). Of those who completed the PAC program, 6 did not complete the endpoint questionnaire and 22 completed the 1-month follow-up questionnaire. See Table 1 for participant demographics.

Preliminary Results

Self-compassion (total and subcomponents) and physical activity (total and intensity) at baseline were not significantly correlated with age[5] or gender. Additionally, change scores in total self-compassion and physical activity were not correlated with number of sessions (M = 3.33 ± 1.98 sessions, ranging from 1 to 10), so none of these variables were included as covariates in the main analyses (Table 2). Finally, there were no significant differences in the demographic variables (Table 1) between those who completed PAC (including the one undergoing PAC; $n = 38$) versus those who dropped out before starting or during PAC ($n = 13$).

Fidelity

Both methods of fidelity confirmed that all of the counsellors were accepting and compassionate, and not judgemental nor uncompassionate. For example, the average video-coded ratings for acceptance and compassion were $M = 4.05/6 \pm .66$, and $M = 4.53/6 \pm 1.18$, respectively, indicating that the counsellors were nearly almost always accepting and compassionate. The average video ratings for the counsellors being judgemental or uncompassionate were $M = 0/6$ for both, indicating that they were never judgemental or uncompassionate. In addition, all participants who completed PAC reported in their endpoint questionnaire that their counsellor was almost always accepting ($M = 5.85/6 \pm .31$) and compassionate ($M = 5.85/6 \pm .31$).

Intervention Effects

The Effects of PAC on Self-Compassion

[5] With the exception of age and over-identification, showing that younger participants were more likely to over-identify with their thoughts and emotions compared with middle-aged and older participants.

Results from the first paired-samples t-test[6] revealed a significant increase in total self-compassion from baseline to endpoint, t (39) = 2.45, $p < .05$ (two-tailed), with a 95% confidence interval ranging from .03 to .35. The eta squared statistic (.13) indicated a large effect size. The first repeated measures MANOVA test revealed a significant difference in the combined dependent variables (the 6 subcomponents of self-compassion), F (1,39) = 3.95, p = .004, Wilks' Lambda = .59; partial eta squared = .41 from baseline and endpoint. The effect size reported for the test was large.

When the results for the self-compassion variables were considered separately, changes in self-kindness (F (1, 39) = 15.43, $p < .001$, partial eta squared = .29), self-judgment (F (1, 39) = 9.21, p = .004 partial eta squared = .19), and isolation (F (1, 39) = 6.90, p = .01, partial eta squared = .15) from baseline to endpoint were all statistically significant (see Figure 2). Changes in common humanity approached significance (F (1, 39) = 3.80, p = .06, partial eta squared = .09), Partial eta squared statistic revealed that the effect sizes were medium for changes in common humanity and large for changes in self-kindness, self-judgement, and isolation. Mindfulness and over-identification were not significantly different between these two time-points ($p > .05$).

An inspection of the mean scores (Table 2) indicated that total self-compassion increased from baseline to endpoint. Of the subcomponents, the largest improvement from baseline to endpoint occurred for self-kindness (increased), followed by self-judgment (decreased), isolation (decreased), and lastly common humanity (increased).

[6] In addition to the baseline-carried-forward approach used on all of the analyses, a complete case analysis (i.e., using only those individuals who completed the endpoint measure) was also run. This concluded that there were no significant differences between the outcomes from the two approaches, and that the baseline-carried-forward approach did not significantly alter the data.

INSERT TABLE 2

The Effects of PAC on Physical Activity

Results from the second paired-samples t-test revealed a significant increase in total physical activity from baseline to endpoint, t (39) = 4.89, p < .001 (two-tailed), with a 95% confidence interval ranging from 10.09 to 24.31. The eta squared statistic (.38) indicated a large effect size. Results from the second repeated measures MANOVA test revealed a significant difference in the combined dependent variables (moderate and strenuous physical activity) F (1,39) = 8.01, p < .001, Wilks' Lambda = .61; partial eta squared = .39) between baseline and endpoint. The effect size reported for this test was large.

When the results for the physical activity intensities were considered separately, strenuous physical activity (F (1, 39) = 14.62, p < .001, partial eta squared = .27), and moderate physical activity (F (1, 39) = 8.99, p = .006, partial eta squared = .19) both significantly increased from baseline to endpoint (see Figure 3). Effect sizes for changes in both moderate and strenuous physical activity from baseline to endpoint were large.

An inspection of the mean scores (Table 2) indicated that total physical activity increased from baseline to endpoint. Of the intensities, the largest increase from baseline to endpoint occurred for strenuous, and then moderate physical activity.

INSERT FIGURE 3

Self-Compassion and Physical Activity at Follow-Up

Results from the third and fourth paired-samples t-tests revealed no significant differences in total self-compassion or physical activity from endpoint to follow-up (p > .05). In addition, the third and fourth repeated measures MANOVA tests also revealed no significant differences in the subcomponents of self-compassion or physical activity

intensity between endpoint and follow-up ($p > .05$). The results from these tests indicate continuance of self-compassion and physical activity improvements.

The Relationship Between Self-Compassion and Physical Activity Over Time

The results revealed a significant positive relationship between common humanity at baseline and moderate ($r = .28$, $p = .05$) physical activity at endpoint. This relationship was small in strength. All other correlations between self-compassion and physical activity variables over time were not significant ($p > .05$; Table 4).

INSERT TABLE 4

Discussion

To our knowledge, this study was the first to examine the impact of a Motivational Interviewing (MI) intervention, specifically Physical Activity Counselling (PAC), on self-compassion in university students and employees, as recommended by Pastore and Fortier (in press). This was also the first research to investigate the relationships between self-compassion (total and subcomponents), and physical activity (total and intensity) within the context of PAC. To date, studies on PAC have shown its positive effects on motivational variables, physical activity and physical health outcomes (Fortier et al., 2007b, 2011b; Sweet et al., 2014) and the one published study on the on campus version of PAC was conducted exclusively with five female undergraduate university students with depressive symptoms (McFadden al., 2017). In addition to filling many gaps in the literature our study targeted and impacted a larger and broader range of adults on campus. Self-compassion is an important variable to examine within PAC as it is important to understand mechanisms of change of physical activity interventions (Gourlan et al., 2016) and because a meta-analysis previously associated self-compassion with increased physical activity with a call for more research on the link between these two (Biber & Ellis, 2017).

With regards to our main purpose, which was to investigate the impact of PAC over time on self-compassion and its subcomponents, the results revealed a large effect for PAC increasing total self-compassion from baseline to endpoint as expected. These results can be better understood when discussing the conceptual basis of PAC in greater depth. Indeed, a recent paper identified a probable link between MI-based interventions such as PAC and cultivating self-compassion in clients (Pastore & Fortier, in press). However, this is the first study to investigate the effect of MI on self-compassion. Pastore and Fortier (in press) speculated that the accepting and compassionate 'spirit' that is the core of MI, as well as certain content-based techniques such as normalizing or reframing (see Hardcastle, et al., 2017) both likely cultivate a self-compassionate mindset in clients receiving MI.

With regards to the subcomponents of self-compassion, the changes were in the expected directions, all with moderate-to-large effect sizes. For example, self-kindness significantly increased whereas self-judgement and isolation decreased from baseline to endpoint. In addition, increases in common humanity from baseline to endpoint approached significance. Surprisingly, mindfulness and over-identification did not change from PAC. One potential reason for this could be the complexity of mindfulness itself as compared with self-kindness and common humanity. Having a balanced awareness of one's suffering without over-identifying with emotions is likely harder to accomplish than being kind to oneself and understanding that others face similar struggles. In fact, it is common that most individuals have trouble acknowledging their own pain and suffering (Neff & Germer, 2017) and mindfulness research has found that it takes months to develop (Bassam et al., 2013; Eberth & Sedlmeier, 2012). Moreover, a recent meta-analysis revealed that self-compassion interventions only had a small effect on increasing mindfulness, as compared

with all of the other components of self-compassion, which were moderate to large (Ferarri et al., 2019).

Results showed that changes in self-compassion were continued at 1-month follow-up, which is in line with previous self-compassion research. In fact, a recent systematic review and meta-analysis showed that gains in self-compassion lasted for as long as six months following the intervention (Biber & Ellis, 2017; Ferrari et al., 2019). Therefore, future studies examining the effects of MI or PAC on self-compassion should follow participants longer. Larger sample sizes are recommended as well as some results at follow-up (e.g., total self-compassion, self-kindness, common humanity) appeared to show further improvement following the intervention, however they were not significant likely due to low power (n = 22).

With regard to our second purpose, which was to evaluate the effectiveness of PAC on physical activity, there was a large effect for increased in total self-reported physical activity over the PAC intervention. This is in line with previous PAC studies and revealed similar large effect sizes from baseline to endpoint (Fortier et al., 2011a; Gao et al., 2016; McFadden et al., 2017). As this study extended previous research by examining the effects of PAC on the two different physical activity intensities a novel finding from this research is that PAC specifically increased moderate and strenuous physical activity intensities, and these effects were large. This is encouraging given that these are highly recommended for physical health benefits (Godin, 2011). Results showed that improvements in total, moderate, and strenuous physical activity were continued at 1-month follow-up.

The last purpose of the study was to investigate the relationship between self-compassion and physical activity variables over time within PAC. This study built on previous literature by examining the relationship between self-compassion and physical

activity (total and intensity) separate from other health-promoting behaviours (i.e., not grouped in with sleep, healthy eating, stress-management), which has only been done in one other study. In addition, this was the first study to examine the relationship between the self-compassion subcomponents and physical activity intensity over time. The only significant relationship found appeared between common humanity at baseline and moderate physical activity at endpoint. The fact that participants who were more able to understand the commonality of negative human experiences were more likely to engage in moderate intensity physical activity makes sense. This is because individuals who are better able to keep their situation in perspective and understand that physical activity setbacks and failures are common might be more likely to move past their negative emotions surrounding that setback or failure and re-engage their physical activity goals.

Surprisingly, the analysis on the other relationships between the self-compassion and physical activity variables did not support the research hypothesis. Although there has been preliminary evidence for their association in previous research (e.g., Horan & Taylor, 2018), the results are inconclusive, and some studies have also found no relationship between the two (e.g., Hallion et al., 2018). One plausible explanation for this is that self-compassionate individuals are very mindful of their body needs (Neff & Germer, 2017) and aim to seek various types of health-promoting behaviours, including sleep, healthy eating, self-care, and stress-management (Biber & Ellis, 2017; Hu et al., 2018; Miller & Strachan, 2020). These other health behaviours might align more with individual needs, and therefore will be prioritized over physical activity behaviour. Lastly, there is also the possibility that there exists no relationship between some of the self-compassion and physical activity variables.

Limitations and Future Directions

There were several limitations associated with this study. First, the lack of a control group and random assignment is a major limitation and restricts interpretation of the results. There is a possibility that changes in self-compassion and physical activity could have changed due to other reasons than PAC, such as getting attention from a counsellor and having a sense of accountability from them. In order to make strong conclusions about the effectiveness of this intervention, a randomized controlled trial (RCT) would need to test this intervention against a control group. In addition, a larger sample size would allow a greater representation and generalizability to a broader population and would yield more accurate results. A larger sample would also allow researchers to test for self-compassion as a mediator between PAC and physical activity or broader well-being variables.

Participant drop out and missing data (i.e., not completing questionnaires) was also another major limitation. Eleven insufficiently active participants dropped out before initiating PAC. In addition, 15 participants completed PAC, but did not fill out the endpoint and follow-up questionnaires. This resulted in using the baseline-observation-carried-forward approach for missing data, which may have misrepresented the trajectories of these variables. Despite this, the results did in fact reveal moderate-to-large effect sizes. Future research should address this problem and aim to develop strategies to increase participation after sign-up has occurred, as well as to retain participants throughout the course of the study (e.g., shorter questionnaires, constant communication).

Despite the limitations, this research is novel and has implications for knowledge, future research, and practical application. First, this study provides preliminary evidence that a MI-based intervention, such as PAC, might lead to increases in self-compassion, specifically by increasing self-kindness and decreasing self-judgement and feelings of isolation. More research is however needed. A logical next step would be to conduct a 2-

armed RCT with 1 group receiving PAC and the other a control group. This would help to determine with more confidence, whether changes in self-compassion are a result of PAC. Finally, this study would be useful for practitioners choosing or designing interventions. If future research concludes that MI is effective in cultivating self-compassion, practitioners may wish to use MI in their intervention. This would enable them to not only promote behaviour change, but also to increase self-compassion, which has been linked with psychological and physical health (Homan & Sirois, 2017; Zessin et al., 2017).

Conclusion

This study set out to examine the impact of PAC, an already promising intervention, on self-compassion (total and subcomponents), and physical activity (total and intensities). In addition, the effects of PAC on these variables 1-month following PAC, as well as the associations between self-compassion and physical activity variables over time before and after PAC were examined. The results provided empirical support for the link between MI and self-compassion as stated by Pastore and Fortier (in press). Indeed, preliminary evidence was found supporting PAC, a MI-based intervention, as an effective approach to increase self-compassion and physical activity as many effects were medium or large despite a smaller sample size. Lastly, despite the interesting positive link revealed between common humanity and moderate physical activity, this study seems to show that the associations between self-compassion and physical activity might not be as solid as previously thought, warranting more research in this area. This study provides practical application for practitioners with the desire to cultivate self-compassion in their clients. Future research should conduct multiple-arm randomized controlled trials with a larger sample size to ensure with more confidence that PAC is leading to increases in self-compassion and physical activity over time.

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List of Tables

Table 1

Demographic variables for eligible study participants

	Overall (*n* = 51)	**Completed PAC[a] (*n* = 38)**	**Dropped out of PAC[b] (*n* = 13)**
Age, years			
Mean (SD)	32.33 (11.45)	33.16 (11.56)	31.50 (13.64)
Range	18-59	18-57	18-59
Gender, *n* (%)			
Male	14 (27)	10 (26)	4 (31)
Female	37 (73)	28 (74)	9 (69)
Status, n (%)			
Student	15 (29)	12 (32)	3 (23)
Employee	36 (71)	26 (68)	10 (77)
Preferred Language, *n* (%)			
English	29 (57)	20 (53)	9 (69)
French	2 (4)	1 (2)	1 (8)
Bilingual	20 (39)	17 (45)	3 (23)
Recruitment, *n* (%)			
Referred	17 (33)	13 (34)	4 (31)
Reached out on their own	34 (67)	25 (66)	9 (69)

[a] Completed (*n* = 37) or currently undergoing (*n* = 1) PAC.

[b] Dropped out before (*n* = 11) starting or during (*n* = 2) PAC.

Table 2

Unadjusted mean ± standard deviation values for total self-compassion, its six subcomponents, total physical activity (PA), and its three intensities across three time points

Variable	Baseline (N = 40)	Endpoint (N = 40)	Follow-Up (N = 22)
	Mean ± SD	Mean ± SD	Mean ± SD
Total Self-Compassion*,[a]	2.27 ± .64	2.45 ± .85	2.54 ± .92
Self-Kindness*	2.49 ± .86	2.90 ± .99	2.95 ± 1.01
Self-Judgement*	3.53 ± .86	3.24 ± .95	3.05 ± 1.10
Mindfulness	3.08 ± .85	3.21 ± 1.02	3.16 ± .97
Over-Identification	2.83 ± .83	3.00 ± .95	3.06 ± 1.06
Common Humanity	2.76 ± .79	2.97 ± 1.02	3.11 ± 1.05
Isolation*	3.36 ± .92	2.97 ± 1.10	2.86 ± 1.22
Total PA*,[b]	8.38 ± 7.99	26.42 ± 25.37	26.55 ± 29.52
Moderate PA*	1.00 ± 1.13	2.23 ± 2.89	3.18 ± 5.04
Strenuous PA*	0.43 ± .64	1.48 ± 2.00	1.18 ± 1.59

[a]Self-Compassion: 1-2.5 low self-compassion, 2.5-3.5 moderate self-compassion, 3.5-5.0 high self-compassion (Neff & Germer, 2018)

[b] Total physical activity: < 24 insufficiently active, ≥ 24 sufficiently active. Score calculated using self-reported moderate and vigorous physical activity only (Godin, 2011)

*Significant differences from baseline to endpoint ($p < .05$)

Table 3

Correlations between demographic, self-compassion and physical activity variables at baseline (n = 40)

Variable	Age[a]	Gender	Number of Sessions[b]
Total Self-Compassion	.30	.06	.00
Self-Kindness	.16	.06	.20
Self-Judgement	-.27	-.05	-.13
Mindfulness	.25	.01	.09
Over-Identification	-.37*	.10	.28
Common Humanity	.12	.03	.12
Isolation	-.16	-.21	-.02
Total Physical Activity	-.12	-.07	.22
Moderate Physical Activity	.00	-.05	.08
Strenuous Physical Activity	-.11	.04	.25

[a] To allow for greater accuracy in comparing across age, 3 equal groups based on frequency distribution were used (Group 1: 18-23 years; Group 2: 23-42 years; Group 3: 42-59 years).

[b] Number of sessions was correlated with change scores for total self-compassion and physical activity variable from baseline to endpoint

* $p < .05$. ** $p < .01$

Table 4

Correlations between self-compassion and physical activity variables over time

Note. 1, Baseline; *2*, Endpoint; *3*, Follow-up

	2 Total PA	**Mod. PA**	**Stren. PA**	**3 Total PA**	**Mod. PA**	**Stren. PA**
1						
SC	.15	.21	.02	.11	.08	.08
SK	-.06	.05	-.19	.12	.11	.06
SJ	-.19	-.21	-.09	-.11	-.06	-.11
M	.13	.07	.12	.31	.15	.37
OI	-.11	-.25	.06	.02	-.06	.16
CH	.20	.28*	.04	.13	.12	.07
I	-.13	-.12	-.11	.11	.10	.06
2						
SC	-	-	-	.03	.03	.01
SK	-	-	-	.14	.09	.13
SJ	-	-	-	.01	-.01	.05
M	-	-	-	-.03	-.02	-.03
OI	-	-	-	.05	.01	.09
CH	-	-	-	.06	.07	.01
I	-	-	-	.05	.06	-.01

Note. SC, Self-compassion; *SK,* Self-Kindness; *SJ,* Self-Judgement; *M,* Mindfulness; *OI;* Over-Identification; *CH,* Common Humanity, *I,* Isolation*; PA,* Physical Activity; *Mod.*, Moderate; *Stren.*, Strenuous.

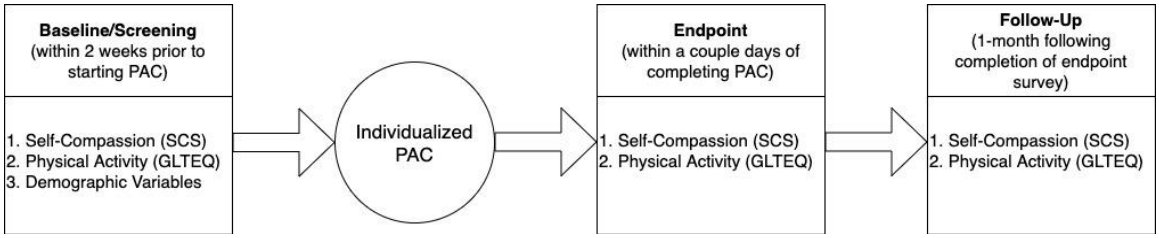
Note. Baseline and endpoint (n = 40); follow-up (n = 22).

* $p < .05$. ** $p < .01$

List of Figures

Figure 1

Research Design

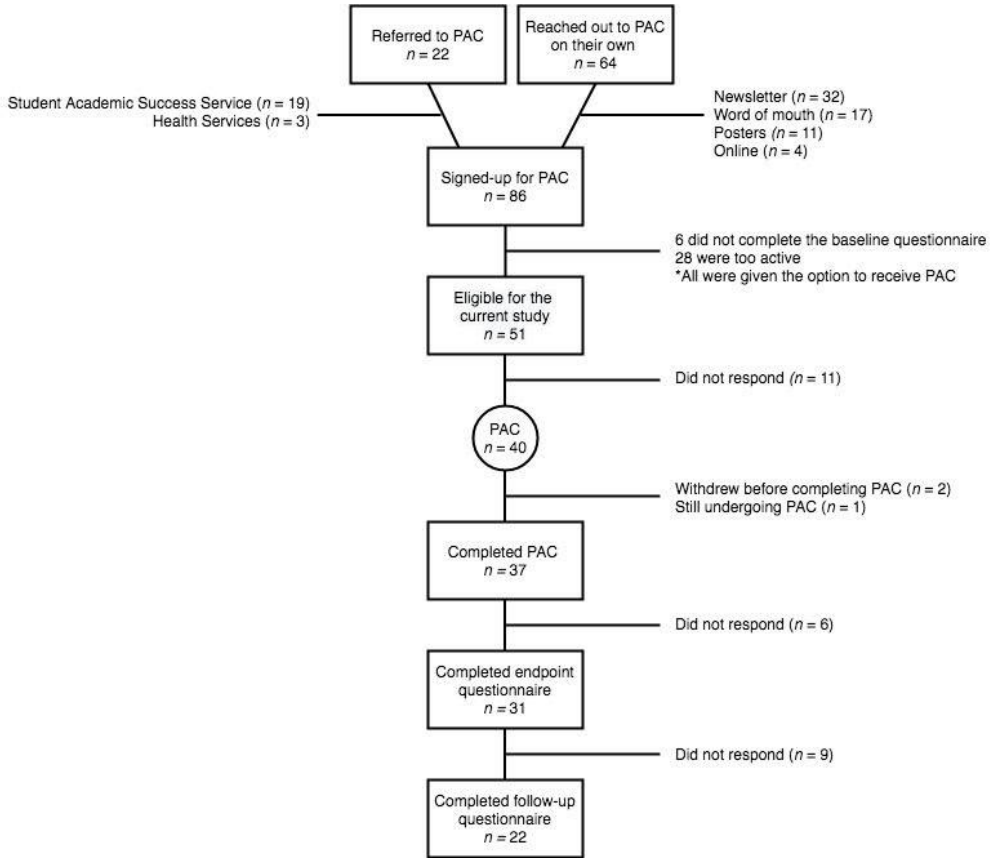


Note. SCS, Self-Compassion Scale; G*LTEQ,* Godin Leisure-Time Exercise Questionnaire.

Note. Demographic Variables; Age, Gender, Student or Employee Status

Figure 2

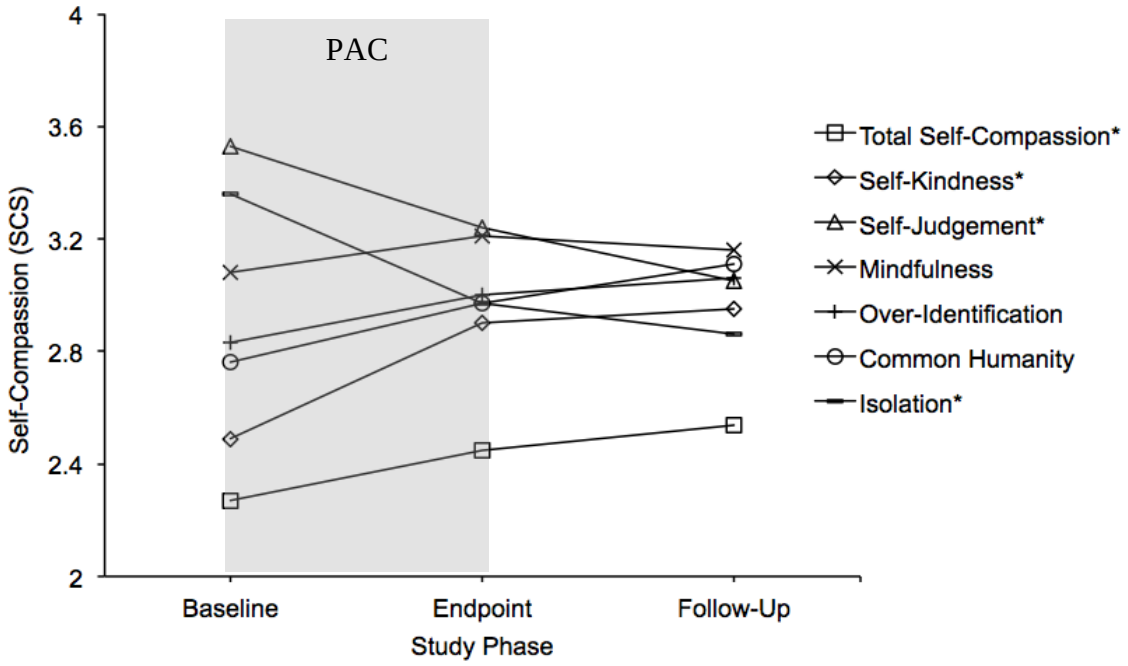
Flow of study participants from recruitment to follow-up, including attrition



Note. PAC, Physical Activity Counselling.

Figure 2

Levels of self-compassion, and its 6 subcomponents across three time points during the PAC study as measured by the Self-Compassion Scale (SCS)



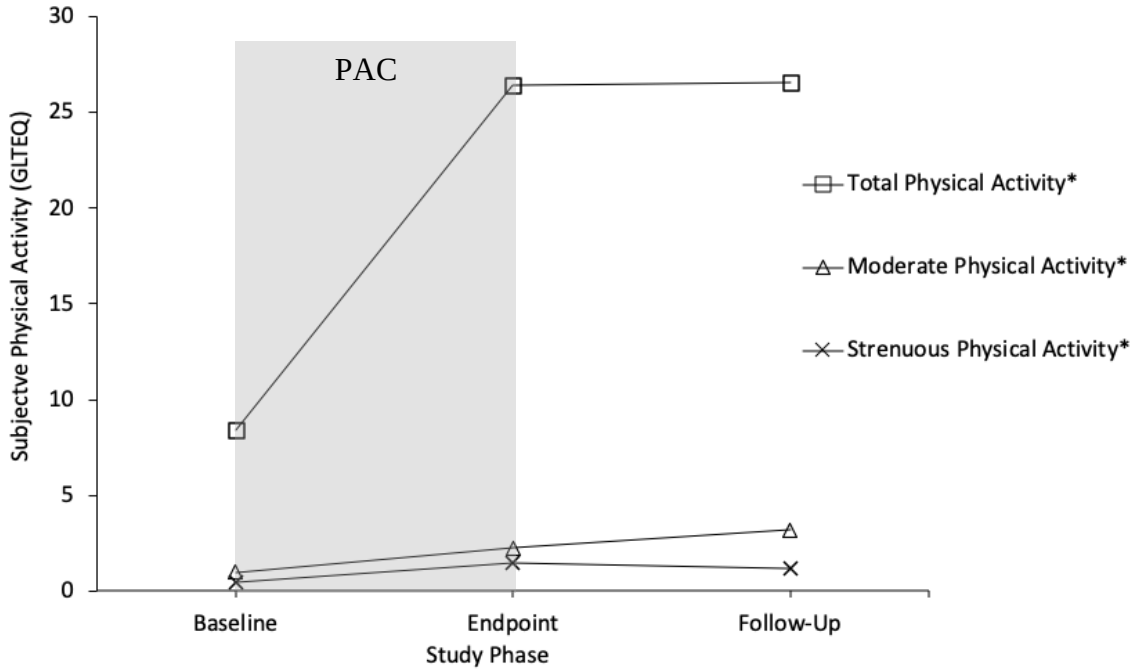
Note. For the SCS, separate subscale values were all positively scored, and a mean was calculated. To calculate total self-compassion, self-kindness, common humanity, and mindfulness were positively scored, whereas self-judgement, isolation, and over-identification were negatively scored. Means were then calculated for each subscale, and a grand mean was calculated for a total self-compassion score.

Note. From baseline to endpoint (N = 40). From endpoint to follow-up (N = 22).

*Significant difference from baseline to endpoint

Figure 3

Levels of total physical activity, and its 2 intensities across three time points during the PAC study as measured by the Godin Leisure-Time Exercise Questionnaire (GLTEQ)



Note. From the GLTEQ, Moderate physical activity = (5 x frequency); Strenuous physical activity = (9 x frequency); Total physical activity = (moderate physical activity + strenuous physical activity).

Note. From baseline to endpoint (N = 40). From endpoint to follow-up (N = 22).

*Significant difference from baseline to endpoint

Chapter IV: General Discussion

The Link Between Motivational Interviewing and Self-Compassion

The first purpose of this dissertation, which was accomplished in Article 1 (A1), was to explore the link between Motivational Interviewing (MI) and self-compassion. This paper posited that the accepting and compassionate spirit of MI (i.e., relational techniques, Hardcastle et al., 2017), and certain content-based techniques within could help to cultivate a self-compassionate mindset within clients receiving MI. Though all MI techniques contribute to its effectiveness in promoting desirable client outcomes, the accepting and compassionate spirit would likely be the primary way in which self-compassion is cultivated. Ways that the counsellor can show acceptance and compassion as posited in A1 and as measured for fidelity in Article 2 (A2) are by affirming the client and by actively promoting the client's specific needs. Moreover, some researchers have also speculated that compassionate therapeutic relationships in general might also cultivate self-compassion (Desmond, 2016; Germer, 2012). This is likely due to the fact that these types of relationships provide a nutritive environment that supports the client in their personal growth and development. Undoubtedly, this type of relationship is assumed in MI-interventions based on its spirit alone.

The second way in which this paper postulated that self-compassion might be cultivated through MI is by four specific content-based techniques. These include: identifying past successes, identifying strengths, reframing, and normalizing, all which likely target one of the three components of self-compassion. For example, a counsellor highlighting that their client's negative experiences are common (i.e. normalizing) is likely to make them feel more connected (i.e., common humanity) rather than isolated. The

content-based techniques are important to the effectiveness of MI, however they must be employed with acceptance and compassion.

Another discussion in this paper involved identifying potential moderators that might influence the process of the client internalizing a self-compassionate mindset. One that was suggested to have a potential influence is trauma experienced by the client. Previous research has shown that individuals who have had moderate-to-severe exposure to trauma are less self-compassionate, and are more afraid of being self-compassionate and receiving compassion from others (Barlow et al., 2017; Boykin et al., 2018). Perhaps this would make cultivating self-compassion much more difficult. By contrast, if the client has had less exposure to trauma, they would likely cultivate self-compassion more easily as they would be less afraid of being self-compassion and resistant to others given them compassion.

Overall, this paper was novel as no researchers had explored the association between MI and self-compassion conceptually, nor had hypothesized that MI likely cultivates self-compassion. Moreover, this article provided a solid foundation for empirical research to investigate the impact of MI-based interventions onto self-compassion, which was accomplished in A2.

Effects of Physical Activity Counselling on Self-Compassion

The second purpose of this dissertation was to conduct an experimental study to empirically test the link between MI and self-compassion. These results are reported in A2, whose main objective was to examine the impact of a MI-based intervention, specifically PAC on campus program on self-compassion and its subcomponents.

The findings from this article revealed moderate-to-large effect sizes for increases in total self-compassion, self-kindness, as well as decreases in self-judgement and

isolation, from baseline to endpoint. These results were consistent with the hypothesis and provide preliminary evidence to support the effectiveness of an MI-based intervention, specifically PAC, for cultivating self-compassion as. Indeed, findings of this study indicated that the PAC clients began to internalize the accepting and compassionate stance that was provided by their counsellors as postulated in A1. Our fidelity data did indeed show that the PAC counsellors were very accepting and compassionate.

A surprising finding from this study was that there were no changes in mindfulness nor over-identification after receiving PAC. More specifically, it was expected that mindfulness would increase, and over-identification would decrease from baseline to endpoint. In addition to the reasons given in the discussion of A2, it is also possible that these results were due to the fact that our intervention was not a self-compassion intervention that uses explicit techniques to enhance self-compassion, and specifically mindfulness. For example, most self-compassion interventions use guided meditations in order to enhance the mindfulness component of self-compassion, and these interventions have only found small-to-medium changes in mindfulness (e.g., Bluth & Eisenlohr-Moul, 2017; Held et al., 2018). There is the possibility that mindfulness is likely much more complex to develop and perhaps might take longer to manifest. Indeed it is likely that more explicit self-compassion techniques are necessary to develop mindfulness, and a 3-armed trial could help to conclude this.

Due to the design of the study and specifically the lack of control group, there is the possibility that changes in self-compassion occurred due to extraneous factors. For example, fluctuations in perceived stress levels over the course of PAC could have influenced changes in self-compassion from baseline to endpoint. This could have influenced their levels of self-compassion such that higher levels of perceived stress have

been found to associate with lower levels of self-compassion (Bohadana et al., 2019; Sirois & Hirsch, 2018). This is because when an individual is less self-compassionate, they will be more likely to catastrophize negative situations that are occurring in their life and will experience and over-identify with the anxiety following the stressor (Allen & Leary, 2010). On the contrary, self-compassionate individuals are more likely to evaluate their stressful experiences in a positive light and will seek less challenging tasks that will result in failure (Allen & Leary, 2010). It is recommended that future studies also track perceived stress throughout the course of the study to account for this.

Effects of Physical Activity Counselling on Physical Activity

The second objective of A2 was to examine the impact of the Physical Activity Counselling (PAC) on campus program onto physical activity and its 2 intensities. This study extended previous research on the PAC on campus program, which found that PAC led to an increase in physical activity and reduced depressive symptoms in five undergraduate female students (McFadden et al., 2017). The study in this dissertation recruited a larger number (i.e., n = 40) and broader range (i.e., males and employees) of individuals, and also looked at the impact of PAC on physical activity intensity (i.e., mild, moderate, strenuous), which has not been previously done.

Consistent with previous research on the effects of PAC on physical activity in primary care and on campus (Fortier et al., 2011a; McFadden et al., 2017), the results from A2 indicated that PAC did lead to a large increase in total physical activity from baseline to endpoint. A plausible reason to explain these increases in total physical activity levels is that in addition to being based on MI, which has been found to increase physical activity (Frost et al., 2018). PAC focuses on discussing self-regulatory strategies (e.g., self-monitoring) to help the client initiate physical activity. For example, the counsellors often

encourage the use of various self-regulation strategies (e.g., goal setting, problem solving, action planning; see Gagnon et al., 2018), which have been linked to increased likelihood of engaging in physical activity behaviour (Kanejima et al., 2019; Painter et al., 2017). Another novel finding from this study was that PAC led to improvements in moderate and strenuous forms of physical activity specifically. This is a promising finding as the recommended guidelines for adults are 150 minutes per week of *moderate-to-strenuous* physical activity to ensure optimal health benefits (World Health Organization, 2018).

Due to the design used however, there are other potential reasons why increases in physical activity could have occurred. For example, having to see a counsellor every couple of weeks, the client could have felt a sense of accountability for being physically active. Knowing that they would have to discuss their progress with their counsellor in the next session, the client could have been motivated to stay active and stick with their goals. Another plausible reason is that changes in the weather could have influenced levels of physical activity, such that warmer months have been linked to higher physical activity behaviour (Klompstra et al., 2019). Although this study attempted to account for seasonal changes by recruiting participants from September to April of the following year, when participants started and ended PAC was not tracked. This could mean that although participants were recruited in varying months, they could have mostly ended around the same time in warmer months, resulting in the increased physical activity levels found in this study. Future research regarding PAC should track when and for what period of time (e.g., weeks or months) the participants were involved in PAC.

Self-Compassion and Physical Activity at Follow-up

The third purpose of A2 was to examine whether any changes in self-compassion or physical activity variables were continued at 1-month follow-up. This is important to

study and the results revealed that the improvements found for the self-compassion and physical activity variables did continue at 1-month follow-up, and although not significant, the mean scores for some of these variables continued to improve. For example, total self-compassion, self-kindness, common humanity, and moderate physical activity continued to increase, whereas self-judgement and isolation continued to decrease at follow-up. These were likely not detected due to low sample size at follow-up (n = 22).

The sustained gains in self-compassion and physical activity provides preliminary evidence to support the role of the PAC on campus program in equipping clients to continue being self-compassionate with themself and sustain their physical activity improvements even 1-month after completion of PAC. Perhaps the fact that PAC fosters self-determined forms of motivation for physical activity (Fortier et al., 2007b; Sweet et al., 2014) plays a role in continued physical activity levels. In fact, self-determined motivation for physical activity has repeatedly been linked to physical activity behaviour over time (Deci & Ryan, 2017; Owen et al., 2014). Moreover, self-compassion has been found to be a predictor of self-determined motivation for physical activity (Barczak & Eklund, 2018; Magnus et al., 2010). Since this study found that PAC fosters self-compassion, it is possible that self-compassion is helping to enhance physical activity through indirect processes, such as self-determined motivation. This might also explain why barely any relationships between the self-compassion and physical activity variables were found in this study. Future studies should examine the associations and interplay between self-compassion and self-determined motivation onto physical activity over time within the context of PAC.

Additionally, other interventions that have increased self-compassion have shown continuance of gains (Bluth et al., 2015; Neff & Germer, 2013) concluding that once developed, a self-compassionate mindset is likely to continue after the intervention. This

is encouraging from a cost-effectiveness perspective. Though a longer period of time (e.g., 18-24 months) following the PAC intervention is needed to determine whether self-compassion and physical activity are being maintained. However, the increasing trajectories found in this study are promising.

The Relationship Between Self-Compassion and Physical Activity Over Time

Finally, the second article set out to examine the relationships between self-compassion (total and subcomponents) and physical activity (total and intensities) variables over time in individuals receiving PAC. Most of the research that has been done on self-compassion and its subcomponents in a health context is surrounding general health-promoting behaviours grouped together, with physical activity being only one component alongside sleep, healthy eating, and stress-management to name a few (Dunne et al., 2016; Gedik, 2019). While some cross-sectional studies have found a link (e.g., Miller & Strachan, 2020), there has only been one study, to our knowledge, that has examined the influence of self-compassion on physical activity behaviour alone *over time*, and they found that self-compassion was not related to total physical activity behaviour in a sample of working adults (Li et al., 2019). The influences of the subcomponents of self-compassion on physical were not examined in this study, nor were the results generalizable to students. Therefore, the current study helped to clarify these relationships in a sample of university students and employees, and was the first to examine the associations between the subcomponents of self-compassion and physical activity (total and intensities) over time.

The results from A2 revealed few significant relationships, in line with Li et al. (2019). However, this study did further extend the knowledge surrounding which of the subcomponents of self-compassion might be related with physical activity, being that the

results did indicate that feelings of common humanity might positively influence moderate intensity physical activity. One reason to explain this finding is that common humanity likely plays an important role when responding to physical activity setbacks and failures, which are common for beginner exercisers. Individuals with higher common humanity are better able to understand that their experiences are part of the larger human experience (Neff & Germer, 2017), which would allow these individuals to feel less isolated and have less negative emotions surrounding their physical activity setbacks and failures. There have been no studies to examine the subcomponents of self-compassion independently as they relate to physical activity setbacks, therefore future research is warranted on this topic.

The findings from the present study revealed no other significant relationships between self-compassion and physical activity variables. To explain their similar non-significant results between self-compassion and physical activity, one study by Hallion et al. (2019) referred to the possibility of individuals choosing other health behaviours. Indeed, it is possible that the participants engaged in and prioritized other health behaviours, such as improving their sleep, nutrition, or better managing their stress, instead of increasing their physical activity. Measuring multiple health behaviours in studies or qualitative research would be useful to verify this hypothesis.

Another reason for many non-significant relationships could be that this study specifically measured current self-reported leisure-time physical activity rather than maintenance over longer periods of time. Hallion et al. (2019) also suggested that self-compassion might play a more prominent role when it comes to maintenance of physical activity, rather than short-term.

Finally, another likely reason that we didn’t find many significant relationships is that self-compassion may increase physical activity via indirect pathways, such as self-

regulation or self-determined motivation, as previously mentioned (Hallion et al., 2018; Magnus et al., 2010). This is well supported in previous research that has shown that self-compassionate individuals have bolstered self-regulatory strategies (Sirois, 2015), and are more likely to have self-determined forms of motivation for physical activity (Semenchuk et al., 2018). Finally, perhaps self-compassion's greatest contribution is not on health behaviours but onto broader psychological variables such as mental health or happiness.

Significance

This dissertation has many scientific contributions as it addressed many gaps in the literature, as previously outlined. To our knowledge, this dissertation was the first to explore and build a case for the link between MI and self-compassion (A1), and to test it empirically through PAC (A2). Although the best study design was not used in A2 due to feasibility and ethical considerations, conducting experimental research is a rigorous way to determine effects of interventions (Brough, 2019). In addition, A2 was the first study to examine the impact of PAC onto self-compassion (total and subcomponents) and physical activity intensity. Indeed, while PAC has been shown to positively effect motivation, physical activity behaviour and depressive symptoms (Fortier et al., 2011a, 2011b; McFadden et al., 2017), no studies have looked at the impact of PAC onto other positive psychological variables, such as self-compassion. Lastly, no studies have looked at the associations between self-compassion subcomponents and physical activity intensities over time.

From an applied perspective, this dissertation also has many practical implications. First, this dissertation, and specifically A1, may be useful to many practitioners as it highlights the importance of being accepting and compassionate and how to do so. A practical example was provided showing how to do this, by affirming the client's strengths

and respecting the client's individual needs. This dissertation and specifically results from A2 confirmed the importance of providing such a nutritive environment for the client. If further research concludes that MI-based interventions are effective in cultivating self-compassion, this would also be helpful to many clinicians. For example, when designing or choosing an intervention to promote behaviour change, a clinician may wish to choose MI as it not only facilitates self-determined motivation, but also it seems to impact self-compassion, which together could promote desirable client outcomes. This is important, as self-compassion has been linked to a myriad of psychological health benefits, such as increased happiness, overall well-being, and decreased depression and anxiety (Neff et al., 2018; Zessin et al., 2015).

Finally, A2 also has practical contributions in the context of increasing physical activity. The fact that this study used PAC as the MI-based intervention can help to further support its role in alleviating the physical inactivity burden in Canada. Considering PAC has been repeatedly found to enhance physical activity (Fortier et al., 2011a; Gao et al., 2016; McFadden et al., 2017), serious thought should be given to integrating more Kinesiologists into primary care that can deliver this type of intervention as per recommended by Fortier et al. (2006) and Moore et al. (2015). Essentially, helping more individuals become regularly active is important as a large proportion of the population are not physically active enough to receive the many benefits of physical activity. Not only does physical inactivity negatively impact individual health, but it also surpasses epidemic proportions in Canada and accounts for a significant portion of health care spending, in which costs are an estimated 10 billion dollars annually (Krueger et al., 2014). Moreover, increasing levels of physical activity in the population will likely result in fewer hospitalizations and therefore less money spent on hospital visits.

Limitations and Future Directions

A primary limitation of this dissertation, specifically in A2, was the lack of a control group and randomization. This prevented confidence in interpreting results and concluding that PAC did in fact lead to changes in self-compassion and physical activity. Though PAC is currently a referred program on campus and a control group was therefore not possible for this dissertation, future research should recruit a larger number of participants and conduct a randomized controlled trial with a control group as well as follow the participants for longer periods to determine maintenance of changes.

Another notable limitation was participant attrition in A2. As a result of this, a baseline-value-carried-forward approach for missing data was used. This might have misrepresented the different trajectories of change that could have occurred from baseline to endpoint (Little et al., 2012). However, considering this approach was compared against the complete-case analysis and there were no significant differences, and that the results did reveal moderate-to-large effects, there is more confidence in interpreting these results. It is important that future research addresses these limitations and understands how to optimally retain participants during and after PAC. For example, as recommended by Little et al. (2012), some examples include, increasing communication, keeping the participant contact information up to date, or making the questionnaires shorter.

Another limitation for the current study is the use of the Self-Compassion Scale, which measures general self-compassion as opposed to self-compassion specific to the physical activity domain. Since the current study, and some other studies, have found non-significant findings when it comes to self-compassion and physical activity, researchers should consider developing a self-compassion scale as it relates to physical activity in order to better ascertain the role of self-compassion in influencing physical activity. In addition,

future studies should also include a scale to measure fear of self-compassion, which assesses an individual's cautions and worries when it comes to being self-compassionate (Gilbert et al., 2011). This could help to understand why individuals might not be enhancing their self-compassion, and further techniques could be put into place in order to help these individuals specifically.

Lastly, it is also important to note that the end of this study occurred when the COVID-19 pandemic happened. During this time, three participants who signed up were unresponsive and did not go on to complete PAC, and five who completed PAC did not go on to complete the endpoint and follow-up surveys. In addition, some participants (n = 9) completed PAC at this time, meaning that they filled out the endpoint and follow-up questionnaire during the outbreak. As this is an uncontrollable limitation, nothing could have been done to prevent this. However, once this happened, an additional question was added to the endpoint and follow-up questionnaire, which asked the participants, *On the following scale from -4 (negative effect) to +4 (positive effect), to what extent did the ongoing COVID-19 outbreak effect your physical activity levels? Negative effect (i.e., you engaged in physical activity less than usual) Positive effect (i.e., you engaged in physical activity more than usual).* From this question, it appeared that levels of physical activity were negatively effected by the outbreak, reporting a mean negative effect of M = -.89 + 2.39 at both endpoint and follow-up. Therefore, indicating that these participants reported on average engaging in less physical activity as usual. When this was accounted for in the analyses, there were no changes in the results.

There are many avenues for future research from this dissertation. First, after a 2-armed RCT is conducted with a control group, a third arm could be added in which a third group would receive PAC plus explicit self-compassion techniques. (e.g., getting the client

to write a compassionate letter to themselves pertaining to a physical activity setback; Neff & Germer, 2018). Adding in explicit techniques would help to examine whether integrating self-compassion intervention within PAC would be useful beyond the accepting and compassionate nature of PAC. In such, a study on other measures such as self-determined physical activity motivation, and self-regulation skills could also be integrated in order to investigate some of the links that were proposed in this discussion. A mixed-method RCT would be the best option to also allow qualitative exploration of these relationships.

Second, examining the role of the other components of the MI spirit (i.e., partnership and evocation), in addition to acceptance and compassion, onto self-compassion would be interesting. The current dissertation solely focused on acceptance and compassion within MI, however the components of partnership and evocation might also play an important role in cultivating self-compassion. For example, establishing a trusting partnership with the client is essential in order for the client to perceive the counsellor as accepting and compassionate. In addition, without the counsellors actively evoking, the client would be less likely to realize inner resources and strengths. In order to study this, coding the different MI spirit components (i.e., partnership, acceptance, compassion, and evocation) and a self-report scale for the clients, like used in this study, would be helpful. Coding the content-based techniques in addition to the MI spirit in PAC (as done by Gagnon et al., 2018) would also be interesting. This would help to determine the relative contribution of MI spirit versus content-based techniques onto self-compassion and its subcomponents.

Finally, since self-compassion might be more related to increases in well-being as opposed to self-care and health promoting behaviours, examining other positive psychological variables (e.g., happiness, life satisfaction) within PAC as they are affected

by self-compassion is warranted. Examining self-compassion as a mediator between PAC and these positive psychological variables would also be interesting.

Conclusion

This dissertation set out to explore the link between Motivational Interviewing (MI) and self-compassion (SC; Article 1), and examine the impact of a MI-based intervention, specifically the Physical Activity Counselling (PAC) on campus program on SC, its 6 subcomponents, physical activity, and physical activity intensity in 40 university students and employees (Article 2). A strong case was built for the ability of MI to translate into higher SC in clients and this was confirmed by the results in Article 2 showing medium-to-large improvements in self-compassion and physical activity even using a conservation data imputation strategy. These increases were sustained at 1-month follow-up even despite a smaller than ideal sample size. In addition, Article 2 assessed the relationship between SC and physical activity variables over time confirming other studies conclusions that physical activity might not be participants' first choice to manifest their growing SC. This dissertation filled many knowledge gaps and should inspire practitioners, such as physical activity counsellors, to show high levels of acceptance and compassion towards their clients to incite them to do the same with themself so their clients can benefit from having a self-compassionate attitude. Many future research ideas should extend from this dissertation with the first step being a 2-armed RCT.

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Statement of Contributions

The authors and their respective contributions to this dissertation are outlined below:

Olivia Lena Pastore was involved in the following tasks for Article 1: co-conceptualization and manuscript writing (i.e., producing the original drafts of all of the sections, which were received by the co-authors and returned for revisions multiple times). For Article 2, I was involved in: co-conceptualization of the project and study design, participant recruitment, data collection (i.e., administering the surveys), data analysis, and manuscript writing.

Dr. Michelle Fortier was involved in the co-conceptualization and significant manuscript editing of Article 1 (i.e., multiple rounds of revisions on the journal article). She also supervised all of the phases of the research project in Article 2 and was particularly involved in the following tasks: co-conceptualization of the project and study design, and significant article editing. Lastly, Dr. Fortier was involved in editing the present thesis through multiple rounds of revisions.

Taylor McFadden was involved in the following tasks for Article 2: co-conceptualization of study design and article editing.

Appendices

Appendix A – Participant Consent Form

Title of the study: Investigating the Impact of Physical Activity Counselling on Self-Compassion and Physical Activity Levels, and Their Associations Over Time

Research Assistant: Olivia Lena Pastore (M.A.(c))
Co-investigator: Taylor McFadden (Ph.D.(c))
Project Supervisor: Dr. Michelle Fortier

Affiliation: School of Human Kinetics, Faculty of Health Sciences, University of Ottawa

Invitation to participate: I am invited to participate in the above mentioned research study conducted by Olivia Lena Pastore, Taylor McFadden and Dr. Michelle Fortier.

Purpose of the study: The purpose of the study is to evaluate the impact of a free physical activity counseling (PAC) program being offered to university students and employees. The main objectives of the proposed research are to examine the impact of PAC on the clients' self-compassion and physical activity levels, and to examine their associations over time.

Participation: Participants will be informed of this first come first served basis when they contact the PAC program. Prior to my first PAC session, I will be asked to complete an online baseline survey asking questions relating to my physical activity and self-compassion. I will be asked to complete the same questionnaire again at the end of the PAC intervention, and again at follow-up one month later. Each research activity I participate in will be held in the Counseling Centre (Room 414), Montpetit Hall, 125 University, Ottawa, Ontario.

As a participant I WILL NOT be video recorded. My voice might be recorded during PAC sessions regardless of my participation in the study. The counsellors rely on recordings as a self-evaluation tool and as a means to revisit sessions to better prepare for future ones. By giving consent to participate in the study, I also give permission to the researchers to use the recordings of the PAC sessions to allow them to ensure that the intervention is being delivered as intended.

Benefits: Participation in the PAC program could potentially help improve the physical activity levels of the participants, which may improve their physical and mental health as well as their mood. My participation in this study will potentially contribute to the advancement of knowledge in the current field of exercise psychology and help recognize PAC as a method of increasing physical activity and achieving better health.

Risks: I might experience minor psychological or emotional discomfort as a result of the discussions that I may have with my counsellor during PAC sessions. I have received assurance from the researcher that every effort will be made to minimize these risks.

Confidentiality and anonymity: I have received assurance from the researcher that the information I share during PAC sessions or through questionnaires will remain strictly

confidential. I have been guaranteed that my identity will be protected through the use of ID number codes to identify participants on all questionnaire data. My name will not be revealed in any future documents or publications.

Conservation of data: I understand that all data will be on a locked computer with a protected passcode and hard copies will be kept both in the principal and co-investigator's locked office and the supervisor's office at the University of Ottawa with limited access. The data will be conserved for 5 years following the end of data collection and will then be safely destroyed.

Compensation: No compensation will be given for participating in this study.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw from the study, I will also have the option to withdraw my data. If I chose to withdraw from the study but I would like to continue PAC, this will have no effect on future PAC sessions.

If you wish to participate in this study, please complete the attached survey. Your decision to complete and return this survey will be interpreted as an indication of your consent to participate. The survey should take you approximately 15-20 minutes to complete. You do not have to answer any questions that you do not want to answer. We would appreciate receiving it within the next 7 days. If we do not receive it by said date, we will send you a notice of reminder.

If I have any questions about the study, I may contact the researchers or the supervisor.

If I have any questions regarding the ethical conduct of this study, I may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5 Tel.: (613) 562-5387

Email: ethics@uottawa.ca

Appendix B – Ethics Certificate

Université d'Ottawa University of Ottawa
Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Health Sciences and Science Research Ethics Board

APPROVAL OF MODIFICATIONS

August 20, 2019

Taylor McFadden [redacted]

Michelle Fortier [redacted]

Olivia Lena Pastore [redacted]

RE: Investigating the Impact of Peer-to-Peer Physical Activity Counselling (PAC) Program Implemented of University of Ottawa Campus to Improve Health of Students (H10-16-16)

Dear Professor Fortier, Ms. McFadden, and Pastor,

The Health Sciences and Science Research Ethics Board has examined your request for ethics approval of the following modifications to your research project:

- Ms. Olivia Lena Pastore joins the research team as student researcher and will collect data for her master's thesis project which title is "Investigating the Impact of Physical Activity Counselling on Self-Compassion and Physical Activity Levels in Adults: A Pilot Study."
- Mr. Jean-Christian Gagnon has left the research team.
- The following questionnaires are added to the pre and post online surveys: (1) The Behavioural Regulation Exercise Questionnaire-3 (BREQ-3), (2) The Subjective Happiness Scale (SHS) (3) The Self-Compassion Scale (SCS).

Your request has been accepted. The certificate of ethics approval renewed on March 08, 2019 and valid until March 07, 2020 covers these modifications.

During the course of the study, any further modifications to the protocol or forms may not be initiated without prior written approval from the REB. You must also promptly notify the REB of any adverse events that may occur.

If you have any questions, please do not hesitate to contact me at extension 5387.

Sincerely yours,

[redacted]

Protocol Officer for Research Ethics
For Daniel Lagarec, Chair of the Health Sciences and Sciences REB

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http://www.research.uottawa.ca/ethics/index.html

Appendix C – Research Assistant Confidentiality Agreement

Confidentiality Agreement to be signed by all research assistants

Project title: **Investigating the Impact of Physical Activity Counseling on Self-Compassion and Physical Activity Levels in Adults: A Pilot Study**

Principal Investigator (s): Michelle Fortier
Taylor McFadden

I, **Olivia Lena Pastore**, am participating in the above-referenced project **(Investigating the Impact of Physical Activity Counseling on Self-Compassion and Physical Activity Levels in Adults: A Pilot Study)** in the capacity of **research assistant** and will have access to data collected during the course of the Project. I hereby agree:

1. To keep all information shared with me (Confidential Information) strictly confidential. I further agree not to reveal any such Confidential Information to any other person, firm, corporation, company or other entity unless specifically authorized to do so in writing by the Principal Investigator(s) of the Project.

2. To use the Confidential Information only for the purposes of the Project and not for any other purpose unless authorized to do so in writing by the Principal Investigator (s).

3. To return all Confidential Information provided to me in any form to the Principal Investigators when I have completed my tasks. If the Confidential Information is not returnable, I will erase or destroy any such Confidential Information, including, without limitation, information stored on a computer hard drive or on a USB data storage device, and will confirm in writing its erasure or destruction to the Principal Investigator(s).

4. These obligations of confidentiality will continue after my participation in the Project has ended.

[redacted]
Research Assistant — 06/03/2019 (date)

[redacted]
(Principal Investigator) — 28/02/2019 (date)

[redacted]
(Principal Investigator) — 01/03/2019 (date)

Appendix D – Recruitment Posters

Need Help Getting Active?

The University of Ottawa is now offering **free** Physical Activity Counselling (PAC) to all insufficiently active students and employees! Physical Activity Counselling focuses on motivating individuals to be more physically active for their own reasons. The goal of the PAC program is to increase levels of physical activity among students to improve overall physical and mental health. The physical activity counsellor's of the PAC program are students who are on the path to becoming registered Kinesiologists, who have additional training in motivation building and behaviour change. Students are the leaders of tomorrow. It is crucial for you to be physically and mentally healthy in order to succeed!

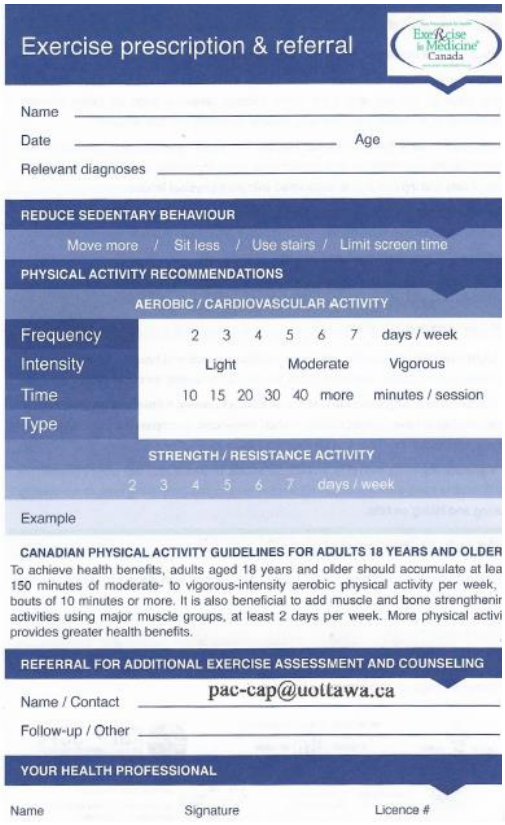
Book an appointment today by e-mail:
pac-cap@uottawa.ca

Besoin d'aide pour devenir plus actif?

L'université d'Ottawa offre des services **gratuits** de Counseling en activité physique (CAP) aux étudiants qui désirent devenir plus actifs physiquement! Le CAP vise à motiver les étudiants à intégrer l'activité physique dans leur vie quotidienne pour leurs propres raisons. Le but principal du programme CAP est d'augmenter les niveaux d'activité physique des étudiants afin d'améliorer leur santé physique et mentale. Les conseillers sont des étudiants au baccalauréat en voie de devenir des kinésiologues certifiés et qui ont une formation additionnelle en changement de comportement et en motivation. Les étudiants sont les leaders de demain. Il est primordial que d'être en bonne santé physique et mentale pour connaître du succès!

Réservez un rendez-vous par courriel au:
pac-cap@uottawa.ca

Appendix E - PAC Referral Pads



Exercise prescription & referral

Name _____

Date _____ Age _____

Relevant diagnoses _____

REDUCE SEDENTARY BEHAVIOUR

Move more / Sit less / Use stairs / Limit screen time

PHYSICAL ACTIVITY RECOMMENDATIONS

AEROBIC / CARDIOVASCULAR ACTIVITY

Frequency	2	3	4	5	6	7	days / week
Intensity		Light			Moderate		Vigorous
Time	10	15	20	30	40	more	minutes / session
Type							

STRENGTH / RESISTANCE ACTIVITY

2 3 4 5 6 7 days / week

Example

CANADIAN PHYSICAL ACTIVITY GUIDELINES FOR ADULTS 18 YEARS AND OLDER

To achieve health benefits, adults aged 18 years and older should accumulate at lea 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, bouts of 10 minutes or more. It is also beneficial to add muscle and bone strengthenir activities using major muscle groups, at least 2 days per week. More physical activi provides greater health benefits.

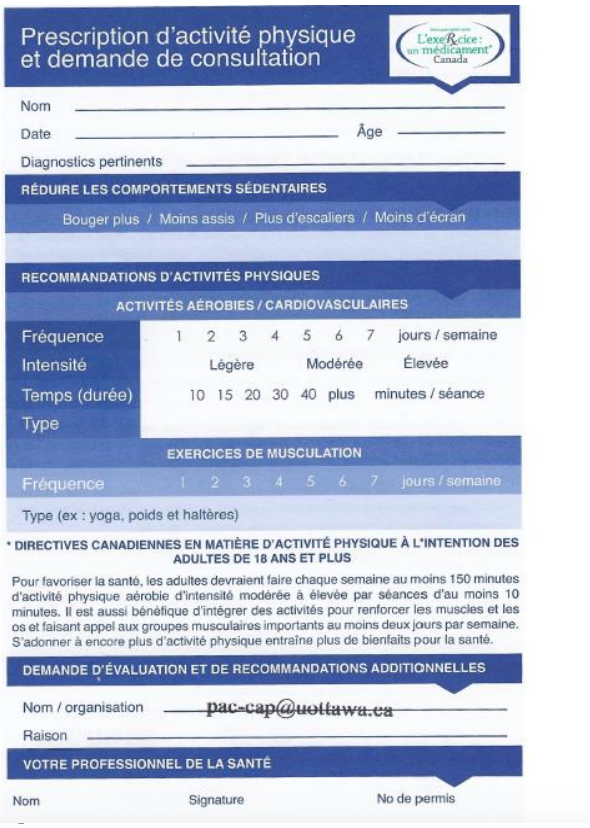
REFERRAL FOR ADDITIONAL EXERCISE ASSESSMENT AND COUNSELING

Name / Contact pac-cap@uottawa.ca

Follow-up / Other _____

YOUR HEALTH PROFESSIONAL

Name Signature Licence #



Prescription d'activité physique et demande de consultation

Nom _____

Date _____ Âge _____

Diagnostics pertinents _____

RÉDUIRE LES COMPORTEMENTS SÉDENTAIRES

Bouger plus / Moins assis / Plus d'escaliers / Moins d'écran

RECOMMANDATIONS D'ACTIVITÉS PHYSIQUES

ACTIVITÉS AÉROBIES / CARDIOVASCULAIRES

Fréquence	1	2	3	4	5	6	7 jours / semaine
Intensité		Légère			Modérée		Élevée
Temps (durée)	10	15	20	30	40	plus	minutes / séance
Type							

EXERCICES DE MUSCULATION

Fréquence 1 2 3 4 5 6 7 jours / semaine

Type (ex : yoga, poids et haltères)

* DIRECTIVES CANADIENNES EN MATIÈRE D'ACTIVITÉ PHYSIQUE À L'INTENTION DES ADULTES DE 18 ANS ET PLUS

Pour favoriser la santé, les adultes devraient faire chaque semaine au moins 150 minutes d'activité physique aérobie d'intensité modérée à élevée par séances d'au moins 10 minutes. Il est aussi bénéfique d'intégrer des activités pour renforcer les muscles et les os et faisant appel aux groupes musculaires importants au moins deux jours par semaine. S'adonner à encore plus d'activité physique entraîne plus de bienfaits pour la santé.

DEMANDE D'ÉVALUATION ET DE RECOMMANDATIONS ADDITIONNELLES

Nom / organisation pac-cap@uottawa.ca

Raison _____

VOTRE PROFESSIONNEL DE LA SANTÉ

Nom Signature No de permis

Appendix F – The Godin Leisure-Time Exercise Questionnaire (GLTEQ)

1. During a typical 7-Day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time (write on each line the appropriate number).

a. STRENUOUS EXERCISE (HEART BEATS RAPIDLY) (e.g. running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

Times per week _____

b. **MODERATE EXERCISE (NOT EXHAUSTNG)** (e.g. fast walking, baseball,, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

Times per week _____

c. MILD EXERCISE (MINIMAL EFFORT) (e.g. yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)

Times per week _____

2. During a typical 7-Day period (a week), in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

a. Often ____

b. Sometimes ____

c. Never/Rarely ____

Scoring Instructions:
Screening + Total Physical Activity Score = (9 x strenuous) + (5 x moderate)
Mild Measure Score = (3 x mild)
Moderate Measure Score = (5 x moderate)
Strenuous Measure Score = (9 x strenuous)

Appendix G – Self-Compassion Scale (SCS)

How I typically act towards myself in difficult times.

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost Never				**Almost Always**
1	**2**	**3**	**4**	**5**

1. I'm disapproving and judgmental about my own flaws and inadequacies.
2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
5. I try to be loving towards myself when I'm feeling emotional pain.
6. When I fail at something important to me I become consumed by feelings of inadequacy.
7. When I'm down, 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.

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

To compute a total self-compassion score, take the mean of each subscale, then compute a total mean.

Appendix H – Compassion and Acceptance Measure

Overall (from your perspective) how often ...
Rate the following on a 7-point scale from 0 (almost never) to 6 (almost always):

Almost Never						**Almost Always**
0	**1**	**2**	**3**	**4**	**5**	**6**

1. Did your counsellor prioritize your specific needs and well-being (e.g., they made sure your needs and well-being were more important than their needs)?
2. Was your counsellor compassionate and caring towards you?
3. Did your counsellor affirm or acknowledge your strengths/abilities/efforts?
4. Did your counsellor focus on your weaknesses/downfalls?
5. Was your counsellor accepting towards you?
6. Was your counsellor non-judgemental towards you?
7. Was your counsellor respectful and supportive of your autonomy and personal choices?
8. Did your counsellor honour your freedom to choose and think for yourself without being forceful?
9. Did your counsellor take the time to understand your perspective and point of view?

Scoring Key:
Acceptance: (3 + 5 + 6 + 7 + 8 + 9 + 4*) / 7
Compassion: (1 + 2) / 2

*Reverse Scored

Appendix I – MI Fidelity Coding Guide

Part 1: Definitions of compassion and acceptance in MI (Miller & Rollnick, 2013)

I. **Compassion:** Based on Eric Fromm who described it as an unconditional form of loving that seeks to actively promote ones well-being and growth, as well as giving priority to the other's needs.

- Relating to those we serve in a valuing manner and never as objects to be manipulated.

II. Acceptance: Defined based on Rogers' definition of acceptance. Taken together with the below components, acceptance refers to honouring each person's *absolute worth* and potential as a human being, recognizing and supporting the person's irrevocable *autonomy* to choose his or her own way, seeks through *accurate empathy* to understand the other's perspective, and *affirms* the person's strengths and efforts.

Includes:

- *Absolute worth*: involves prizing the inherent worth of the individual or having unconditional positive regard for them. This deals with accepting the individual as a separate person, a respect for the other as having worth in his or her own right. It is a basic trust – a belief that this other person is somehow fundamentally trustworthy. The opposite of placing judgement or worth on another individual.
- *Affirmation*: to seek and acknowledge the person's strengths and efforts. Not merely an experience of appreciation, but an intentional way of being and communicating. Its opposite is the search for what is wrong with people and identifying weaknesses.
- *Accurate empathy*: an active interest in and effort to understand the internal perspective. An ability to understand another's frame of reference and the conviction that it is worthwhile to do so. The opposite is the imposition of one's own perspective, perhaps with the assumption that the other's views are irrelevant or misguided.
- *Autonomy support*: honouring and respecting the person's autonomy, their irrevocable right and capacity of self-direction. The opposite is an attempt to coerce or control the other.

Part 2: Phrases in PAC

Compassionate Phrases	Accepting Phrases
Supporting the client with a statement of care or compassion. E.g., I understand that there is really a lot going on for you right now.	Emphasizing the client's control, freedom of choice, autonomy, and ability to decide. E.g. Yes you're right. No one can force you to do physical activity
Showing great interest in the client's well-being and growth. E.g., I really want you to succeed and I'm going to do everything I can to help you.	Affirming the client by saying something positive or complimentary. Can be an affirmation of strengths, abilities, or efforts in any aspect of the client's life, not just the target behaviour. E.g., You are the kind of person that, once you make up your mind you usually get the job done
	Having unconditional positive regard for the client and respecting them as a unique individual. E.g., I respect that your needs are different than other individuals and we're going to find what works for you.
	Statements about the counsellor making an effort to understand the client's perspective and feelings. E.g., I understand that this is very important to you and means a lot to you and your health.
Uncompassionate Phrases	**Judgmental Phrases**
Statements that show a lack of compassion or care for the client E.g., You don't really have a lot going on in your life right now.	Statements that are coercive or controlling. E.g. You have to do physical activity it's good for you.
Showing little interest in the client's well-being and growth. E.g., Helping you to be physically active isn't my job.	Statements of the counsellor focusing on negatives/weaknesses/downfalls of the client. E.g., Your time management skills are a huge weakness and you should focus on fixing them.

	Statements that are judgemental towards the client and their situation. E.g., I find it unreasonable that you can't make time for physical activity.
	Statements about the counsellor making little effort to understand the client's perspective and feelings. E.g., I don't understand how this isn't important for you.

Part 3: Calculating an overall score

Overall how often was the counsellor …

Rate the following on a 7-point scale from 0 (almost never) to 6 (almost always):

Almost Never						**Almost Always**
0	**1**	**2**	**3**	**4**	**5**	**6**

1. Accepting
2. Compassionate
3. Judgmental
4. Uncompassionate