Working Out with F.I.D.O. (Frequency, Intensity, Duration, & Outcomes) – A Feasibility Randomized Controlled Trial

by

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Bachelor of Sport and Fitness Leadership, Camosun College, 2012
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Supervisory Committee

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Abstract

Objective: Dog owners have been shown to walk more per week compared to non-dog owners; however, 60% of dog owners are still not walking their dogs at intensities sufficient to reap optimal health benefits. The aim of this study was to evaluate the feasibility, acceptability, and efficacy of a 9-week feasibility randomized controlled trial involving a program of six weekly scheduled instructor-led group dog walks supplemented with theory-based strategies to encourage increased dog walking among dog owners in Greater Victoria, BC. ***Methods***: This study was based on the multi-process action control (M-PAC) framework and utilized an open parallel randomized controlled trial design involving experimental and waitlist-control group participants. Quantitative data was collected using pedometers and self-report measures. A program evaluation survey was administered upon the completion of the study. Primary outcomes examined the feasibility and acceptability of the program; secondary outcomes analyzed pedometry and self-report moderate-to-vigorous physical activity (MVPA) data; and tertiary outcomes observed changes in participants' perceptions of M-PAC constructs. Percentage calculations were used to obtain primary outcomes, and analysis of covariance (ANCOVA; controlling for baseline) was performed to examine secondary and tertiary outcomes to explore the direction of effects and obtain a first estimate of expected effect sizes. ***Eligibility***: Male and female adults aged 18+ living in Greater Victoria, BC, who owned at least one healthy and friendly dog aged six months and above, who were not meeting recommended guidelines of 150 minutes of MVPA per week, and who were medically cleared to participate. ***Results:*** Feasibility outcomes included 74 interested

responses, 23% recruitment rate (*n* = 17), 94% retention rate (*n* = 16), and 94% adherence rate (*n* = 15). Program participants were overall (very) satisfied with the program – worksheets (62.5%), program instructor (100%), various program/group dog walks logistics (75% to 100%). *Total weekly step counts* and *average daily step counts*, *MVPA dog walking*, and *MVPA with dog* increased at the end of the program and at follow-up, resulting in large effect sizes when compared to the waitlist-control group. *MVPA dog walking* and *total MVPA* (*with and without dog*) exceeded recommended guidelines at follow-up. Positive changes across time were observed for *dog responsibility* and M-PAC constructs of *affective judgments*, *opportunity*, *planning*, *identity*, and *habit*, resulting in medium and large effect sizes when compared to the waitlist-control group. ***Conclusions***: This six-week group dog walking program is overall feasible, acceptable, and efficacious in encouraging increased dog walking and MVPA among dog owners. Attendance at weekly scheduled instructor-led group dog walks and exposure to the M-PAC construct worksheets resulted in program participants' adoption and maintenance of positive behavioral changes at the end of the program and at follow-up. Program participants reported enjoying the program and being (very) satisfied with it. It is recommended for future studies to refine/modify initial recruitment strategies and eligibility criteria, reimburse medical/veterinarian clearance costs to reduce cost-related barriers to participation, offer a variety of options for program delivery (e.g., different locations/schedules/seasons, online programs, multi-site study) to accommodate more participants, and apply the M-PAC framework to a larger sample.

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List of Abbreviations and Glossary of Terms

ANCOVA	Analysis of Covariance
CI	confidence interval
CSEP	Canadian Society for Exercise Physiology
CPT	Certified Personal Trainer
CSCS	Certified Strength & Conditioning Specialist
EXPO	exponential transformation/exponentially transformed
GLM	general linear model
LOG	log transformation/log transformed
NSCA	National Strength & Conditioning Association
M-PAC	multi-process action control
MV	moderate-to-vigorous
MVPA	moderate-to-vigorous physical activity
OE	outcome expectations
p value	significance level
PA	physical activity
PAR-Q	Physical Activity Readiness Questionnaire
RCT	randomized controlled trial
SET	socio-ecological theory
SCT	social cognitive theory
SDT	self-determination theory
TPB	theory of planned behavior

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My utmost gratitude goes to my supervisor, Dr. Ryan Rhodes, for his guidance throughout the last five years and giving me the privileged opportunity to integrate my lifelong love for dogs with my graduate research, and allowing me to combine my interest in health and physical activity promotion with my experience in fitness instruction to culminate in a valuable, purposeful, and enjoyable study to benefit public health. Under his supervision, I have accumulated many new and useful skills in research and expanded my knowledge through critical thinking and independent learning. I would like to thank Dr. Rhodes for his compassion and patience throughout longstanding periods of extenuating life and family circumstances, and during seasons of providential afflictions. I'd also like to extend my sincerest gratitude to my thesis committee member, Dr. Joan Wharf Higgins. She is generous in sharing her creative ideas and pragmatic resolutions to obstacles, always quick to answer queries and help out with questions, and she never fails to have kind and encouraging words to offer to a student in need.

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Dedication

I dedicate this study to all my beloved dogs, past and present, whom I have owned, lived with, cared for, and loved. Each of them has been individually special and precious. The intelligence, intuition, personalities, and companionship of my dogs have inspired me greatly throughout this research. My dogs' love, loyalty, friendship, and their delightful innocent souls have truly been this present life's heavenly blessings.

Most of all, I dedicate this to my Beautiful Beloved, the Almighty Sovereign Immutable Living GOD Whom my soul loveth, my Righteous Redeemer, the Holy One of Israel, the KING of kings and the LORD of lords, the Name above all names, my Jealous and Relentless Savior, the Altogether Lovely "Hound of Heaven".

I once was lost, but now am found;
Was blind but now I see. – John Newton, 1779
Died He for me, who caused His pain;
For me, who Him to death pursued. – Charles Wesley, 1738

Whom have I in Heaven but Thee? And there is none upon earth that I desire beside Thee. My flesh and my heart faileth; but GOD is the strength of my heart, and my portion forever. – Psalms 73: 25-26 (KJV)

Amazing Love! Amazing Grace!

Chapter 1 – Review of Literature

1:1 – Introduction

Physical activity has been shown to provide many health benefits including protection against coronary heart disease, hypertension, diabetes, depression, and improvements in body composition (Lee at al., 2012; Warburton, Nichol, & Bredin, 2006). However, it is estimated that approximately 85% of Canadian adults are not meeting physical activity guidelines necessary to reduce the risk of morbidity and premature mortality (Colley et al., 2011), and the prevalence of adult obesity in Canada has also tripled from 6.1% to 18.3% between 1985 and 2011 (Twells, Gregory, Reddigan, & Midodzi, 2014). To achieve health benefits and reduce health risks, the Canadian Society for Exercise Physiology (Canadian Society for Exercise Physiology, 2016) recommends that adults over 18 years of age accumulate at least 150 minutes of moderate-to-vigorous physical activity (MVPA) per week.

Walking is undeniably one of the safest and most affordable forms of physical activity (Fogelholm, 2005) and offers numerous health and well-being benefits (C3 Collaborating for Health, 2012). It is easily achievable by a large majority of people with little skill or equipment involved, and is an activity that can be performed individually or with others in groups. Walking can serve as a means of occupational transportation or as a recreational activity, and when performed as the latter, it allows for stress relief and social interaction (U.S. Department of Health & Human Services, 2015). Taking these

factors and benefits into consideration, it appears sensible for physical activity promotion efforts to target the activity of walking.

It has been found that acquiring a dog leads to more walking (Cutt, Knuiman, & Giles-Corti, 2008b) and physicians are increasingly recognizing the valuable and supporting role that dogs play in the health of their owners (Levine et al., 2013; Smith, 2012). With the Canadian dog population estimated at 7.6 million in 2016 (Canadian Animal Health Institute, 2017), it is not an uncommon sight to see many Canadian dog owners out walking with their dog. Compared to non-dog owners, dog owners have been found to engage in higher levels of walking per week (Westgarth, Christley, & Christian, 2014). Additionally, dog owners who value the benefits of dog walking for their dog and who personally enjoy the time spent with their dog in the activity have been found to walk more per week than dog owners who do not value the benefits nor enjoy the activity (Lim & Rhodes, 2016). This dedicated dog walking behavior is not deterred even in foul weather (Temple, Rhodes, & Wharf Higgins, 2011). Unfortunately, half of all dog owners are still not walking their dogs (Christian et al., 2013), and among those who are, 60% are not walking at intensities recommended to achieve health benefits (Lim & Rhodes, 2016). Thus, for the long-term health and well-being of both dog owners and their dogs, interventions targeted at the dog owner population are important and warranted.

This study investigated the feasibility, acceptability, and efficacy of a 9-week randomized controlled trial involving weekly scheduled group dog walks supplemented

with M-PAC construct intervention strategies to encourage increased dog walking and physical activity among active dog owners in Greater Victoria, BC. In this first chapter, the literature on dog walking is described notably as a review of psychological theories and factors influencing dog walking, and dog walking observational and intervention research. The chapter goes on to detail the M-PAC framework utilized in this study and closes with the primary, secondary, and tertiary research questions and hypotheses. Chapter 2 details the methodology used in this open parallel randomized controlled trial, including participant recruitment and eligibility, a description of the intervention, measures used, and the data analysis protocol. Results are presented in Chapter 3 organized according to the primary, secondary, and tertiary outcomes, and intervention worksheet responses. Chapter 4 offers a discussion of the findings juxtaposed with the literature, and closes with the study's strengths, limitations, and recommendations for future research.

1:2 – Correlates and Psychological Theories of Dog Walking

Understanding the correlates of physical activity is important as effective physical activity promotion is founded on such knowledge. Several dog walking studies to date have applied the use of psychological theories and conceptual models to better understand the correlates of dog walking (Westgarth et al., 2014). Inarguably, dog walking is a synergistic activity that relies on the relationship between the dog owner and dog to occur, and simply owning a dog does not lead to the enactment of dog walking behavior nor does having the intention to walk one's dog always translate into the actual

behavior of doing so (Brown & Rhodes, 2006; Rhodes & Lim, 2016). Several recent reviews conducted on dog walking and physical activity have found that various dog-related, personal, psychological, social/interpersonal, and environmental factors are correlated to the activity and behavior of dog walking (Christian at al., 2013; Christian et al., 2016; Westgarth et al., 2014).

Physical environment

Studies exploring dog walking and the external physical and built environments have found that having dog-supportive infrastructure encourages dog owners to engage in dog walking. Living in highly walkable neighborhoods, living within close proximity to designated dog parks, and having dog-supportive features such as off-leash areas, dog waste bags, good lighting, and footpath connectivity are important environmental factors that promote dog walking (Westgarth et al., 2014). Seasonal and weather conditions also make up the physical environment, and inclement weather did not deter dog owners from keeping up with their park use and dog walking behavior (Temple et al., 2011). When compared to non-dog owners, dog owners reported more recreational walking in their neighborhoods both in summer and winter seasons (Lail, McCormack, & Rock, 2011).

Social environment

Dog owners who reported receiving social support from their dogs felt more motivated to walk their dogs (Westgarth et al., 2014; Westgarth, Knuiman, & Christian,

2016). In addition, dogs act as social conduits (Wharf Higgins, Temple, Murray, Kumm, & Rhodes, 2013; Wood et al., 2015) and the engagement of dog walking leads to increased social opportunities with others and fosters a sense of community and networking through getting to know the neighborhood, meeting people (non-pet owners and pet owners), and interacting with fellow dog owners (Wood, Giles-Corti, Bulsara, & Bosch, 2007). Female dog owners also reported an increased sense of safety when walking with a dog (Christian et al., 2016; Westgarth et al., 2014). However, walking the dog may be less likely to occur if the dog owner and dog do not share a close supportive bond or a high level of attachment (Westgarth et al., 2016).

Personal and psychological factors

Dog owners' personal beliefs such as their perceived ability and opportunity to walk the dog, their outcome expectations of (regular) dog walking, and their sense of responsibility towards their dog also play a role in their enactment of dog walking behavior. Dog owners who felt a stronger sense of obligation/responsibility (Brown & Rhodes, 2006) towards their dog, and dog owners who perceived and valued that dog walking was beneficial for their dogs engaged in more dog walking than dog owners who did not (Lim & Rhodes, 2016). Additionally, because dog owners' motivation to walk their dogs differed in quality, dog owners who intrinsically enjoyed the activity of dog walking performed more dog walking than dog owners who did not enjoy doing so (Lim & Rhodes, 2016). This supports the notion that merely owning a dog does not always

motivate one to walk the dog unless enjoyment/pleasure and personally valuing the benefits of doing so are involved.

Dog-related factors

Physical activity guidelines exist for varying dog breeds based on veterinarian and dog trainer recommendations (Vet Street, 2017), and dogs of all sizes can benefit from regular exercise (Pet MD, 2017). Studies on dog walking have shown that owners of larger dogs and dogs whose owners perceived needed more exercise walked more per week than owners of smaller (and toy-breed) dogs (Degeling, Burton, & McCormack, 2012; Lim & Rhodes, 2016; Westgarth et al., 2016). Further, Lim and Rhodes (2016) found that individual dogs' energy levels – regardless of breed size and age – were associated with dog walking behavior among dog owners independent of dog owner motivation. Sex of dog was not found to be associated with dog walking behavior but unruly/unfavorable dog behaviors such as aggression, leash pulling, lack of obedience, fear of strangers/noises/stimuli, and barking were negatively associated with the amount the dogs were walked (Westgarth et al., 2014). Other dog-related factors that could deter walking include old age and/or illnesses (Degeling & Rock, 2013; Westgarth et al., 2016), number of dogs, and weight status of dogs (Westgarth et al., 2014).

Dog walking interventions – randomized controlled trials

Observational research on the correlates of dog walking has also informed the development of a small number of interventions for promoting dog walking (Christian et al., 2016). With the rising interest in dog walking as a viable means to increase physical activity and improve health, several attempts have been made to deliver dog walking and physical activity interventions to the dog owner population. According to a recent review on dog walking and physical activity research by Christian et al. (2016), six of the seven intervention studies published to date have been conducted as randomized controlled trials. Some of the intervention strategies applied in these randomized controlled trials have included: (1) getting overweight dog owners to exercise with their overweight dogs (Kushner, Blatner, Jewell, & Rudloff, 2006); (2) the encouragement of family dog walking (Morrison et al., 2013); (3) the use of an educational brochure (Rhodes, Murray, Temple, Tuokko, & Wharf Higgins, 2012); (4) veterinarian prescription on dog walking (Byers, Wilson, Stephens, Goodie, Netting, & Olsen, 2014); (5) the use of online social networks to promote neighborhood dog walking (Schneider et al., 2015); and (6) the delivery of an online dog walking intervention (Richards, Ogata, & Cheng, 2016).

Consistent with findings from several cross-sectional studies (Westgarth et al., 2014), overweight dog owners who participated in exercise with their overweight dogs reported that their dogs provided them with social support/motivation/enjoyment, acted as buddy, played the role of consistent initiator, and evoked parental pride within the owners (Kushner et al., 2006). This motivational, social, and enjoyable human-dog

partnership served an important role when it came to dog owners exercising with their dogs, and the study culminated in significant weight loss for both dog owners and their dogs. As well, encouraging family dog walking through the application of behavior change strategies, making modifications to the environment, and using parental support showed promising results in increasing the total volume of physical activity among children, and increased the intensity of exercise their family dogs received (Morrison et al., 2013).

Additionally, the use of in-person veterinarian counseling to encourage dog walking (Byers et al., 2014), the dissemination of a one-time educational brochure listing the outcome benefits of dog walking for canine health (Rhodes et al., 2012), in-person attendance at neighborhood group dog walks arranged through social media meet-up groups (Schneider et al., 2015), and the delivery of bi-weekly/weekly email messages targeting social cognitive constructs of self-efficacy, social support, goal-setting, and listing benefits/barriers of dog walking (Richards et al., 2016) proved effective and resulted in increased walking among dog owners who received the intervention in these randomized controlled trials. Interestingly, control group participants in two randomized controlled trials (Byers et al., 2014; Rhodes et al., 2012) also increased their walking from just participating in the study. From these collective findings, it can be concluded that there is certainly value and utility in incorporating dog walking/dog-inclusive interventions to promote physical activity among less active or sedentary dog owners, and that a combination of strategies targeting behavior change, the environment, social support, enjoyment, and outcome benefits of regular dog walking and physical activity –

delivered both in-person and/or online – can be effectively used in dog walking and physical activity promotion among dog owners.

Psychological theories in dog walking research

Numerous studies and reviews have examined dog walking as a means to increase physical activity and looked into the correlates associated with dog walking (Christian et al., 2016; Westgarth et al., 2014); however, not all dog walking research conducted thus far have been based on psychological theories or conceptual models. To date, several of the psychological theories and conceptual models that have backboned some of the dog walking and physical activity research include: (1) socio-ecological theory (SET); (2) social-cognitive theory (SCT); (3) theory of planned behavior (TPB); (4) self-determination theory (SDT); and (5) the multi-process action control (M-PAC) framework.

A recent review conducted by Westgarth et al. (2014) on 31 dog walking studies utilized the socio-ecological theory (SET) approach to encapsulate the correlates of dog walking. The SET approach considered the interplay between the individual and their social and physical environments with three main principles underpinning this approach: (1) health and illness are determined by multiple individual and environmental factors; (2) the interplay between individuals and the settings in which they work, live and recreate; and (3) an understanding of these factors require a multidisciplinary perspective of health (Cutt, Giles-Corti, Knuiman, & Burke, 2007). The SET examination of dog

walking behavior captured a comprehensive overview of the correlates associated with dog walking and looked into the multiple layers within a broad spectrum involving the individual dog owner, the dog, dog-owner-and-dog relationship, familial and social relationships, the neighborhood, and the natural, physical, and policy environments (Westgarth et al., 2014).

The social-cognitive theory (SCT) approach has been used in dog walking research (Richards et al., 2016; Richards, Ogata, & Cheng, 2017) with the underlying premise that dog walking behavior is influenced by relationships between personal factors, environmental influences, and behavioral attributes (Bandura, 1997). In SCT, constructs of self-efficacy and outcome expectations are believed to influence physical activity through goals, and structural/social reinforcements and barriers can increase or reduce the likelihood of health behavior changes (Bandura, 1997; Baranowski, Perry, & Parcel, 2002). Dog walking studies that have applied the use of SCT targeted specific SCT constructs using the following strategies: making time for dog walking/resisting relapse/overcoming barriers (self-efficacy), enlisting support from dog /family/friend (social support), goal-setting and self-monitoring (self-regulation), identifying/emphasizing owner- and dog-specific outcomes (outcome expectations/outcome values), and the dissemination of motivational messages (reinforcements) (Richards, McDonough, Edwards, Lyle, & Troped, 2013; Richards et al., 2016; Richards et al., 2017). Dog owners who received the SCT-based email-mediated intervention increased their walking without sacrificing other forms of physical activity, and they maintained this increase at 12 months (Richards et al., 2017).

The theory of planned behavior (TPB) (Ajzen, 1991) proposes that intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms (i.e., perceived social pressure to perform or not to perform the behavior), and perceived behavioral control (i.e., perceived ease or difficulty of performing the behavior, and which is assumed to reflect past experience and anticipated impediments and obstacles). When applied to dog walking research, TPB has sought to examine the intention to dog walk, enactment of dog walking behavior, perceived behavioral control, and subjective norms (Brown & Rhodes, 2006; Hoerster et al., 2011; Rhodes et al., 2012). In the study by Brown and Rhodes (2006), a sense of dog obligation was found to independently predict both intention to dog walk and dog walking behavior. However, because positive dog walking intentions do not always translate into actual dog walking behavior, and there lies different qualities of dog walking motivations among dog owners (Lim & Rhodes, 2016), examining additional psychological and motivational processes associated with dog walking appears to be necessary towards understanding the existing dog walking/physical activity intention-behavior gap among dog owners (Rhodes & Lim, 2016).

Self-determination theory (SDT) is a conceptual model applied to understanding the quality of motivation that underlies human behavior due to meeting needs for autonomy, relatedness, and competence (Deci & Ryan, 2000), and this theory has seen strong validation in physical activity research (Teixeira, Carraça, Markland, Silva, & Ryan, 2012). In SDT, it is argued that conditions supporting the individual's experience of autonomy, relatedness, and competence foster the most volitional and high quality

forms of motivation, and engagement of activities (Deci & Ryan, 2000). The SDT views motivation as a continuum from amotivation to purely extrinsic, to intrinsic, and this theory has been recently applied to dog walking research to understand the different qualities of dog owner motivations and their implications on dog walking behavior (Lim & Rhodes, 2016). Examples of different qualities of motivation in the realm of dog walking behavior are as follows: amotivation – "I think dog walking is a waste of time"; extrinsic – "others would not be pleased with me if I do not walk my dog"; introjected – "I feel like a failure if I do not walk my dog"; identified – "dog walking is good for my dog's health"; intrinsic – "dog walking is a pleasurable activity" (Lim & Rhodes, 2016). Lim and Rhodes (2016) conducted the first study using SDT in the examination of dog walking behavior and found that dog owners who felt a stronger sense of responsibility towards their dogs also reported higher intrinsic and identified regulations but not external or introjected regulation. This finding supported the notion that dog owners' engagement of dog walking was not performed solely out of obligation or guilt but from the achievement of personally valued outcomes similar to the objectives found within autonomous forms of regulation. Furthermore, dog owners who valued the benefits of dog walking and who genuinely enjoyed walking with their dogs engaged in more walking per week than dog owners who did not. As such, it was concluded that higher qualities/forms of motivation among dog owners were associated with increased weekly dog walking volume.

The M-PAC framework (Figure 1) is a reworking of contemporary research in physical activity, and an attempt to integrate several streams of work, and its behavior

change techniques for intervention are similarly shared from prior theories (Rhodes, 2017). Physical activity in the M-PAC schematic is viewed as a volitional behavior and one possibility among multiple behavioral options (Rhodes, 2017). Within this framework, regulatory processes (i.e., behaviors or cognitions that people enact to translate their intentions into physical activity behavior), reflective/motivational processes (i.e., consciously deliberated expected consequences of performing physical activity and the act of behavioral performance), and reflexive processes (i.e., impulsive, or less reasoned, constructs that influence action control most often through learned associations and are triggered through particular circumstances and stimuli) are targeted to elicit behavior change (Rhodes, 2017).

Most recently, Rhodes and Lim (2016) conducted the first dog walking cross-sectional study introducing the M-PAC framework to examine the intention-behavior gap in daily walking behavior among dog owners. It was found that 45% out of 73% of intenders were unsuccessful in translating their intentions into behavior (i.e., action control) (Kuhl, 1984). Thus, even though intention formation is a necessary process when it comes to dog walking behavior, intention alone may be insufficient to enact walking among dog owners. Further, Rhodes and Lim (2016) found that affective judgments, behavior regulation, identity, and habit differentiated non-intenders, unsuccessful intenders, and successful intenders – that is, these M-PAC constructs explained those who succeeded from those who merely intended but did not succeed. It was concluded that frameworks/models that propose intention as the bridge to behavior may not be as useful as they separate intention translation from intention formation. In light of this,

Rhodes and Lim (2016) recommended that dog walking promotion may benefit from both intention formation and action control interventions.

1:3 – Situating the Current Study

The purpose of this study was to further examine the use of the M-PAC framework in a 9-week feasibility randomized controlled trial involving the program delivery of six weekly scheduled instructor-led group dog walks supplemented with M-PAC construct intervention strategies through assigned worksheets.

Dog walking is a viable means to increase physical activity and prevent diseases (Christian et al., 2016) and a large number of cross-sectional studies on dog walking have been published to date. However, dog walking interventions involving randomized controlled trials have been relatively scarce (Christian et al., 2016; Westgarth et al., 2014), and despite intervention efforts to promote increased dog walking among dog owners, a large 45% intention-behavior gap doggedly persists (Rhodes & Lim, 2016). Given that 50% of all dog owners are not walking their dogs (Christian et al., 2013), and 60% of those who walk their dogs are not walking at sufficient intensities to reap health benefits (Lim & Rhodes, 2016), there is a pressing need to bridge existing gaps and rectify the physical inactivity phenomenon (Colley et al., 2011).

Admittedly, almost no one enacts physical activity without an intention (Rhodes & de Bruijn, 2013a), and although intention is necessary, it is insufficient when it comes

to understanding physical activities among many people (Rhodes, 2017). The argument that health behaviors may be more a process with intention as a critical but insufficient aspect in behavior change has been supported (Rhodes & de Bruijn, 2013b; Schwarzer, 2008; Sniehotta, Presseau, & Arau jo-Soares, 2014). Action control models allow for the separation of decisional direction (i.e., intention), followed by commitment to the decision and volitional planning and self-regulation concepts proposed by Bagozzi (1992). Action control models that attempt to understand who translates intentions into behavior in order to foster effective interventions is a viable and important area of future physical activity research as the discipline evolves from a consideration of intention as the panacea of action to intention as a mere marker in the process of behavioral engagement (Rhodes & Yao, 2015).

As such, the M-PAC framework presents as a suitable conceptual model to apply to this study as it is designed with physical activity intervention in mind with specific target approaches built into the schematic in order to represent a pragmatic structure for practitioners (Rhodes, 2017). The M-PAC schematic represents an ordered acquisition of reflective/motivational, regulatory, and reflexive processes over time, and each is expected to have some mediated feedback onto behavior and intention along with their own independent effect (Rhodes, 2017). The introduction and application of the M-PAC framework/measures in dog walking research has been fairly recent, and its utility – although not yet examined in any dog walking intervention trials to date – has shown efficacy in family physical activity promotion and personal physical activity (Kaushal, Rhodes, Spence, & Meldrum, 2017; Rhodes, Naylor, & McKay, 2010). However, its pilot application in an observational dog walking study (Rhodes & Lim, 2016) and its findings

warrant valid and further examination of this particular framework within dog walking research and to put it to test using a randomized controlled trial design. Given the novelty of this approach in dog walking intervention research, this study is exploratory in nature, and its application and findings will serve to inform future studies.

The M-PAC framework amalgamates physical activity constructs from past validated and reliable assessments, and proposes the following testable assumptions (Rhodes, 2017): (1) action control should be linked more to reflective/motivational processes of affective judgments and perceived opportunity than instrumental attitudes/outcome expectations and perceived capability. Intention formation could be linked to any of these four reflective/motivational constructs; (2) action control in the initiation of physical activity should be linked to reflective/motivational constructs and regulation behaviors more than reflexive constructs. By contrast, long-term physical activity patterns should be linked to reflexive constructs and include reflective/motivational constructs and regulatory behaviors; (3) reflective/motivational constructs should precede regulatory behaviors, although these are likely to have reciprocal deterministic relationships across time; (4) reflective/motivational and regulatory processes should precede reflexive processes (due to the time needed to form these associations), although these are expected to have reciprocal deterministic relationships across time.

Reflective/motivational processes are the consciously deliberated expected consequences of performing physical activity and the act of behavioral performance;

regulatory processes are behaviors or cognitions that people enact to translate their intentions into physical activity behavior, with specific strategies varying across individuals, behaviors, or populations, but are likely to include setting goals, coping, planning, enlisting support, self-monitoring, and prioritizing, among others; and reflexive processes are impulsive, or less reasoned, constructs that influence action control most often through learned associations and are triggered through particular circumstances and stimuli (Rhodes, 2017).

This present trial sought to examine dog walking behavior and elicit positive dog walking and physical activity behavior change among program participants by targeting M-PAC constructs associated with reflective/motivational, regulatory, and reflexive processes.

The primary, secondary, and tertiary research questions, and each of their accompanying hypothesis, are as follows:

Primary research question:

Will a 9-week randomized controlled trial involving weekly scheduled instructor-led group dog walks supplemented with M-PAC construct intervention strategies be feasible and acceptable to encourage increased dog walking and physical activity among dog owners in Greater Victoria, BC? Feasibility and acceptability will be determined by

response, recruitment, retention, and adherence rates, and participants' feedback gathered from the program evaluation survey.

Primary hypothesis:

It is feasible and acceptable for a 9-week randomized controlled trial involving weekly scheduled instructor-led group dog walks supplemented with M-PAC construct intervention strategies to encourage increased dog walking and physical activity among dog owners in Greater Victoria, BC. Feasibility and acceptability are determined by response, recruitment, retention, and adherence rates, and participants' feedback gathered from the program evaluation survey.

Secondary research question:

Will receiving a program of six weekly scheduled instructor-led group dog walks supplemented with M-PAC construct intervention strategies assist dog owners in the experimental group in achieving higher frequencies and intensities, and longer durations of dog walks/physical activity with dog per week compared to dog owners in the waitlist-control group who do not receive the program?

Secondary hypothesis:

Receiving a program of six weekly scheduled instructor-led group dog walks supplemented with M-PAC construct intervention strategies would assist dog owners in the experimental group in achieving higher frequencies and intensities, and longer durations of dog walks/physical activity with dog per week compared to dog owners in the waitlist-control group who do not receive the program.

Tertiary research question:

Is the M-PAC framework an appropriate conceptual model to apply towards the examination of dog walking behavior among dog owners with its appropriateness evidenced and measured through positive changes in program participants' reflective/motivational, regulatory, and reflexive processes across time?

Tertiary hypothesis:

The M-PAC framework is an appropriate conceptual model to apply towards the examination of dog walking behavior among dog owners with its appropriateness evidenced and measured through positive changes in program participants' reflective/motivational, regulatory, and reflexive processes across time.

Chapter 2 – Methods

2:1 – Trial Design

This 9-week feasibility study utilized an open parallel randomized controlled trial design. Feasibility studies are used to determine whether an intervention is appropriate for further testing on a larger scale, and they enable researchers to assess whether or not the ideas and findings can be shaped to be relevant and sustainable (Bowen et al., 2009). Questions pertaining to safety, optimal dose (i.e., treatment intensity, frequency, duration), and the sequencing of treatment all can be tested efficiently in feasibility experiments; ideally, the intervention will have been shown to be efficacious and effective before being implemented broadly (Bowen et al., 2009). Advantages of conducting feasibility studies include the following (Polit & Beck, 2011; van Teijlingen & Hundley, 2002): (1) assess the adequacy of study methods and procedures; (2) develop and assess the adequacy and quality of research instruments and questionnaires; (3) assess participant recruitment strategies; (4) identify potential participant retention problems; (5) assess the research protocol for realistic execution; (6) assess the strength of key variable relationships; (7) identify confounding variables that should be controlled; (8) assess the effectiveness of sampling techniques; (9) determine study resources, such as training materials, research staff, project costs, and study budget planning; (10) assess outcome variability to estimate study sample size; (11) assess proposed data analysis; (12) assess preliminary evidence and its justification for a larger-scale study; and (13) provide evidence to funding agencies proving that the study is

feasible and worthy of research funding. This feasibility study followed CONSORT guidelines for pilot and feasibility trials (Eldridge et al., 2016).

This study involved two groups of dog owner participants (experimental group and waitlist-control group) and utilized three pre-selected monitoring periods for data collection: (1) baseline, (2) week 6 (end-of-program), and (3) week 9 (follow-up). The primary researcher screened, enrolled, and randomized eligible participants into either the experimental group or the waitlist-control group using a 1:1 allocation ratio. This was done to ensure that equal numbers of participants were assigned to each group, and the random allocation was performed using mixed methods randomization comprising of blind manual draws and computerized randomization (Research Randomizer, 2016). Quantitative data were collected using pedometers (with accompanying step count tracking log sheets provided to participants by the researcher) and online questionnaires administered through Fluid Surveys at each monitoring phase (i.e., a total of three online questionnaires). Due to technical issues, week 9 data for *affective judgments* (part of "tertiary outcomes") were not collected in the final online questionnaire.

A program evaluation survey was administered to program participants upon completion of the program to assess the acceptability of the program. The survey consisted of open-ended questions asking for participants' feedback and closed-rated questions asking about participants' overall satisfaction with regards to various aspects of the program, program components and effectiveness, worksheets content and effectiveness, and program effectiveness. Please see Table 7 and Table 8 for tabular

presentations of program evaluation responses. Participants' responses given in the program worksheets (i.e., assigned M-PAC constructs worksheets that formed part of the intervention program) contributed added feedback related to the program and provided rich detail of each participant's psychological processes during program participation. Please see Table 6 for a tabular presentation of participants' worksheet responses.

The program administered the following strategies aligned with M-PAC objectives:

Reflective/motivational processes

Within the M-PAC framework, reflective/motivational processes are represented by the *capability, outcome expectations (human and dog), opportunity,* and *affective judgments* constructs. *Capability, outcome expectations (human and dog),* and *dog responsibility* were not explicitly targeted in the program. However, an identical educational handout (Appendix G) listing suggestions for skill building (*capability*) when it comes to dog walking and the benefits of regular dog walking for dog owner and dog (*outcome expectations – human and dog*) was handed out to both experimental and waitlist-control group participants before the start of the program. *Opportunity* was targeted through the use of the assigned *opportunity/habit* worksheet by asking participants to identify and write down one-to-two daily cues that they could use as windows of opportunities within their day to walk their dogs. *Affective judgments* were targeted through the use of the assigned *enjoyment* worksheet by asking program

participants to cognitively reflect and write down (1) the enjoyable/motivational aspects of their dog walking sessions; (2) the pleasant social experiences they encountered when walking with their dog; (3) the specific locations and dog-friendly events/activities they enjoyed going to with their dogs; and (4) any other considerations/features that were important to them that would make dog walking more enjoyable for them.

Regulatory processes

Regulatory processes pertaining to the M-PAC construct of *planning* were targeted through the use of the assigned *planning* worksheet where participants were instructed on how to create detailed weekly plans for dog walking, create coping plans to back-up missed dog walking plans, and to set a reboot day each week to create new plans and coping strategies if previous coping plans had failed. Additional strategies targeting volitional self-monitoring and behavioral regulation included asking participants to (1) wear pedometers, self-monitor their daily step counts onto log sheets provided, and answer self-report online questionnaires; (2) attend (at least three out of) six non-mandatory weekly scheduled instructor-led group-dog walks; (3) complete assigned worksheets and submit them to the instructor within a reasonable time frame (preferably before each following walk); (4) refer regularly to these assigned worksheets; (5) apply strategies listed in the worksheets for the duration of their participation in the program, and (6) self-monitor/regulate/increase their weekly dog walking frequency, intensity, and duration.

Reflexive processes

The M-PAC schematic includes two primary reflexive constructs – *habit* and *identity* (Rhodes, 2017). *Habit* represents routine behavioral action that is under lowered conscious awareness and executed from cues (Gardner, 2015; Verplanken, 2006). *Identity* is the conscious association of an individual with a particular role through the process of self-categorization (i.e., exerciser) and the expectations associated with that role (Stets & Burke, 2000) where behavioral action is (1) from selective processing of identity relevant information and shielding of discrepant information (Markus, 1977), or (2) initiated to reduce dissonance in contexts that trigger an awareness of one's role identity (i.e. exerciser) with a discrepant action (e.g., not exercising) (Stryker & Burke, 2000).

It has been shown that in order to establish an exercise habit among new exercisers the approximate timeline of six weeks is required (Kaushal & Rhodes, 2015). Following this timeline recommendation, reflexive processes of *habit* were targeted in this trial through the (1) delivery of a six-week group dog walking program, (2) use of the assigned *opportunity/habit* worksheet asking participants to identify daily cues as regular opportunities to walk their dog, and (3) to follow through those cues immediately with the action of walking one's dog in an effort to adopt this into a habitual behavior and cement it into the long term (i.e., maintenance). Reflexive processes of *identity* were targeted through the use of the assigned *identity* worksheet (1) to form, strengthen, and prioritize one's dog walking exercise identity; and (2) to regularly affirm and commit to one's dog walking exercise identity.

Dog responsibility, although not an M-PAC construct on its own, is closely tied to the identity of "being a responsible dog owner/dog parent" (Rhodes & Lim, 2016) with the resulting action of dog walking performed regularly with the expectation to achieve the benefits of regular dog walking (*outcome expectations*). Thus, for the purposes and intent of this dog walking feasibility trial, *dog responsibility* was categorized as a reflexive process due to its intimate connotations with the M-PAC construct of *identity*. *Dog responsibility* was not specifically targeted in the program but intervention strategies targeting *identity* may have inadvertently also targeted *dog responsibility.*

2:2 – Eligibility Criteria

Two sets of eligibility criteria (one for dog owners and the other for their dogs) were determined, and both sets had to be met to be deemed eligible to participate. This was necessary to ensure that the study recruited from the target population aligned with the study objectives, and to prevent potential risks to both humans and dogs participating in the study.

Dog owners' eligibility to participate

Dog owners were English speaking male and female adults aged 18+ years, living in Greater Victoria, BC, Canada (or surrounding vicinities and who were willing to travel to Greater Victoria, BC, for the scheduled weekly group dog walks if randomized into the experimental group), who owned at least one healthy and friendly dog aged six months

and above. Participants must not have been meeting a minimum of 150 minutes of MVPA per week with or without their dog (see Appendix B: Screening Form), and must have been medically cleared to participate using the Physical Activity Readiness Questionnaire Plus Form (PAR-Q Plus Form) (Appendix C: Physical Activity Readiness Questionnaire Plus Form). If participants had answered "yes" to any questions on the PAR-Q Plus Form, they obtained written medical clearance from their physician to participate in the study prior to participation using the CSEP Physician Clearance Form (Appendix D: CSEP Physician Clearance Form). The costs of obtaining medical clearance to participate were borne solely by the participants. Participants must also have answered "yes" to the "Are you willing to be randomized into either the experimental or the waitlist-control group?" question on the Screening Form (Appendix B).

Dogs' eligibility to participate

Dogs were aged six months or above, spayed/neutered, healthy, friendly to humans and other dogs, and must not have bitten or displayed aggression towards humans and dogs. Dogs aged 7 years and above, and/or dogs with health issues that could have been exacerbated through study participation in any way, were required to be medically cleared by their veterinarian prior to participation. Accepted forms of veterinarian clearance for dogs included direct email correspondence and written notes from their respective veterinarians/veterinary clinics. The costs of obtaining veterinary clearance for dogs (if any) were borne solely by the dog owners.

2:3 – Intervention

Participants in both groups were emailed one identical educational handout (Appendix G) listing the benefits of regular dog walking for dog owners and dogs (*outcome expectations – human and dog*) and suggestions for skill building (*capability*) before the start of the program. Only participants in the experimental group ("program participants") received the intervention program while participants in the waitlist-control group did not. The program was offered to waitlist-control group participants at the end of the study when all data collection was complete for both groups. The intervention program consisted of six weeks of scheduled instructor-led group dog walks that took place once a week, and these walks were supplemented with four weekly assigned worksheets based on M-PAC constructs (see Appendices H to K) that program participants were asked to complete and submit to the instructor for the first four weeks of the program. The six-week program timeline was selected based on prior research findings that an approximate timeline of six weeks was required to establish an exercise habit among new exercisers (Kaushal & Rhodes, 2015).

Weekly scheduled instructor-led group dog walks

The group dog walks took place once a week on Sunday evenings in the Gorge/ Park/Tillicum area in Greater Victoria, BC. Program participants and their dogs met the instructor at the same venue and at the same appointed time each Sunday evening for six weeks. At the start of each group walk, the instructor provided a brief verbal overview of

the M-PAC construct(s) related to the assigned worksheet which participants received that week. Instructions and ideas on how each specific construct applied to dog walking were explained verbally to the participants in attendance before the commencement of each walk.

The walking program applied in this study was adapted from Wilbur et al. (2001) with modifications created/added by the certified and experienced fitness instructor who led the weekly group dog walks. Each walk consisted of a 10-minute warm-up walking at a leisurely pace, followed by five minutes of simple mobility and range-of-motion exercises (e.g., shoulder rolls, toe-tapping on the spot), and a 35-minute workout segment consisting of three sets of 10-minute bouts of increased walking pace/intensity performed at each participant's preference and ability, before ending with a 10-minute cool-down segment walking at a leisurely pace. Participants were asked to take 1-minute breaks after each 10-minute bout of increased walking pace/intensity, and longer breaks were given to participants who required it. The break segments allowed the instructor to monitor group numbers and check in with each participant while allowing the slower participants the opportunity to recover and catch up with the group. To provide variety and keep the walks interesting, the routes of each group walk differed weekly with some routes consisting of more inclined terrains (versus flatter terrains) to offer program participants new and interesting sights, and opportunities to vary/increase their walking intensities if they wanted to.

For the first four weeks of the program, experimental group participants were emailed one M-PAC construct worksheet each week. A total of four M-PAC construct worksheets were disseminated electronically to the experimental group participants. At the start of each group walk during the first four weeks of the program, the instructor gave a verbal overview of the specific M-PAC construct related to the worksheet for that week, and provided instructions and ideas on how to complete that week's assigned worksheet. Program participants were encouraged to apply the worksheet ideas and suggestions during the week as well as over the course of their participation to create positive changes in their dog walking behavior. Participants were asked to submit their completed worksheets via email or hard copy to the instructor preferably before the start of their next group walk with the instructor, or within a reasonable time frame if they were out-of-town/busy and had to miss some of the walks.

Summary of worksheets

The *planning* worksheet titled "Making a Physical Activity Plan" (Appendix H) was disseminated via email to the experimental group participants at the start of the program (in the first week just before their first group dog walk). The objective of this worksheet was to provide suggestions to program participants on how to formulate detailed dog walking plans for each week by asking them to brainstorm their own ideas and create coping/back-up plans for when their initial plans go awry. Participants were also asked to set aside a reboot day to reset their plans at the start of each new week, and to re-strategize if any of their coping/back-up plans failed to provide resolutions in the

previous week. Examples of the guiding questions in this worksheet are as follows: (1) *What type of activities do you want to do with your dog?;* (2) *Where would you do these activities with your dog?;* (3) *When can you be active with your dog?*; (4) *How can you get there with your dog?;* (5) *How much time will you need for your activity?*; (6) *Do you need special clothing or equipment?;* (7) *What can you do to prepare for poor weather?*; (8) *What are some of the problems you may run into when carrying out your physical activity plans?*; and (9) *What are some ideas to solve your problems?*.

The *identity* worksheet titled "Exercise Identity Formation" (Appendix I) was disseminated via email to the experimental group participants in the second week of the program. The aim of the *identity* worksheet was to help participants self-identify, self-categorize, and prioritize their dog walking (or dog owner) exercise identity amongst other important identities each of them might have had in their daily lives (e.g., parent, employee, pianist, gardener, etc.). Participants were asked to rank their self-perceived identities in a hierarchical order from the highest to the lowest rank (or most important to the least), and to include descriptive details and adjectives for a more accurate reflection of those identities (e.g., "dedicated dog parent" as opposed to just "dog owner"). In the next step, participants were asked to insert their dog walking exercise identity within this hierarchy where their enactment of dog walking would be undertaken and followed through after higher-ranked identities but before lower-ranked identities. Following this task, participants were asked to think of ways they would/could celebrate their new dog walking exercise identity (e.g., buy a new leash/new walking shoes, take photos to share with friends, etc.). At the end of the worksheet, participants were asked to reaffirm their

dog walking exercise identity, prioritize their dog walking activity, and commit to this dog walking responsibility by signing off as follows: “I _____ (dog owner’s name) affirm that walking with ____ (dog’s name) will always be done before activities associated with lower-ranked identities”.

The *opportunity/habit* worksheet titled “Building a Dog Walking Routine” (Appendix J) was disseminated to program participants in the third week of the program. The aim of this instructional worksheet was to help program participants build daily opportunities for dog walking that would develop into a long-term habit of regular dog walking for them. Participants were asked to identify one to two cues that occurred separately once per day (e.g., after breakfast, before sunset) and describe how those cues acted as reminder strategies for them to walk their dogs upon their exposure to those cues. Understanding that participants’ daily schedules differed individually, participants were given the flexibility to list either one cue that presented as one window of opportunity per day for them to walk their dog for at least 30 minutes, or to list two different cues per day that would present as two separate opportunities for them to walk their dog for at least 15 minutes each time, thus totaling 30 minutes minimum of dog walking per day.

The *enjoyment* worksheet (Appendix K) was disseminated to program participants in the fourth week of the program. The objective of this worksheet exercise was to encourage participants to reflect on reasons that motivated them to walk their dogs, and to hone in on the pleasurable experiences of dog walking. In this worksheet, participants

were asked why dog walking was enjoyable for them, to list the enjoyable locations they liked walking their dogs at and the dog-friendly social events/activities they attended with their dogs, as well as write down any other considerations/factors that provided added motivation/enjoyment/pleasure to their dog walking sessions and experiences.

2:4 – Procedures

The study received ethical approval from the Human Ethics Research Board at the University of Victoria and official participant recruitment took place between May and July 2016. Physical posters were put up on notice boards within the university campus, selected Greater Victoria Public Libraries, local cafes (Starbucks, Good Earth), public and staff notice boards in grocery and pet stores (Thrifty's, Fairway, Save-On Foods, Root Cellar, Pet Smart), community and recreation centers, and faith-based organizations (e.g., churches). The call for participants was also posted on local canine and community Facebook groups and pages, and on the Behavioral Medicine Laboratory website (researcher's laboratory). Interested respondents who gave their contact information from a prior pilot recruitment drive that took place at a local pet event (Petapalooza) and on Facebook were also contacted via a mailing list. The university's media relations department launched a media tip tied to participant recruitment and the researcher was subsequently contacted/ interviewed by media regarding the study. Recruitment calls were disseminated through these interviews in print (websites/newspapers) and on air (television/radio). The researcher also conducted multiple sessions of in-person recruitment at dog parks and residential neighborhoods, with several of these sessions

undertaken while dog walking or jogging with her own dog. Handbills (i.e., downsized version of the study recruitment poster) (Appendix A) containing information about the study and contact information of the researcher were distributed during in-person recruitment, and study information packages were dropped off by the researcher into physical mailboxes upon request by interested parties who asked for more information.

The respondents who contacted the researcher with an expression of interest to participate were emailed details of the study (including description of the eligibility criteria and a visual flow chart explaining the randomization condition) and the following forms: (1) Screening Form, (2) PAR-Q Plus Form, and (3) CSEP Physician Clearance Form (to use if medical clearance was required). Respondents were asked to read through the forms, fill in and return the completed forms back to the researcher, and to clarify any questions they might have had with the researcher. Participants who were deemed eligible after the screening process were sent the Participant Consent Form (Appendix E) to peruse, ask questions (if any), sign off, and return to the researcher. After completing one week of baseline data collection, participants were randomly selected using mixed methods randomization comprising of blind manual draws and computerized randomization (Research Randomizer, 2016) and placed into either the experimental group or the waitlist-control group before the start of the program.

Participants who were vacationing and/or had atypical dog walking/physical activity schedules (e.g., were unusually more/less active compared to their typical weekly routine) were allotted delayed start dates; more flexibility was extended to waitlist-

control group participants in such circumstances as the waitlist-control group participants were not required to attend the scheduled group dog walks (the group dog walks had to begin on a set date as a group with a minimum of three participants, similar to cohort-style commencement). Three participants in the experimental group were delayed by one week (n = 2) and two weeks (n = 1), respectively, whilst two participants in the waitlist-control group were delayed by three to four weeks, respectively, due to rolling recruitment and out-of-town vacations. Additional group dog walks were offered to the three experimental group participants with delayed starts to make up a total of six walks for each participant; however, one participant had to work and declined the offer, one participant failed to respond, and one participant declined the offer due to the lack of interest from the other two participants to make up the "group aspect" of the group walks which was set at a minimum of three participants. Given the small number of eligible participants who enrolled into the study, coupled with the "group aspect" requirement, and the small experimental group size as a result of the 1:1 randomization, administering official waves or staggered starts with a fixed number of participants for each wave/start was not an option. Notwithstanding, substantial efforts were invested and continued in conducting rolling recruitment albeit with trickling interest and low number of inquiries post-media coverage and as summer transitioned into the fall season (i.e., change of weather, start of school and return to work for many people).

In appreciation of participants' time and contribution to the study, participation incentives such as goodie bags consisting of human and dog health products, discounts off pet products (online and in-store retail), and special rates for canine first aid courses

and emergency stickers were offered to participants. Draw prizes consisting of doggy bandanas, convertible Frisbee-dog water dish, and gift certificates to redeem health-related services/products (registered massage therapy, dental examination and cleaning, CAD $100 voucher for dog-friendly cargo bicycles) were given out at the completion of the study. Participation incentives and draw prizes were donated out of goodwill voluntarily by reputable/quality service providers whom the researcher had sourced and approached, the study was not funded or sponsored in any way by these service providers, and none of the incentives or prizes offered were coercive in nature.

2:5 – Primary Measures

Recruitment rate

Recruitment rate (%) was calculated as the number of enrolled/randomized participants divided by the number of interested respondents who contacted the researcher with an expression of interest to participate in the study.

Retention rate

Retention rate (%) was calculated as the number of sample participants retained in the final analysis divided by the number of eligible participants screened and enrolled into the study.

Adherence rate

The adherence rate (%) was calculated by dividing the number of compliant participants by the total number of participants retained for final analysis.

Attendance rate at program group dog walks

The attendance rate was calculated as the average number of attendees at each group dog walk. Participants' attendance at each of the six group dog walks was added up and divided by six, and the mean (*SD*) attendance rate was obtained.

Program evaluation

A program evaluation was conducted upon study completion and the evaluation survey was administered to the experimental group participants in the third and final online questionnaire. Program participants were asked for their feedback regarding different components and aspects of the program/study using open-ended and closed-rated questions. The option to email the researcher with questions, comments, and feedback was extended to all participants (in both experimental and waitlist-control groups) before, during, and upon completion of the study. Program evaluation questions were adapted from program satisfaction questions administered in the telephone-delivered "CanChange" pilot study (Hawkes, Gollschewski, Lynch, & Chambers, 2009) that asked participants (colorectal cancer survivors) to provide satisfaction ratings for

overall program, health coach, handbook, and to rate whether (1) *the program addressed their issues*; (2) *participating in the program helped them to deal more effectively with their problems*; (3) *the program made them more motivated to make positive changes in their life*; (4) *the program made them more positive or hopeful about their future*; and (5) *if they would recommend the program to other colorectal cancer survivors*. The researcher then formulated additional adapted evaluation questions to address the various aspects and multiple components specific to this dog walking program. The full list and description of these adapted program evaluation questions can be found below.

Open-ended questions

Program participants were asked the following open-ended questions and comment boxes were provided for them to fill in their responses.

Program/Intervention – The following five questions were asked to gather feedback from participants regarding their reason(s) for participation, their favorite/least favorite aspects of the program, how they would describe the program and what aspects of the program they would like kept and/or changed: (1) *I participated in this program/study because* _____ ; (2) *What was your favorite aspect of the program and why?*; (3) *What was your least favorite aspect of the program and why?*; (4) *If you were to describe this program to a friend or family member, what three words best capture your experience?*; and (5) *If you were in charge of designing this program in the future,*

what three aspects would you recommend be kept, and what three aspects would you recommend be changed and why?

Attendance – The following one question was asked to obtain insight into the reasons why participants might have missed any of the scheduled group dog walks: (1) *If you have missed any of the six group walks during the study, please kindly provide us with helpful insight as to why the sessions were missed.*

Preference for Program Delivery – The following one question was asked to understand participants' preferences for different methods of program delivery that would be helpful to steer future directions of similar studies: (1) *Compared with in-person scheduled group dog walks led by an instructor, would an internet-based (online) or telephone-based program be more effective and/or preferred? And why?*

Closed-rated questions

Program participants were asked to rate their responses on a scale of 1 (strongly disagree) to 5 (strongly agree) for Likert Scale questions categorized under the following headings: *Overall Satisfaction*, *Program Components and Effectiveness, Worksheets Content and Effectiveness*, and *Program Effectiveness*. An accompanying comment box was provided after each category for participants to offer additional feedback based on their rated responses to the questions asked in that category.

Overall Satisfaction – The following eleven questions were asked pertaining to participants' overall satisfaction: (1) *The use of the pedometer device*; (2) *Worksheets and supplementary materials*; (3) *Number of group walks (i.e., six walks);* (4) *Length of each group walk session (60-75 minutes)*; (5) *Location and routes of the group walks*; (6) *Time and day of the group walks*; (7) *Methods of communication and information dissemination*; (8) *The facilitator/instructor*; 9) *Participation incentives and draw prizes*; (10) *Troubleshooting issues and resolutions provided*; and (11) *Pick-up/drop-off of pedometers, study materials, etc*.

Program Components and Effectiveness – The following ten questions were asked regarding the study's program components and their effectiveness: (1) *The group walks were useful in helping me meet the study objectives*; (2) *I enjoyed attending the group walks*; (3) *I would recommend the group walks to other dog owners*; (4) *The pedometer device was easy to use*; (5) *Wearing the pedometer was useful in helping me meet the study objectives*; (6) *Tracking my daily step counts on the log sheets provided was useful in helping me meet the study objectives*; (7) *I would recommend the use of pedometer devices to other dog owners*; (8) *I would recommend tracking daily step counts on log sheets to other dog owners*; (9) *The program helped increase my motivation to make positive changes in my dog walking and physical activity behavior*; and (10) *The program resulted in positive changes in my physical activity and dog walking behavior*.

Worksheets Content and Effectiveness – The following twelve statements relating to the program worksheets' content and effectiveness were presented to participants for

scoring: (1) *The contents of the Planning worksheet provided new information/strategies and were useful to me*; (2) *I utilized the Planning worksheet regularly to make dog walking plans*; (3) *I would recommend the Planning worksheet to other dog owners*; (4) *The contents of the Exercise Identity worksheet provided new information/strategies and were useful to me*; (5) *I utilized the Exercise Identity worksheet and reaffirmed my dog walking identity regularly*; (6) *I would recommend the Exercise Identity worksheet to other dog owners*; (7) *The contents of the Opportunity & Habit (cueing) worksheet provided new information/strategies and were useful to me*; (8) *I utilized the Opportunity & Habit (cueing) worksheet regularly when making dog walking plans*; (9) *I would recommend the Opportunity & Habit (cueing) worksheet to other dog owners*; (10) *The contents of the Enjoyment worksheet provided new information/strategies and were useful to me*; (11) *I utilized the Enjoyment worksheet regularly when making dog walking plans*; and (12) *I would recommend the Enjoyment worksheet to other dog owners*.

Program Effectiveness – Each of the following five statements, starting with "*As a result of participating in the study …*" was presented to participants for rating: (1) *I am now walking more with my dog per week*; (2) *I am now more physically active with my dog per week*; (3) *I am now more physically active overall per week*; (4) *I am now more aware of the different intensity levels involved in the physical activities I engage in*; and (5) *I now would like more weekly scheduled group dog walks led by an instructor*.

2:6 – Secondary Measures

Pedometry was used as the objective measure for step count data. Participants in the experimental and waitlist-control groups were asked to wear the Yamax Digi-Walker SW 200 device for seven days straight (two weekend days, five weekday days) starting from the time they awoke to when they went to bed. Participants were asked to monitor their daily step counts reflected in the pedometer device and record their step count numbers onto log sheets (provided to them) at the end of each day. Participants were asked to make up for any missed full day of wearing the pedometer, and a step count conversion chart listing approximate step counts for a variety of activities was provided to participants to help estimate step counts missed in situations when they forgot to wear their pedometer for a few hours during a monitoring day. Participants in the experimental group were encouraged to monitor/record their step counts daily for six weeks (not just during the three monitoring phases) if they wanted to as part of self-monitoring/self-regulation objectives. However, this was not a mandatory requirement due to the demanding nature of such a task.

The Yamax Digi-Walker SW 200 pedometer model was selected for use in this study due to its simple and non-evasive features. The Yamax Digi-Walker SW 200 pedometer has been utilized in many physical activity studies and has been tested for validity and accuracy in determining step counts; this model of pedometer has also shown a strong relationship (r = 0.80 – 0.90) under laboratory conditions with more expensive accelerometers (Tudor-Locke, Williams, Reis, & Pluto, 2002). As well, pedometers have

been shown to have a strong correlation with self-report physical activity measures (De Cocker, De Bourdeaudhuij, & Cardon, 2008), and the decision to use pedometers over accelerometers in this study was undertaken so as to reduce the inconvenience for participants to pick-up/return the accelerometers before and after each monitoring phase for specialized data download and battery recharging. This was an important consideration to prevent attrition, and to reduce burden on the participants, especially for participants who lived out-of-town, lived further away from the researcher's lab and/or the group walk venue (an alternative venue for pick-up/drop-off), and/or participants who had busy schedules. Placing pedometers with participants and allowing them uninterrupted daily and continued access to the devices also allowed participants to self-monitor and track their daily step counts for days that did not fall within the three monitoring phases, if they wanted to so. This beneficial feature of using pedometers over accelerometers also aligned with the regulatory objectives of the M-PAC framework used in this study.

Three online self-report questionnaires were administered to the experimental and waitlist-control group participants through the Fluid Surveys platform. Demographic information such as age, sex, race/ethnicity, height and weight, marital status, employment status, annual income, education level, health status, and smoking status were asked in the baseline questionnaire. Dog-related demographic information such as age (in months), size, energy level, training history, breed type(s), health status, and weight were also asked at baseline. With the exception of the first questionnaire that was administered at the start of the baseline monitoring week, the second and third

questionnaires were administered at the end of week 6 and week 9, respectively. In all three questionnaires, participants were asked to recall and self-report their past week's *dog walking*, *physical activity with dog*, and *physical activity without dog*.

Dog walking and physical activity measures

Dog walking, *physical activity with dog*, and *physical activity without dog*, were each separately measured using an adapted version of the Godin Leisure-Time Exercise Questionnaire (GLTEQ) (Godin & Shephard, 1997), based on prior walking research (Rhodes, Brown, & McIntyre, 2006b; Rhodes, Courneya, Blanchard, & Plotnikoff, 2007) and dog-walking studies (Brown & Rhodes, 2006).

Participants were asked to recall their average weekly *dog walking*, *physical activity with dog*, and *physical activity without dog* frequency and duration over the past week. *Dog walking* consisted strictly of leisure time dog walking only which participants engaged in with their dog over the past week. *Physical activity with dog* included all leisure time physical activities participants engaged in with their dog over the past week, and examples of these activities could include hiking with dog, running with dog, cycling with dog, and swimming with dog. *Physical activity without dog* comprised of all leisure time physical activity participants engaged in without their dog over the past week. These three distinct categories were set in place to provide added clarity when assessing behavioral outcomes given that dog walking was the primary mechanism targeted at for increased physical activity for dog owners in this study.

Each of the three separate categories utilized the adapted GLTEQ measure and contained three open-ended questions asking for the average frequency and duration of mild, moderate, and strenuous (vigorous) intensity leisure-time *dog walking*, *physical activity with dog*, and *physical activity without dog* during the past week, accordingly. Descriptions of mild, moderate, and strenuous (vigorous) intensities were provided. Only responses to moderate-vigorous (MV) intensities for all three categories were analyzed in accordance with public health recommendations (Lim & Rhodes, 2016; Rhodes & Lim, 2016; World Health Organization, 2017).

2:7 – Tertiary Measures

Dog responsibility measure

Dog responsibility was measured using three items adapted from Brown and Rhodes (2006): (1) *I feel pressure from my dog to walk him/her*; (2) *I feel an obligation to walk my dog regularly*; and (3) *I feel a responsibility to walk my dog regularly*.

Multi-process action control (M-PAC) measures

Apart from *intention*, eight other M-PAC constructs were formulated as Likert Scale items and scored from 1 (strongly disagree) to 5 (strongly agree). The reliability scale of each construct at baseline, week 6, and week 9 are listed in Table 3.

Intention was measured using one item from Courneya (1994): *I intend to walk my dog ____ times over the next week.*

Capability was measured using two items adapted from Rhodes and colleagues (Rhodes, Blanchard, & Matheson, 2006a; Williams & Rhodes, 2016): (1) *I am physically able to walk my dog regularly if I wanted to*; and (2) *I am capable to walk my dog regularly if I wanted to*.

Human outcome expectations (human OE) was measured using three items adapted from the Dogs and Physical Activity Tool (DAPA Tool) (Cutt, Giles-Corti, Knuiman, & Pikora, 2008a): (1) *I walk my dog to maintain/improve my health*; (2) *Walking my dog is good for my well-being*; and (3) *Walking my dog provides me with social advantages.*

Dog outcome expectations (dog OE) was measured using three items from the Dogs and Physical Activity Tool (DAPA Tool) (Cutt et al., 2008a): (1) *Walking my dog makes him/her behave better*; (2) *Walking my dog is good for his/her well-being*; and (3) *Walking my dog keeps my dog healthy.*

Opportunity was measured using two items adapted from Rhodes and colleagues (Rhodes et al., 2006a; Williams & Rhodes, 2016): (1) *I have the opportunity to walk my dog regularly if I wanted to*; and (2) *I have enough free time in my schedule to walk my dog regularly if I wanted to do so.*

Affective judgments was measured using four items adapted from the intrinsic regulation scale from the Behavioral Regulations in Exercise Scale-2 (Markland & Tobin, 2004): (1) *I walk my dog because it's fun*; (2) *I enjoy my dog walking sessions*; (3) *I find dog walking a pleasurable activity*; and (4) *I find dog walking a satisfying activity.*

Planning was measured using the following six items adapted from Sniehotta, Schwarzer, Scholz, and Schuz (2005): (1) *I kept track of my dog walking in an exercise diary or log over the past week (i.e., personal exercise diary/log)*; (2*) I kept track of my dog walking in an exercise diary or log over the past week (i.e., study-related log sheets)*; (3) *I set short-term (daily or weekly) goals for dog walking over the past week*; (4) *I made detailed plans regarding what I would do if something interfered with my plans to engage in dog walking over the past week*; (5) *I reserved time in my daily schedule for regular dog walking over the past week*; and (6) *I made plans concerning "when", "where", "what" and "how" I was going to engage in regular dog walking over the past week.*

Identity was measured using the following nine items adapted from the Exercise Identity Scale (Anderson & Cychosz, 1994): (1) *I consider myself someone who is physically active with my dog*; (2) *When I describe myself to others, I usually include my involvement in physical activity with my dog*; (3) *I have numerous goals related to being physically active with my dog*; (4) *Being physically active with my dog is a central factor to my self-concept*; (5) *I need to be physically active with my dog to feel good about myself*; (6) *Others see me as someone who is physically active with their dog*; (7) *For me, being physically active with my dog means more than just exercising*; (8) *I would feel a*

real loss if I were forced to give up being physically active with my dog; and (9) *Being physically active with my dog is something I think about often.*

Habit was measured using four items adapted from Gardner, Abraham, Lally, and De Bruijn (2012): (1) *I engage in dog walking automatically (e.g., without intending to do it)*; (2) *I engage in dog walking without having to consciously remember it*; (3) *I engage in dog walking without consciously thinking about it*; and (4) *I start dog walking before I realize I am doing it.*

2:8 – Analysis Plan

Feasibility analysis

Manual percentage calculations were performed for the following: (1) total number of interested responses received from the study recruitment drive. Individual names of all interested respondents who emailed the researcher expressing interest were counted and added up; (2) number of interested respondents who were determined ineligible/declined to participate. This was derived from adding up the number of interested respondents who failed to reply after being sent participation information and necessary forms to complete, who explicitly declined to participate, who did not pass the screening procedure; (3) number of final eligible sample who completed the study. This was derived from subtracting the number of dropped-out participant(s) from the initial number of eligible participants who enrolled in the study; (4) percent of compliant

participants in the sample retained for analysis. This was calculated by subtracting the percent of non-compliant participant(s) from the total percent retained for analysis; (5) average attendance rate for the group walks. The numbers in attendance for each group dog walk (total six walks) was added up and divided by six to obtain the average attendance rate for the group walks.

Worksheets content analysis

Participants' responses in the program worksheets were analyzed using content analysis. Content analysis is a flexible method for analyzing text data (Cavanagh, 1997) and is a research method that provides a systematic and objective means to make valid inferences from verbal, visual, or written data in order to describe and quantify specific phenomena (Downe-Wambolt, 1992). Responses containing often cited words and phrases were analysed for common meanings and the implications were interpreted based on the rationale and reasoning supported by the M-PAC framework. Responses that were unique, uncommon, or contradictory, were also reported to provide the reader with a balanced assessment of the worksheets responses. There was no formal thematic coding due to the design of the study (i.e., not a qualitative or mixed-methods study) and instead broad and open "codes" were applied to capture the overall intent of the responses.

Sample demographic and descriptive information

IBM SPSS 24 statistical software (IBM Corp., 2016) was used to obtain descriptive information of the sample of dog owners and dogs in the study. Dog owner demographic information included age ranges, sex, race/ethnicity, height and weight, marital status, employment status, education level, annual income, health status, and smoking status were analyzed. Dog demographic information included age in months, size, energy level, health status, weight, breed type(s), and training history were collected. Cross-tabulation and chi-square analyses were performed to determine any significant demographic differences between the experimental group and the waitlist-control group participants. Descriptive information pertaining to the post-study program evaluation survey was also obtained using this software.

Tests of analysis of covariance (ANCOVA) assumptions

IBM SPSS 24 statistical software (IBM Corp., 2016) was utilized to test whether data collected on secondary and tertiary outcomes met the statistical assumptions for analysis of covariance (ANCOVA) as follows (Grande, 2016): (1) normal distribution, (2) outliers, (3) homogeneity of regression slopes, and (4) homogeneity of variance. The Shapiro Wilk test was used to test data for normality (normal distribution), and the level of skewness for each outcome variable was used to determine the acceptable level of skewness, with acceptable values between -2 and 2 (George & Mallery, 2010). Outcome variables that violated the assumption of normality by testing statistically significant ($p <$

0.05) on the Shapiro Wilk test and/or presented levels of skewness beyond -2 or above 2 were statistically transformed either using exponential transformation for negatively skewed data or log transformation for positively skewed data (IBM Support, n.d.). Using the graph function in the IBM SPSS 24 statistical software, scatter plots were used to identify outliers. In the general linear model (GLM), the custom model option was used to test for homogeneity of regression slopes, and results from the Levene's Test in the full-factorial model of the GLM was used to test for homogeneity of variance. The full-factorial model ANCOVA was performed on variables that violated the homogeneity of regression slopes as it was necessary to include baseline variables as the covariate to control for baseline scores in order to examine whether the intervention program administered resulted in any changes.

Analysis of covariance (ANCOVA)

Analysis of covariance (ANCOVA) is a combination of regression and analysis of variance (ANOVA), and the technique is used to adjust the dependent (outcome) variable for some distractor variable (called the covariate) which is some variable that could affect the treatment (Thomas, Nelson, & Silverman, 2011). IBM SPSS 24 statistical software (IBM Corp., 2016) was utilized to perform ANCOVA, and baseline data for secondary and tertiary outcomes were used as covariates. Effect sizes, *p*-values, and 95% confidence intervals were reported in the results.

Effect size is an estimate of the strength or the meaningfulness of the group differences or treatments, and it is used to estimate the degree to which the treatment influenced the outcome (Thomas et al., 2011). Effect sizes were reported using partial eta-squared values, and partial eta squared values were classified as small (.01), medium (.06), large (.14) effect sizes (Cohen, 1977). Statistical significance was set at *p*-value equal to or less than .05. However, *p*-values equal to or less than .10 are also denoted as statistically significant when reported in the Results chapter and tabular presentations.

According to Thomas and colleagues (2011):

> Confidence intervals are used in hypothesis testing and a confidence interval provides an expected upper and lower limit for a statistic at a specified probability level, usually 95% or 99%. The size, or length of a confidence interval is affected by the size of the sample, the homogeneity of values within the sample, and the level of confidence selected by the researcher. Confidence intervals are based on the fact that any statistic possesses sampling error. This error relates to how well the statistic represents the target population. When we compute a mean for a sample, we are making an estimate of the mean of the target population. A confidence interval provides a band within which the estimate of the population mean is likely to fall instead of a single point. (p. 106)

Chapter 3 – Results

3:1 – Participants

Dog owner demographic

Of the 16 dog owners retained in the sample, 100% were Caucasian, 75% were female, 50% were between 45-54 years of age (mean age and *SD* information are not available due to closed question with only age ranges provided as response options), 62.5% were married, 62.2% completed 4-year college and above, 50% were full-time employed, 25% were retired, 56.3% earned annual incomes above $100,000. The majority of participants reported their health status as "good" (43.8%) to "very good" (37.5%), 93.7% were non-smokers, and the mean BMI was 26.5 (*SD* = 4.3). Chi-square tests showed no significant demographic differences between participants in the experiment and waitlist-control groups except for marital status (chi square = 9.60, asymptotic p = .02).

Dog demographic

Of the 16 dogs in the study, the mean age of dogs was 42.7 (*SD* = 43.9) months, 43.8% were female, 100% were healthy, 87.5% were of normal weight, 43.8% were small dogs, 25% were medium dogs, and 31.3% were large dogs. The majority of the

dogs had energy levels ranging from medium (31.3%), medium-to-high (37.5%), to high (18.8%).

Both dog owner and dog sample demographic information can be found in Tables 1 and 2. Collective demographic information of all 16 participants is presented in Table 1, and demographic information of participants categorized under experimental and waitlist-control groups is presented in Table 2. To maintain confidentiality, all actual names of participating dogs mentioned in the worksheets and program evaluation responses, and in any additional feedback and comments have been replaced by "*dog*".

3:2 – Primary Outcomes

Recruitment rate

During the recruitment stage, 74 respondents contacted the researcher expressing interest to participate and requested for more information. However, 57 of them were ineligible to participate leaving a total of 17 who met the eligibility criteria, resulting in a 23% recruitment rate. Please see Figure 2: CONSORT Flow Diagram of Enrolment, Allocation, Follow-Up, & Analysis.

The following respondents were screened and deemed ineligible to participate: (1) respondents who already met the minimum MVPA guidelines with or without their dogs (n = 14); (2) respondents who answered "yes" to any of the PAR-Q Plus Form questions

and who did not obtain medical clearance to participate (*n* = 2); (3) respondents whose dogs did not meet the dog eligibility criteria laid out for the study or had dog-related reasons that prevented them from participating (*n* = 5); (4) respondents who were unable to commit to the study timeline and/or location/schedule of the program (*n* = 7); (5) respondents who were unwilling to be randomized (*n* = 2); (6) respondents who declined to participate due to health-related reasons (*n* = 4); and (7) respondents who initiated contact expressing interest to participate and asked for more information about the study but failed to respond after the researcher reciprocated with detailed study information (*n* = 23). Of the 17 who were eligible and who enrolled into the study, four were recruited in-person, three from Facebook, three from newspapers, three from radio, two from physical posters placed in cafes, and two from Craigslist.

Retention rate

One participant in the experimental group dropped out at the start of week 2 of the program due to an overload of personal life issues that interfered with her ability to continue participation, and 16 participants were retained resulting in a 94% retention rate.

Adherence rate

Overall adherence rate was 94%. One participant (6%) in the experimental group did not submit week 6 and week 9 pedometry data due to damaged and lost pedometers. The participant had dropped as well as misplaced the devices, including prior

replacement and back-up units that were provided. The participant's work and extended travelling schedule rendered it impossible for the participant to receive additional replacement devices on time for the specified monitoring phases, and delayed submission of pedometry data would have compromised the fidelity of the program and the study timeline. This same participant also did not submit the *opportunity/habit* worksheet and the *enjoyment* worksheet. Hence, only self-report data was used for analysis for this participant, and this participant was deemed as "partial non-compliant".

Attendance rate

Participant attendance rate for the group walks had a mean = 4.7 (*SD* = 1.4, range = 3 – 6). An overview of individual participant attendance and per group dog walk attendance can be found in Table 9.

Program evaluation responses

Participants provided the following responses to program evaluation questions asking them to rate their overall satisfaction with the *use of pedometer device* (25% very satisfied, 25% satisfied), *worksheets and supplementary materials* (62.5% satisfied, 12.5% neutral), *number of group walks - six walks* (25% very satisfied, 62.5% satisfied), *length of group walk session* (62.5% very satisfied, 37.5% satisfied), *location and routes of group walks* (50% very satisfied, 50% satisfied), *time and day of group walks* (37.5% very satisfied, 37.5% satisfied), *methods of communication/information dissemination*

(62.5% very satisfied, 37.5% satisfied), *facilitator/instructor* (62.5% very satisfied, 37.5% satisfied), *troubleshooting and resolutions - where applicable* (12.5% very satisfied, 62.5% satisfied), and *pick-up/drop-off of pedometers and materials* (25% very satisfied, 62.5% satisfied).

Participants provided their responses to program evaluation questions asking them to rate whether they (strongly) agreed or (strongly) disagreed with the following program components and their effectiveness: *group walks were useful and helped participant to meet study objectives* (12.5% strongly agree, 37.5% agree), *enjoyment of attending the group walks* (50% strongly agree, 37.5% agree), w*ould recommend the group walks to other dog owners* (50% Strongly agree, 25% agree), *pedometer device was easy to use* (37.5% strongly agree, 37.5% agree), *pedometer device was useful and wearing it helped participant to meet study objectives* (12.5% strongly agree, 62.5% agree), *would recommend use of pedometer devices to other dog owners* (12.5% strongly agree, 62.5% agree), *log sheets and tracking step counts were useful and helped participant to meet study objectives* (12.5% strongly agree, 50% agree), *would recommend use of log sheets and tracking step counts to other dog owners* (12.5% strongly agree, 50% agree), *program increased motivation to make positive changes in PA & dog walking behavior* (37.5% strongly agree, 37.5% agree), and *program resulted in positive changes in PA & dog walking behavior* (37.5% strongly agree, 25% agree).

Participants provided their responses to program evaluation questions asking them to rate whether they (strongly) agreed or (strongly) disagreed with the following

statements regarding the worksheets' content and their effectiveness: *the planning worksheet was useful and provided new information/strategies* (12.5% strongly agree, 12.5% agree), *I utilized the planning worksheet regularly to make dog walking plans* (25% agree, 12.5% neutral), *I would recommend the planning worksheet to other dog owners* (25% agree, 37.5% neutral), *the exercise identity worksheet was useful and provided new information/strategies* (12.5% strongly agree, 12.5% agree), *I utilized the exercise identity worksheet regularly for reaffirmation of exercise identity* (25% agree, 25% neutral), *I would recommend the exercise identity worksheet to other dog owners* (25% agree, 37.5% neutral), *the opportunity/habit worksheet was useful and provided new information and strategies* (37.5% agree, 50% neutral), *I utilized the opportunity/habit worksheet regularly when making dog walking plans* (37.5% agree, 25% neutral), *I would recommend the opportunity/habit worksheet to other dog owners* (37.5% agree, 37.5% neutral), *the enjoyment worksheet was useful and provided new information and strategies* (12.5% strongly agree, 37.5% agree), *I utilized the enjoyment worksheet regularly when making dog walking plans* (37.5% agree, 25% neutral), *I would recommend the enjoyment worksheet to other dog owners* (37.5% agree, 37.5% neutral).

Participants provided their responses to program evaluation questions asking them to rate whether they (strongly) agreed or (strongly) disagreed with the following statements regarding program effectiveness: *I am now walking more with my dog per week* (12.5% strongly agree, 50% agree), *I am now more physically active with my dog per week* (12.5% strongly agree, 25% agree), *I am now more physically active overall per week* (12.5% strongly agree, 37.5% agree), *I am now more aware of the different intensity*

levels involved in the physical activities I engage in (25% strongly agree, 50% agree), and *I now would like more weekly scheduled group dog walks led by an instructor* (25% strongly agree, 37.5% agree).

3:3 – Secondary Outcomes

Test of assumptions for ANCOVA

Secondary outcomes categorized as behavioral outcomes were measured as follows: (1) *total weekly step counts*, (2) *average daily step counts*, (3) *MVPA dog walking*, (4) *MVPA with dog*, and (5) *MVPA without dog*. Data collected for self-report *MVPA dog walking* (baseline), *MVPA with dog* (baseline, week 6, and week 9), and *MVPA without dog* (baseline and week 9) violated the normality assumption but presented with acceptable levels of positive skew (skewness under 2), and thus were not transformed prior to further assumptions analyses and ANCOVA. Due to the small sample size, data that violated the assumptions of linearity and homogeneity of regression slopes were included in ANCOVA (The Analysis Factor, 2017). All data for secondary outcomes met the assumption of homogeneity of variance (i.e., non-significant results from Levene's Test). Please refer to Table 4 for a tabular presentation of secondary/behavioral outcomes. The results presented below reflect changes from baseline across time in the experimental group in comparison to the waitlist-list control group, and the *F* values reported below reflect the difference between the two groups while controlling for baseline as covariate.

Total weekly step counts (between-subjects) – At baseline, *total weekly step counts* for the experimental group had a mean = 69,202 (*SD* = 21,631). At week 6, *total weekly step counts* for the experimental group had a mean = 76,000 (*SD* = 18,377). When compared to the waitlist-control group, this resulted in a large effect size (partial eta squared = .41) that was statistically significant (p = .01; F = 8.20) at week 6. Pairwise comparisons at week 6 showed a mean difference = 16,643 (p = .01; *SE* = 5,813) and 95% CI = 3,976 – 29,311.

At week 9, *total weekly step counts* for the experimental group had a mean = 76,133 (*SD* = 13,841). When compared to the waitlist-control group, this resulted in a large effect size (partial eta-squared = .54) that was statistically significant (p = .00; F = 13.94) at week 9. Pairwise comparisons at week 9 showed a mean difference = 22,463 (p = .00; *SE* = 6,017) and 95% CI = 9,353 – 35,572. Compared to baseline, *total weekly step counts* for the experimental group had increased by an average of 6,798 steps per week at the end of the program, and increased by an average of 6,931 steps per week at follow-up.

Average daily step counts (between-subjects) **–** At baseline, *average daily step counts* for the experimental group had a mean = 9,886 (*SD* = 3,090). At week 6, *average daily step counts* for the experimental group had a mean = 10,857 (*SD* = 2,625). When compared to the waitlist-control group, this resulted in a large effect size (partial eta squared = .42) that was statistically significant (p = .01; F = 8.60) at week 6. Pairwise

comparisons at week 6 showed a mean difference = 2,465 (p = .01; SE = 841) and 95% CI = 634 – 4,297.

At week 9, *average daily step counts* for the experimental group had a mean = 11,068 (SD = 1,704). When compared to the waitlist-control group, this resulted in a large effect size (partial eta-squared = .63) that was statistically significant (p = .00; F = 20.05) at week 9. Pairwise comparisons at week 9 showed a mean difference = 3,464 (p = .00; SE = 774) and 95% CI = 1,779 – 5,150. Compared to baseline, *average daily step counts* for the experimental group had increased by an average of 971 steps per day at the end of the program, and increased by an average of 1,182 steps per day at follow-up.

MVPA dog walking (minutes per week) (between-subjects) **–** At baseline, *MVPA dog walking* for the experimental group had a mean = 91.25 (SD = 97.71). At week 6, *MVPA dog walking* for the experimental group had a mean = 145.00 (SD = 96.95). When compared to the waitlist-control group, this resulted in a large effect size (partial eta squared = .30) that was statistically significant (p = .04; F = 5.44) at week 6. Pairwise comparisons at week 6 showed a mean difference = 83.04 (p = .04; SE = 35.62) and 95% CI = 6.10 – 159.99.

At week 9, *MVPA dog walking* for the experimental group had a mean = 160.63 (SD = 99.51). When compared to the waitlist-control group, this resulted in a large effect size (partial eta squared = .23) that was statistically significant (p = .07; F = 3.91) at week 9. Pairwise comparisons at week 9 showed a mean difference = 97.06 (p = .07; SE =

49.07) and 95% CI = -8.94 – 203.06. Compared to baseline, *MVPA dog walking* for the experimental group had increased by an average of 53.75 minutes per week at the end of the program, and increased by an average of 69.38 minutes per week at follow-up.

MVPA with dog (minutes per week) (between-subjects) – At baseline, *MVPA with dog* for the experimental group had a mean = 39.38 (*SD* = 73.89). At week 6, *MVPA with dog* for the experimental group had a mean = 128.13 (*SD* = 100.14). When compared to the waitlist-control group, this resulted in a large effect size (partial eta squared = .36) that was statistically significant (p = .02; F = 7.21) at week 6. Pairwise comparisons at week 6 showed a mean difference = 121.33 (p = .02; *SE* = 45.19) and 95% CI = 23.70 – 218.95.

At week 9, *MVPA with dog* for the experimental group had a mean = 140.00 (*SD* = 115.85). When compared to the waitlist-control group, this resulted in a large effect size (partial eta squared = .25) that was statistically significant (p = .06; F = 4.39) at week 9. Pairwise comparisons at week 9 showed a mean difference = 110.77 (p = .06; *SE* = 52.84) and 95% CI = -3.39 – 224.93. Compared to baseline, *MVPA with dog* for the experimental group had increased by an average of 88.75 minutes per week at the end of the program, and increased by an average of 100.62 minutes per week at follow-up.

MVPA without dog (minutes per week) (between-subjects) – At baseline, *MVPA without dog* for the experimental group had a mean = 64.38 (*SD* = 80.42). At week 6, *MVPA without dog* for the experimental group had a mean = 106.25 (*SD* = 92.69). When

compared to the waitlist-control group, this resulted in no effect (partial eta squared = .00) and was not statistically significant (p = .86; F = .03) at week 6. Pairwise comparisons at week 6 showed a mean difference = -6.52 (p = .86; SE = 37.13) and 95% CI = -86.74 – 73.71.

At week 9, *MVPA without dog* for the experimental group had a mean = 146.25 (SD = 100.10). When compared to the waitlist-control group, this resulted in a medium-large effect size (partial eta squared = .13) that was not statistically significant (p = .19; F = 1.96) at week 9. Pairwise comparisons at week 9 showed a mean difference = 55.39 (p = .19; SE = 39.54) and 95% CI = -30.03 – 140.82. Compared to baseline, *MVPA without dog* for the experimental group had increased by an average of 41.87 minutes per week at the end of the program, and increased by an average of 81.87 minutes per week at follow-up.

Total MVPA (*MVPA with dog* + *MVPA without dog*) (minutes per week) for the experimental group had a mean = 286.25 minutes per week at week 9 follow-up.

3:4 – Tertiary Outcomes

Test of assumptions for ANCOVA

Data collected for the following tertiary outcomes – *capability*, *opportunity*, *dog responsibility,* and *dog outcome expectations* (*dog OE*) – violated the normality

assumption and were exponentially transformed prior to further assumption analyses and ANCOVA. Data for *intention* were log transformed prior to further assumption analyses and ANCOVA. Original data collected for *planning, identity, habit, human outcome expectations* (*human OE*), and *affective judgments* did not violate the normality assumption, and thus did not warrant transformations prior to further assumption testing and ANCOVA.

Due to the small sample size, tertiary outcomes (non-transformed and transformed data) that violated the assumptions of linearity and homogeneity of regression slopes were included in ANCOVA (The Analysis Factor, 2017). Data for all tertiary outcomes (non-transformed and transformed data) satisfied the assumption of homogeneity of variance (i.e., non-significant results from Levene's Test). A tabular presentation of ANCOVA for all tertiary outcomes can be found in Table 5. The results presented below reflect changes from baseline across time in the experimental group in comparison to the waitlist-list control group, and the *F* values reported below reflect the difference between the two groups while controlling for baseline as covariate.

Intention (log transformed) (between-subjects) – At baseline, *intention* for the experimental group had a mean = .92 (*SD* = .23). At week 6, *intention* for the experimental group had a mean = .87 (*SD* = .26). When compared to the waitlist-control group, this resulted in a small effect size (partial eta-squared = .03) that was not statistically significant (p = .58; F = .32) at week 6. Pairwise comparisons at week 6 showed a mean difference = -.04 (p = .58; *SE* = .08) and 95% CI = -.21 – .12.

At week 9, *intention* for the experimental group had a mean = .89 (*SD* = .27). When compared to the waitlist-control group, this resulted in no effect (partial eta-squared = .00) and was not statistically significant (*p* = .87; *F* = .03) at week 9. Pairwise comparisons at week 9 showed a mean difference = -.02 (*p* = .87; *SE* = .09) and 95% CI = -.21 – .18.

Reflective/motivational processes

Capability (exponentially transformed) (between-subjects) – At baseline, *capability* for the experimental group had a mean = 124.96 (*SD* = 43.43). At week 6, *capability* for the experimental group had a mean = 106.75 (*SD* = 59.69). When compared to the waitlist-control group, this resulted in a small-medium effect size (partial eta-squared = .05) that was not statistically significant (*p* = .45; *F* = .62) at week 6. Pairwise comparisons at week 6 showed a mean difference = -16.98 (*p* = .45; *SE* = 21.54) and 95% CI = -63.51 – 29.54.

At week 9, *capability* for the experimental group had a mean = 106.75 (*SD* = 59.69). When compared to the waitlist-control group, this resulted in no effect (partial eta-squared = .00) and was not statistically significant (*p* = .95; *F* = .00) at week 9. Pairwise comparisons at week 9 showed a mean difference = 1.86 (*p* = .95; *SE* = 27.75) and 95% CI = -58.09 – 61.80.

Human outcome expectations (human OE) (between-subjects) – At baseline, *human OE* for the experimental group had a mean = 4.04 (*SD* = .70). At week 6, *human OE* for the experimental group had a mean = 4.17 (*SD* = .82). When compared to the waitlist-control group, this resulted in a large effect size (partial eta-squared = .16) that was not statistically significant (*p* = .13; *F* = 2.55) at week 6. Pairwise comparisons at week 6 showed a mean difference = .60 (*p* = .13; *SE* = .38) and 95% CI = -.21 – 1.41.

At week 9, *human OE* for the experimental group had a mean = 4.08 (*SD* = .64). When compared to the waitlist-control group, this resulted in a small effect size (partial eta-squared = .01) that was not statistically significant (*p* = .69; *F* = .16) at week 9. Pairwise comparisons at week 9 showed a mean difference = .10 (*p* = .69; *SE* = .25) and 95% CI = -.44 – .65.

Dog outcome expectations (dog OE) (exponentially transformed) (between-subjects) – At baseline, *dog OE* for the experimental group had a mean = 105.41 (*SD* = 40.65). At week 6, *dog OE* for the experimental group had a mean = 115.93 (*SD* = 45.32). When compared to the waitlist-control group, this resulted in a small effect size (partial eta-squared = .01) that was not statistically significant (*p* = .71; *F* = .14) at week 6. Pairwise comparisons at week 6 showed a mean difference = 7.67 (*p* = .71; *SE* = 20.28) and 95% CI = -36.14 – 51.47.

At week 9, *dog OE* for the experimental group had a mean = 108.11 (*SD* = 37.38). When compared to the waitlist-control group, this resulted in no effect (partial eta-

squared = .00) and was not statistically significant (p = .82; F = .06) at week 9. Pairwise comparisons at week 9 showed a mean difference = -4.42 (p = .82; *SE* = 18.51) and 95% CI = -44.39 – 35.56.

Opportunity (exponentially transformed) (between-subjects) – At baseline, *opportunity* for the experimental group had a mean = 113.23 (*SD* = 48.55). At week 6, *opportunity* for the experimental group had a mean = 106.75 (*SD* = 59.69). When compared to the waitlist-control group, this resulted in no effect (partial eta-squared = .00) and was not statistically significant (p = .90; F = .02) at week 6. Pairwise comparisons at week 6 showed a mean difference = 4.10 (p = .90; *SE* = 31.05) and 95% CI = -69.99 – 71.19.

At week 9, *opportunity* for the experimental group had a mean = 106.75 (*SD* = 59.69). When compared to the waitlist-control group, this resulted in a medium effect size (partial eta-squared = .11) that was not statistically significant (p = .22; F = 1.63) at week 9. Pairwise comparisons at week 9 showed a mean difference = 35.13 (p = .22; *SE* = 27.54) and 95% CI = -24.37 – 94.64.

Affective judgments (between-subjects) – At baseline, *affective judgments* for the experimental group had a mean = 4.19 (*SD* = .79). At week 6, *affective judgments* for the experimental group had a mean = 4.41 (*SD* = .44). When compared to the waitlist-control group, this resulted in a large effect size (partial eta squared = .26) that was statistically significant (p = .05; F = 4.59) at week 6. Pairwise comparisons at week 6 showed a mean

difference = .42 (p = .05; SE = .20) and 95% CI = -.00 – .85. No data available for *affective judgments* at week 9.

Regulatory processes

Planning (between-subjects) – At baseline, *planning* for the experimental group had a mean = 2.94 (SD = 1.10). At week 6, *planning* for the experimental group had a mean = 3.46 (SD = .74). When compared to the waitlist-control group, this resulted in a large effect size (partial eta-squared = .22) that was statistically significant (p = .08; F = 3.67) at week 6. Pairwise comparisons at week 6 showed a mean difference = .73 (p = .08; SE = .38) and 95% CI = -.09 – 1.56.

At week 9, *planning* for the experimental group had a mean = 3.31 (SD = .76). When compared to the waitlist-control group, this resulted in a large effect size (partial eta-squared = .19) that was statistically significant (p = .10; F = 3.13) at week 9. Pairwise comparisons at week 9 showed a mean difference = .67 (p = .10; SE = .38) and 95% CI = -.15 – 1.50.

Reflexive processes

Identity (between-subjects) – At baseline, *identity* for the experimental group had a mean = 3.54 (SD = .59). At week 6, *identity* for the experimental group had a mean = 3.89 (SD = .35). When compared to the waitlist-control group, this resulted in a large

effect size (partial eta-squared = .27) that was statistically significant (p = .05; F = 4.69) at week 6. Pairwise comparisons at week 6 showed a mean difference = .50 (p = .05; *SE* = .23) and 95% CI = .00 – 1.00.

At week 9, *identity* for the experimental group had a mean = 3.64 (*SD* = .71). When compared to the waitlist-control group, this resulted in a large effect size (partial eta-squared = .29) that was statistically significant (p = .04; F = 5.24) at week 9. Pairwise comparisons at week 9 showed a mean difference = .58 (p = .04; *SE* = .25) and 95% CI = .03 – 1.12.

Habit (between-subjects) – At baseline, *habit* for the experimental group had a mean = 2.59 (*SD* = .79). At week 6, *habit* for the experimental group had a mean = 2.88 (*SD* = 1.04). When compared to the waitlist-control group, this resulted in no effect (partial eta squared = .00) and was not statistically significant (p = .95; F = .01) at week 6. Pairwise comparisons at week 6 showed a mean difference = .02 (p = .95; *SE* = .32) and 95% CI = -.67 – .72.

At week 9, *habit* for the experimental group had a mean = 3.34 (*SD* = .79). When compared to the waitlist-control group, this resulted in a large effect size (partial eta squared = .23) that was statistically significant (p = .07; F = 3.94) at week 9. Pairwise comparisons at week 9 showed a mean difference = .63 (p = .07; *SE* = .32) and 95% CI = -.06 – 1.32.

Dog responsibility (exponentially transformed) (between-subjects) – At baseline, *dog responsibility* for the experimental group had a mean = 95.08 (*SD* = 54.18). At week 6, *dog responsibility* for the experimental group had a mean = 76.97 (*SD* = 49.60). When compared to the waitlist-control group, this resulted in no effect (partial eta-squared = .00) and was not statistically significant (*p* = .97; *F* = .00) at week 6. Pairwise comparisons at week 6 showed a mean difference = -.86 (*p* = .97; *SE* = 24.77) and 95% CI = -54.37 – 52.66.

At week 9, *dog responsibility* for the experimental group had a mean = 92.07 (*SD* = 44.48). When compared to the waitlist-control group, this resulted in a small effect size (partial eta-squared = .03) that was not statistically significant (*p* = .56; *F* = .35) at week 9. Pairwise comparisons at week 9 showed a mean difference = 9.89 (*p* = .56; *SE* = 16.67) and 95% CI = -26.12 – 45.90.

3:5 – Worksheet Responses

Program worksheets asked for participants' open-ended responses and these responses provided some qualitative insight into each participant's reflective/motivational, regulatory, and reflexive processes. The dosage of program worksheets as part of the program can only be assumed to have been effective based on participants' completion and submission of the worksheets, and when compared with the outcomes of the study. Please see Table 6 for a comprehensive tabular presentation of worksheet responses from each participant.

From participants' responses in the *planning* worksheet (Table 6), a pattern that emerged and was evident addressed the plan/desire/intention to achieve dog walks that were more frequent, more intense/strenuous, more focused, and longer in duration. Practicing recall with the dog, walking on trails in more forested areas, and socialization and playtime for their dogs were also included as objectives when it came to making dog walking plans. Majority of the participants (6 out of 8) planned to set aside at least 30 minutes to walk their dogs each session, and evening times to walk the dog were most frequently cited.

Some of the possible problems that could have gotten in the way of participants carrying out their physical activity plans included "inclement/unfavorable weather", "work events/sudden work", "family responsibilities", "social events", "procrastinating", "feeling too tired", "physical pain", "sleeping in", and "there are no dogs for (participant's dog) to play with". The ideas for coping plans which participants came up with to resolve potential problems they expected to encounter included "walk before work/while on the phone/to do errands", "get into a routine", "don't take on too much (like trying to clean the whole house in one day", "set the alarm to go to sleep earlier", and "come to the field another day of the week". Participants prepared to carry out their physical activity plans in poor weather by wearing "rubber booties" and "weather resistant cap", having "dry towels" and "doggy towels in the car", "doggy jacket" for their dogs, and "raincoat/windbreaker/all manner of rain gear" for themselves.

From participants' responses in the *identity* worksheet (Table 6), the top-ranked and most prevalent identities were family/people-related, such as being a spouse ("wife"/"husband"), being parents/children/siblings ("mother", "mother-in-law", "father", "son", "daughter", "sister"), being a friend ("caring friend", "being supportive of family/friends"). The identity of being dog parents/owners/walkers ("mom to two dogs", "dedicated dog parent", "dog walker", "dog/pet owner") were also prevalent but only two out of eight participants placed being "mom to (their) dogs" as their highest-ranked identity. Other identities which participants listed were tied to their hobbies/favorite activities ("bookworm", "cook", "Facebooker", "kayaker", "Netflix junkie", "home handyman", "Yogi"), and occupation ("hardworking working professional", "breadwinner", "nurse", "realtor").

Some of the ways which participants planned to celebrate their (new) dog walking exercise identity included taking and posting photos of their dog to social media ("*dog's* Instagram account", "Facebook"), "sharing stories and experiences with friends", and shopping for their dogs and themselves ("*dog* will get a new collar", "comfortable walking shoes", "get fun bandanas for dog to wear on walks").

It was noted that the only one participant who did not rank or identify as a "dog owner/parent" or "dog walker" in their list of identities was the same participant who attended only one out of six group walks, and was also the same participant who did not complete two out of four worksheets, and who did not submit week 6 and week 9 pedometry data.

From participants' responses in the *opportunity/habit* worksheet, majority of the participants identified two daily cues that presented as opportunities to walk their dogs. Mornings "after breakfast" and evenings "after dinner" were the most popular cues that associated with specific events of the day to remind participants to walk their dogs. Other daily cues (and their associated reminder strategies) include "late afternoon (force myself to stop work using a computer alarm)", "when the dog fusses or barks (when there is no obvious cause)", "changing into street clothing from my work clothing (the dogs follow me around until I take them out)", and "I will verbally promise them a walk (even though they are dogs, when I make a promise, I like to try and keep it)".

In the *enjoyment* worksheet, participants provided a variety of enjoyable and motivational reasons to dog walk. Some of the most common reasons were associated with enjoying nature ("fresh air", "enjoy flowers and birds", "connect with nature", "explore new places", "touch trees"), connecting with the neighborhood ("visit/connect with neighbors", "getting out into our neighborhood"), improving health/well-being ("feel healthier", "healthy for both myself and my dogs", "I feel better physically after walking her", "improve mood", "reduce stress", "feel our best", "live in the moment"), and bonding with dog ("bond with ***dog***", "I like to see how happy it makes her", "***dog*** makes me laugh").

Many of the enjoyable locations which participants liked to walk with their dogs included local nature parks/trails/beaches ("Galloping Goose Trail", "Mount Doug", "Elk Lake/Beaver Lake", "Butchart Gardens", West Bay Walkway), their own/different

neighborhoods (“own street”, “neighborhood”, “Gorge Park”, “new and different neighborhoods”), and areas that are “off-leash” for dogs. Enjoyable social experiences for participants and their dogs included “running errands (with dog)”, socialization with neighbors (“better contact with neighbors”, “in touch with the street”), meeting people and dogs (“running into people and dogs we know”, “pleasant to meet friends/strangers with dogs”, “interesting to meet new dogs”, “opportunity to play with other dogs”, “important for dogs to be socialized”), and visiting/attending “dog friendly stores/events/parades” (“Oak Bay Tea Party”, “Victoria Day”, “Pride Parade”, “fundraising/charity walks”).

Other enjoyable reasons to dog walk (not categorized above) included participation in the study that led one participant to becoming “accountable/consistent” (“I keep an activity log and wear my pedometer”) and being “more aware of/focused on (her dog walking) posture and stride”, dog walking with loved ones/group (“get hubby to accompany us more”, “take the dog and a friend for a walk”, “walking with loved ones and friend”, “join a group walk that goes on forest hikes, as I don’t feel comfortable going alone”), and “dogs make the world a better place for their human companions”.

Chapter 4 – Discussion

To the researcher's knowledge, this study was the first open parallel feasibility randomized controlled trial in dog walking research that was based on the M-PAC framework. This was also the first dog walking intervention to deliver a program consisting of weekly scheduled instructor-led group dog walks supplemented with M-PAC construct strategies to encourage increased dog walking among dog owners. Below, the findings are discussed in the light of the literature, first in terms of the study's feasibility and acceptability, and feedback of the program. Next, the intervention's effects on dog walking and physical activity are presented, followed by the utility of the M-PAC framework as a guiding strategy for dog walking intervention. Finally, the study's strengths, limitations, and recommendations for future research are offered before the chapter concludes.

4:1 – Feasibility and Acceptability

Primary hypothesis

It was hypothesized that a 9-week randomized controlled trial involving a program of weekly scheduled instructor-led group dog walks supplemented with M-PAC construct intervention strategies would be feasible and acceptable to encourage increased dog walking and physical activity among dog owners in Greater Victoria, BC. This hypothesis was largely supported with evidence from the feasibility outcomes of 23%

recruitment rate, 94% retention rate, 94% adherence rate, group walk mean attendance rate of 4.7 (*SD* 1.4), and overall positive (i.e., satisfied/very satisfied) program evaluation feedback from program participants.

These primary outcomes are on par with, if not somewhat more promising, compared to other feasibility and pilot studies promoting physical activity through walking. The Everyday Activity Supports You ("EASY") randomized controlled trial pilot study conducted by Ashe and colleagues (2015) received 82 interested responses with 68% (56/82) meeting the inclusion criteria, resulting in a recruitment rate of 45% (25/56), and a final retention rate of 80% (20/25) at six months. In the minimal contact intervention to promote walking among less active women (Dinger, Heesch, & McClary, 2005), 43 women initially enrolled in the study, and the study had a 84% retention rate. When compared to a full powered randomized controlled trial, such as the web-based pedometer-based intervention promoting walking among adults, where 274 participants had initially enrolled and 72% (198/274) were retained at three month follow-up (Compernolle, Vandelanotte, Cardon, De Bourdeaudhuij, & De Cocker, 2015), it can be suggested that this present dog walking intervention may have the potential to yield comparable, if not better, percentage outcomes if it were to be conducted as a full trial.

Overall satisfaction feedback received from program participants in this present dog walking feasibility study pertaining to the number of group dog walks (87.5% satisfied/very satisfied), length of each group dog walk session (100% satisfied/very satisfied), location and routes of group dog walks (100% satisfied/very satisfied),

worksheets and materials (62.5%), and facilitator/instructor satisfaction (100% satisfied/very satisfied) were comparable to the program (76% excellent), handbook (75% excellent), and instructor satisfaction (100% excellent) ratings in the "CanChange" pilot study where the instruction and support of a health coach, and a handbook were used as part of its health and lifestyle intervention (Hawkes et al., 2009). Compared to these health and physical activity intervention studies (Ashe et al., 2015; Compernolle et al., 2015; Hawkes et al., 2009), even though this present study had a relatively low recruitment rate, all other feasibility outcomes of this study, taken in conjunction with the overall positive program evaluation responses/feedback received, support the feasibility and acceptability of the program administered in this study.

Upon the launch of this study, recruitment efforts undertaken by the researcher garnered well-received responses from the community with 74 persons contacting the researcher expressing their interest to participate, lending support that there is demand for such a program. Even though only 23% out of 74 respondents were recruited for the study, outcomes related to retention, adherence, attendance, and program evaluation largely supported the feasibility and acceptability of the program. While initial interest to participate was present, 31% of the 74 respondents did not follow-up with the necessary steps for participation, such as completing and returning the Screening Form and the PAR-Q Plus Form.

A variety of reasons can be gleaned from this lack of follow-up even though no specific reasons were provided. It was probable that a large majority of interested

respondents were anticipating immediate enrolment into a no-cost dog walking-with-dog-socialization program where dogs were able to interact closely and receive playtime with each other. While the researcher acknowledges the appeal of such a program to the community of dog owners given that professional-led dog walking programs as well as organized/supervised dog socialization programs are typically paid-for programs (offered by for-profit service providers) that require monetary investment, dog socialization was not part of the objectives of the study and was in fact prohibited according to ethical and risk management protocols. In addition, immediate participation in the group dog walks was not conditional nor guaranteed upon enrolment or expression of interest due to the study's randomized controlled trial design that mandated the random selection of eligible participants into either the experimental or waitlist-control group. The possibility that interested respondents could be randomized into the waitlist-control group, only to receive the group dog walks 2.5 months later (starting in the fall season), could have discouraged interest in participation.

Furthermore, given that summer season is generally associated with leisure, relaxation, and time off taxing commitments, the rather demanding participation workload (as described and explained in the Participation Consent Form and emails) together with the 10-week commitment to the study (including the baseline week) during the summer season may have also deterred further interest. Moreover, any vacation and leisure plans (pre-arranged and/or on-the-fly plans) would have interfered with participation in the study, thus committing to an academic study spanning 2.5 months long would have compromised one's availability for such plans.

Out of the 74 respondents, 19% already met the recommended minimum MVPA guidelines and were ineligible to participate in spite of their high level of interest to do so. Aligned with evidence from previous dog walking research, dog owners are comparatively more active than non-dog owners (Westgarth et al., 2014); thus, while the expression of interest from active dog-owners (who already met MVPA guidelines) were welcomed and appreciated, it was regrettable – for the study's purposes – that they were ineligible to participate given the target population of the study was inactive dog-owners or dog owners who were not already meeting MVPA guidelines. Future studies may consider modifying/raising the minimum MVPA guidelines criteria to accommodate more dog owners, or create dog walking intervention studies to include the already-active dog owners to augment their existing MVPA volume, and to compare the already-active group against the less active and/or sedentary dog owners, and use this information to fine-tune future dog walking interventions.

It was noted during the recruitment drive that several respondents declined to participate due to lack of scheduling/timing options (9%) and dog-related issues (7%). To combat and reduce these barriers to participation, it is recommended that future studies provide participants with schedule/venue/seasonal options for the group dog walks and include online program options that would cater to individual availability/location, and address dog-related issues (i.e., breed traits, spay/neuter status, socialization-aggression levels) that could pose risks or be exacerbated in certain weather conditions/temperatures, or in group/unfamiliar situations. Some program suggestions for future considerations could involve fully online programs, similar to what Richards and colleagues (Richards et

al., 2016; Richards et al., 2017) have delivered, or a combination of in-person and online programs such as the study conducted by Schneider and colleagues (2015). The need for options and to offer flexibility for participants and their dogs to be more autonomous while participating in the study cannot be overstated especially for future studies looking to recruit a larger sample.

With 5% declining to participate due to health-related reasons (such as having arthritis, being wheelchair bound, and dealing with neural injuries), future studies could look into offering dog walking interventions for different demographics/sub-groups of dog owners (Bowen et al., 2009), such as special population dog owners which may include (1) dog owners with chronic pain or disabilities, (2) persons living with and relying on guide/therapy dogs, (3) persons with disabilities or barriers (e.g., health, socio-economic) who may not/cannot/will not be able to own dogs, and also (4) dog walking volunteers at dog shelters. In support of this proposition, a study by Johnson and Meadows (2010) found that loaner dog walking programs may effectively facilitate commitment and adherence to physical activity among populations with multiple chronic illnesses; as such, persons with disabilities who may not already own dogs, or whose disabilities prevent them from engaging in the long-term daily care and ownership of a dog, may benefit from participating in regular loaner-dog walking programs under qualified and/or medical supervision.

The obligation to maintain the rigorous standards of a randomized controlled trial mandated that alternatives could not be given to the 3% of respondents who were

unwilling to be randomized. Nonetheless, their interest in participation was appreciated and acknowledged, and potential participants' unwillingness to be randomized in trials is recognized as part of the research process (Sidani, Fox, & Epstein, 2017). Finally, due to the monetary costs needed to obtain medical/veterinarian clearance to participate in the study, 3% of respondents declined to participate. The researcher acknowledges that the costs for a doctor's note (approximately CAD $25) coupled with long wait times at walk-in clinics can pose as barriers to participation. Therefore, it is recommended to scale up future dog walking interventions to obtain funding that could cover these medical/veterinarian clearance costs for otherwise eligible participants, and allow sufficient time between respondents' expressions of interest and the start of the study for interested respondents to obtain medical/veterinarian clearance. To address and combat low recruitment rates of eligible dog owners in Greater Victoria, BC, for an otherwise appealing and well-demanded program among dog owners in the community, a multi-site approach involving other cities/regions is recommended. A multi-site approach makes it more likely that the study will be able to recruit and retain enough participants to provide valid answers to research questions (CareSearch, 2017).

Out of the 17 participants enrolled into the study, 16 were retained for analysis resulting in a 94% retention rate. The one program participant who dropped out at the start of week 2 related her inability to continue with the study due to the other stresses and demands she was concurrently experiencing in her personal life ("I'm sorry but I can no longer remain in the study. I have far too much going in my life these days and it's just too much. Thanks and sorry if this messes up your study. I just can't do it. Thanks for

understanding."). Nonetheless, for the one group dog walk that she attended, she provided verbal feedback during and after the walk that it was enjoyable, and that attending the walk helped to relieve some of the stress she was experiencing prior to the walk. Out of the 16 participants retained for analysis, one program participant did not complete two out of four assigned worksheets and also failed to submit pedometry data for week 6 and week 9 – the latter largely attributable to the participant's work/travelling schedule and the participant's delay in contacting the researcher to replace dropped-and-damaged/lost pedometers. Future studies should consider/combine the use of other reliable and valid types of activity tracking devices (e.g., Fitbit and accelerometers) in order to combat the loss of important data due to device-related issues that may occur when the participant(s) are out of town or otherwise too occupied to arrange for replacement devices on time.

Attendance absences were accounted for due to delayed starts, long-weekend holidays, summer vacation plans, vehicle breakdown, shift work/work priorities, dog illness, and family/personal commitments. Recognizing that the study took place in summer, reasons for majority of these attendance absences were inevitable and largely anticipated. Considering the above factors, the group walks were nevertheless reasonably well-attended with a mean = 4.7 (*SD* = 1.4; range = 3 – 6), and a minimum of three participants at every walk. Offering reasonable and low-cost incentives (National Institute of Justice, 2017) to encourage attendance, such as complementary healthy dog cookies/treats at the end of each walk may possibly enhance the participation experience for treat-motivated dogs and their respective owners. Seeing their dogs being rewarded

and valued (Rhodes, 2017) for participation at the end of the walks may motivate dog owners to attend the walks more regularly by evoking positive affective judgments and influencing outcome expectations (Rhodes, 2017) associated with enjoyment, motivation, and parental pride (Kushner et al., 2006). Taking all of these points into consideration, future studies should consider offering group dog walks during different seasons of the year where participants' schedules may have more regularity, and provide motivational dog-related incentives to encourage attendance at the walks.

Post-study group dog walks were offered to the waitlist-control group participants and experimental group participants were welcomed to attend if they wanted to. Of the three post-study group dog walks delivered, it was noted that only two waitlist-control group participants attended. Some of the reasons the other waitlist-control group participants were unable/uninterested to attend included change in individual availability (i.e., their fall schedules differed from their summer schedules) and change in seasonal conditions (i.e., shorter daylight hours, colder temperatures, wetter outdoor conditions). Based on these reasons, together with several last-minute cancellations by study participants (who had expressed interest to attend via Doodle poll and email) due to "studying for mid-term exams" and "having relatives/house guests staying over", etc., an executive decision was made by the researcher/facilitator to cease offering the post-study group dog walks after three sessions.

It may be of interest to note that four experimental group participants attended the post-study group dog walks, which was twice the number of attendees from the waitlist-

control group. It can be suggested that participation in the group dog walk program motivated experimental group participants to continue wanting to walk and socialize with the group and the instructor even after the study concluded. This observation aligns with what Schneider et al. (2015) found in their study, that participants in the Meetup condition continued (to utilize the social networking platform) to schedule in-person group dog walks in the neighborhood when the study was over. To further support these observations of enjoyment/social outcomes in this present study, program participants voluntarily and graciously extended an invitation to the instructor/study participants to host a post-study social event at their home after the study was completed ("You are welcome to invite the study participants to have an end-of-project gathering at our house, if you wish.").

Additionally, the one partial non-compliant participant in the experimental group, who had missed five out of six program group dog walks, attended all three post-study group dog walks. The participant had previously related his enjoyment of attending one of the program group dog walks and provided legitimate reasons for why the other five were missed (due to work/life/vacation demands on various weekends in the summer) (see Table 10). This participant's 100% attendance at the three post-study group dog walks likely resulted because the participant's schedule had stabilized in the fall and supports that the participant genuinely enjoyed the in-person experience of the walks. This further highlights the need to offer seasonal options for the program of group dog walks, extend program duration, and/or implement longitudinal study designs to accommodate dog owners with busy summer schedules.

Program evaluation

Closed-rated program feedback

Program participants were overall (very) satisfied with the number of group walks (87.5%), length of group walk sessions (100%), location and routes of group walks (100%), time and day of group walks (75%), methods of communication/information dissemination (100%), facilitator/instructor (100%), troubleshooting and resolutions - where applicable (75%), pick-up/drop-off of pedometers and materials (87.5%). Half of the participants rated the use of pedometer as (very) satisfied and 62.5% rated satisfied with the worksheets and supplementary materials. Majority of the program participants (strongly) agreed that they enjoyed attending the group walks (87.5%), and would recommend the group walks to other dog owners (75%). They also agreed that the pedometer device was easy to use (75%), that wearing the device (75%) and tracking step counts (62.5%) was useful towards helping them meet study objectives, and that they would recommend the use of pedometers (75%) and tracking log sheets (62.5%) to other dog owners. Most participants also agreed that the program increased their motivation (75%) and resulted in positive changes in their dog walking and physical activity behavior (62.5%). Half of the participants (strongly) agreed that the group walks were useful and helped them meet study objectives.

Participants' closed-rated responses regarding individual M-PAC construct worksheets were somewhat mixed, suggesting that while the majority did not perceive

the worksheets to have provided new information, they generally agreed that they utilized selected individual worksheets when making dog walking plans and/or to reaffirm their dog walking exercise identity. Majority rated agreed/neutral when asked if they would recommend specific individual worksheets to other dog owners (see Table 8). Majority of the participants (strongly) agreed that, as a result of their participation, they were walking more with their dog per week (62.5%), were more aware of the different intensity levels involved in the physical activities they engaged in (75%), and that they would like more weekly scheduled group dog walks led by an instructor (62.5%).

Half of the participants (strongly) agreed that, as a result of their participation, they were more physically active overall per week (50%). Less than half of the participants agreed that they were more physically active with their dog per week (37.5%), which could simply suggest that aside from the primary activity of walking with their dog, most participants did not increase their participation in other dog-inclusive physical activities. Walking with one's dog appears to be the most preferred and convenient activity when it comes to being active with one's dog due to its ease, convenience, and availability of locations to do so (Kushner et al., 2006); however, many other dog-inclusive/dog-friendly physical activities are available and these activities can provide variety/options to reduce monotony/boredom, offer new challenges and different levels of intensities, and increase overall motivation/enjoyment among dog owners to become more active with their dogs. Future studies could look into offering other forms of dog-inclusive/dog-friendly physical activities, such as cycling/bikejoring, swimming, skateboarding (this may be more appealing for the youth dog owner demographic),

running/cani-cross, dog-inclusive fitness bootcamps, Ultimate Frisbee, and/or agility sessions where both dog owner and dog can participate.

Open-ended program feedback

Participants were involved in the study for a variety of reasons including wanting to be more accountable and committed to their dog walking routine/activity, wanting to establish the habit of taking the dog out for more walks, being interested in the study, desiring benefits for themselves and their dog, and using the study as an opportunity to spend more time with their dog. Participants described their participation experience as "fun", "healthy", "interesting", "educational", "beneficial", "enjoyable", "motivational", "enriching", "social", "long", and "short". Their favorite aspects of the program include the group dog walks ("the group walks"; "the weekly group dog walks"), meeting new people and their dogs in the group dog walks ("provided social time"; "I enjoyed meeting some of the people and their dogs"), the diversity of the group dog walk sample ("I enjoyed the interaction with the other participants and the researcher. They are all interesting people."), the convenience/location/scenery of the group walks ("near home"; "it is a lovely park"), the organized aspects of the group dog walks ("the scheduled walks would provide an additional opportunity to be out with my dog"), keeping track of their step counts and journaling their level of physical activity, having a change of pace, and the dog walking activity itself ("just to get out walking"; "walking my dog").

When asked which aspects they would like kept in the study, majority of the participants would like the in-person group dog walks and pedometer tracking activity to remain, as well as the frequency, duration, and location/vicinity of the group dog walks. One participant would like the "no forced social activities" element to be kept. When asked which aspects they would like changed, majority of the participants suggested having a larger sample, providing more scheduling/seasonal options for the walks, extending the duration of the study, and providing incentives to boost attendance, such as "happy hour" for the humans and "milk bone hour" for the dogs. One participant stated that "all aspects of the program were fine and should remain the same". Gathering from these responses, the group setting and social aspects of the walks, the frequency and duration of the walks, the enjoyment and convenience of the group dog walk venue, as well as the education/support/organization of the walks provided by the instructor were positive/motivating factors that contributed to the overall enjoyable aspects of the walks. These findings aligned with what was found in the study by Kushner et al. (2006) where self-efficacy, group/social setting, and instructor feedback/praise during exercise were important factors when it came to encouraging dog owners to exercise with their dogs. These positive affective and effective elements associated with group dog walking should be retained for future studies.

Participants who self-identified as being already motivated, responsible, and habitual in their dog walking behavior – and as such, admitted to self-selecting to participate in the study – suggested that while the worksheets were good for further self-reflection, they would be more useful for other dog owners who lacked insight into their

own motivations and behavior. While these participants did not feel that the worksheets provided new information ("I read through all the worksheets but was not persuaded that a lot of paperwork would be helpful."; "They seemed to me to be a very insignificant part of the project."), and were more self-reflecting in essence ("Having the exercises was good for further self-reflection."), the self-reflection that ensued from completing the worksheets ultimately led to positive changes across time for the targeted M-PAC constructs. As well, exposure to the M-PAC construct worksheets prompted one program participant to reassess her dog walking motivation, resulting in the enhancement/strengthening of her dog-owner-and-dog relationship with her dog ("I came to enjoy my walks as a time to be with my dog rather than something that had to be done."), and a stronger dog-owner-and-dog bond/level of attachment has been found to correlate with more regular occurrences of dog walking (Westgarth et al., 2016). The tertiary outcomes support that the dosage of the worksheets and participants' exposure to them was efficacious even if the precise mechanism of how the worksheets dosage/exposure worked could not be measured in this study. Future studies may consider using online programs/mobile applications to administer and receive completed worksheets, and where participants' access to the worksheets and time spent in completing each worksheet (including each section within the worksheet) can be monitored and analyzed quantitatively.

One program participant provided additional feedback that her participation in the study motivated her coworkers to "jump on the bandwagon" and join her for lunch time walks which quickly led to a formal walking group being formed at her workplace.

Additionally, this same participant's family members in Calgary, AB, were also inspired by her participation in the study, and they consequently purchased Fitbits and started step challenges among themselves. This positive impact of study participation on the participant's interpersonal, familial, and work environments was remarkable to note, and may have in turn also augmented/reinforced the participant's motivation and enjoyment in making positive behavioral changes. This concurrent ripple-reciprocal effect accords with the socio-ecological tenet in dog walking research that acknowledges the interplay between the individual dog owner and their social and physical environments in which they work, live, and recreate (Westgarth et al., 2014).

Three participants related some frustration associated with pedometer issues, and the interruptions in step-count tracking and hassle encountered for these participants may have affected overall satisfaction with the device. Nonetheless, the device was overall rated as easy to use and rated as useful in helping participants meet study objectives. With the circumstantial exception pertaining to the partial non-compliant program participant in weeks 6 and 9, all other pedometers reported by participants to be malfunctioning were replaced promptly by the researcher during the program/study, and additional back-up devices, pedometer security straps, and spare batteries were also provided.

One participant commented that the "group walks could be a bit more organized and routes planned out a bit more clearer" even though this participant had attended only two out of six walks; contrarily, collective feedback from other program participants

support that the group dog walks routes were enjoyable and well-thought out ahead of time to provide variety/novelty ("I had not walked through some of the areas before"; "the organized walks were opportunities for walks that were different and of greater duration") and education/benefits ("nice change of pace") for the participants who regularly attended.

One participant mentioned that the study objectives were not clear to her ("confusing"; "I was and remain very unclear on what the purpose of the study was") even though the study objectives were explained in detail in the Participant Consent Form (Appendix E), Implied Consent Form (Appendix F), throughout the program, and with opportunities for clarification with the researcher/instructor readily available all the way through the study as needed. Consequentially, this participant's confusion may have also affected overall response ratings for various program evaluation questions related to meeting study objectives, and the components involved in encouraging/attaining these objectives. Certainly, it does not appear that the participant's confusion was due to a lack of clarification/explanation on the researcher's/instructor's part; in support of this, the participant affirmed that the researcher "always answered any (of her) questions fully". As well, feedback from the other participants evidenced that the premise and objectives of the study were clearly understood by them, and efforts on their part to attain these objectives were undertaken during their participation.

The workload/homework involved in the program were somewhat unpleasant for a few participants who expressed their disdain towards having "too much paperwork (it is

annoying even though its purpose is understood)", citing "prepping the logs" as their least favorite aspect of the program, and describing the program as "intensive" and "long". Ironically, it was also these very same demands of the study that motivated the same participants (who did not like the workload) and the others (who appreciated and enjoyed the workload) to become more active as they self-monitored/tracked their daily step counts, and from doing so, received feedback about their own activity performance at the end of each day and over time. Two participants did not feel that there were any "least favorite aspects" to comment on ("I enjoyed the entire program."; "Nothing comes to mind."). The reasons participants cited for missed attendance at the group dog walks included being out of town, dog illness, and having personal/family/work activities conflict with the scheduled group walks. Future studies should consider offering group dog walk options on various different days and times of the week, and/or extend the number of walks to accommodate unexpected events such as illnesses, vehicle breakdown, emergency work demands, or vacation plans. Simultaneously, to prevent (further) attrition and reduce unpleasantness and annoyance for participants, future studies should consider reducing measurement fatigue/workload on participants by extending measurement timelines, decreasing paperwork, and/or incorporating online and computer-based methods of data entry as an alternative to paperwork.

With regards to future program delivery, participants' suggestions include the use of online programs to address scheduling conflicts for participants who may be frequently out of town or otherwise occupied on weekends and thus cannot attend in-person programs, and the use of technological "apps" and "pinning" of group dog walk locations

to invite any dog owners to participate. One participant was averse to the idea of a telephone-based program, while another did not think a telephone-based program would be helpful. Majority of the participants still preferred to have in-person attendance at scheduled group dog walks ('Group walks create an opportunity for socialization both for me and my dog."; "I prefer the in-person scheduled walks.") and participate in a program that has interactive and social activities ("I prefer interactive activities."). Nevertheless, email-mediated and online social media dog walking interventions have been used effectively to encourage dog walking (Richards et al., 2016; Richards et al., 2017; Schneider et al., 2015), and a large extent of communication and information dissemination (including self-report data collection) in this present dog walking trial was facilitated via email and the Internet; thus, considering the popularity of technological advances, the convenience provided by mobile devices and technological programs, and the wider population reach that online programs can attain (Christian et al., 2016), future studies should consider offering more internet-based dog walking interventions, and/or combine the use of technological programs/mobile applications with in-person programs, similar to the study conducted by Schneider and colleagues (2015).

Additional feedback and comments from study participants

All study participants (in both experimental and waitlist-control groups) were encouraged to provide additional feedback and comments throughout and after the study, and program participants' feedback and comments provided in addition to the program

evaluation responses further support program acceptability outcomes. Please see Table 10 for a list of additional feedback and comments from study participants.

Through email and text messages, program participants thanked the instructor and also related their/their dogs' enjoyment of the group dog walks ("Good walk tonight."; "Thank you for the walk this evening. It was a good experience."; "*Dog* even had a bath to look her best!"; "*Dog* will go crazy when she sees the Gorge, then when she sees *instructor's dog*, she'll lose her marbles!"; "All of us really enjoyed our Sunday walks with the group."), their appreciation of the instructor's organization and presence/support ("Thanks for taking us on these trails and routes that have been right in front of me all these years and I've never noticed them!"; "Hope to see you soon, I'm off almost all the weekends in October so will be able to join you for walks."), how they benefitted from wearing the pedometer and walking daily ("The feedback from the pedometer encouraged me to start using my lunch hour to go for walks in order to log more steps and be active."; "I've lost some weight which is good too!"; "The worksheets and pedometer brought fitness and fitness goals to my attention over the summer which I think really helped. I'm going to get a Fitbit or something to track my steps because I found I would want to meet my daily walking step goals."), how their participation in the study motivated them to become more active during the week ("I found being a part of this study provided me with more tools and motivation to get out more."), and how the change in their physical activity behavior led to positive ripple effects at their workplace ("Coworkers noticed me wearing a pedometer and I told them about your study …

coworkers asked if they can join me on my walks … it is definitely a direct result of your study that this positive change has happened at my work place!").

The one partial non-compliant participant also emailed the researcher to express the participant's heartfelt apologies for missing majority of the walks and the non-submission of pedometry data and worksheets due to the participant's family, work, and travel demands during the summer season ("My sincerest apologies for not being a better study participant. I started out with the best intentions, but work, life and vacation got in the way. I did enjoy enjoy the experience and getting to know you. I hope the study is a success despite my poor contribution.").

In addition to program participants' feedback and comments, feedback and comments from one waitlist-control group participant support that the post-study group dog walks were also enjoyable and affirm that the quality of the group dog walks delivered by the instructor was consistent throughout the program and at post-study ("*Dog* slept all the way home. We both enjoyed meeting the group. I look forward to next week's walk"). As well, via a handwritten Thank You card, one waitlist-control group participant expressed her appreciation of the researcher's efforts in personally dropping-off and picking-up study materials/equipment at the participant's workplace, and thanking the researcher for her patience in the participant's delayed return of the study materials/equipment. This supports that the researcher's/facilitator's initiative, assistance, and attentiveness towards participants were extended to all study participants from start

of study to finish (i.e., no researcher bias towards participants in either group), and that these qualities/attributes were appreciated by both groups of participants.

The additional feedback and comments provided by program participants, external of the program evaluation survey, support that program participants genuinely enjoyed the group dog walks and benefitted from participation in the program; they also appreciated the presence/support of the instructor and the planned routes/location of the walks organized by the instructor. Program participants were open and eager to relate their experience and progress, and were comfortable to communicate their thoughts and updates with the researcher/instructor. The additional feedback and comments shared voluntarily, sincerely, and directly with the researcher/instructor separate from the program evaluation survey also aligned with program evaluation/overall satisfaction responses. This supports that the positive and constructive feedback/responses given in all sections of the program evaluation survey itself were also authentic and truthful, and that the non-anonymity of the program evaluation survey was not coercive in any way to the participants. As such, these additional feedback and comments further support program acceptability outcomes. Future studies may consider administering an anonymous program evaluation survey separate from the final online questionnaire should potential response bias be of concern; however, this may pose further inconvenience to program participants and thereby increase the likelihood that not all program participants will access or complete the program evaluation survey.

From the program evaluation responses and additional feedback/comments received, it can be concluded that the program was well received, enjoyable, purposeful, and benefitted the participants. Constructive feedback gathered from the evaluation survey provides suggestions for future improvements such as providing more scheduling/seasonal options for the group dog walks, extending the timeline of the study, having more (diverse) participants in the group walks/study, delivering online programs, involving the use of mobile technological applications, and having less workload/paperwork. In summary, program evaluation feedback supports that the program administered in this study was overall feasible and acceptable, and findings from this feasibility trial can now inform future large-scale interventions.

4:2 – Intervention Effects

The aims and objectives of feasibility randomized controlled trials differ from regular trials, with the rationale of a feasibility trial being a small-scale randomized trial that mirrors the intended efficacy study (Bowen et al., 2009), and to explore areas of uncertainty about the future definitive randomized controlled trial (Eldridge et al., 2016). With the need to derive an effect-size estimate for the treatment (intervention) preceding the mounting of a full evaluation trial (Bowen et al., 2009), this study aimed at exploring the direction of effects and obtaining a first estimate of expected effect sizes to gauge whether findings were in the right direction for a future definitive randomized controlled trial (Eldridge et al., 2016). Null hypothesis significance testing is not appropriate for feasibility studies unless the sample size is properly powered (Tickle-Degnen, 2013);

thus, the small sample size of this study is acknowledged as being underpowered for formal hypothesis significance testing. According to G*Power calculations (Faul, Erdfelder, Lang, & Buchner, 2007), for a full powered trial (power = .95) with a two-tailed hypothesis, a medium effect size (d = 0.5), a probability error of .05, and a 1:1 allocation ratio, a total sample of N = 210 (105:105) is required. To account for potential attrition, oversampling by 20% (N = 252; 126:126) is recommended.

Secondary hypothesis

It was hypothesized that receiving a program of six weekly scheduled instructor-led group dog walks supplemented with M-PAC construct intervention strategies would assist dog owners in the experimental group in achieving higher frequencies and intensities, and longer durations of dog walking/physical activity with dog per week compared to dog owners in the control group who do not receive the program. This hypothesis was supported.

As a result of participating in the program, experimental group participants increased their step counts by an average of 971 per day at week 6 and an average of 1,182 per day at week 9. They successfully achieved, on average, more than 10,000 step counts per day at the end of the program and at follow-up. Commensurate with public health step count recommendations of achieving 10,000 steps per day to improve health and as an indication of an active lifestyle (American College of Sports Medicine, 2011), this goal was achieved for program participants at the end of program participation and

also at follow-up. It can be surmised that this was accomplished by participants performing a combination or all of the following: (1) engaging in more walks (i.e., higher frequency of walks); (2) taking more steps using shorter strides performed at faster paces (i.e., increased intensity of walks); and (3) accumulating more steps through increased distance covered (i.e., longer duration of walks).

Compared to baseline, where program participants were not achieving recommended physical activity guidelines with or without their dog, participation in the program resulted in large effect sizes for *MVPA dog walking* at week 6 (partial eta squared = .30) and at week 9 (partial eta squared = .23) when compared to the waitlist-control group. At week 9, program participants had achieved – as well as exceeded – the recommended MVPA guidelines when it came to walking with their dog. Increases at week 6 and week 9 were also noted for *MVPA with dog* and *MVPA without dog*, with changes in *MVPA with dog* resulting in statistically significant large effects at week 6 and week 9 when compared to the waitlist-control group. Although *MVPA without dog* at follow-up (*M* = 146.25 minutes per week) was just under the recommended 150 minutes of MVPA per week, the combination of *MVPA without dog a*nd *MVPA with dog* at week 9 nearly doubled (*M* = 286.25 minutes per week) the minimum recommended guidelines of 150 minutes per week.

The notable objective outcomes of program participation in this study provide novel evidence that dogs do indeed act as catalysts for increased physical activity among dog owners, and this was achieved either through performing the activity of dog walking,

or participating in other forms of physical activities with their dogs, or both. Given that the outcomes of all three distinct categories of MVPA increased across time, these findings add to evidence from previous dog walking interventions and cross-sectional studies that dog walking (and physical activity with dog) does not occur at the expense or sacrifice of other forms of walking/physical activity performed without dogs (Rhodes et al., 2012; Richards, et al., 2017). These results support that the intervention effects were highly promising, and that a program such as the one administered in this exploratory trial has the potential to yield fruitful outcomes when it comes to encouraging dog walking and physical activity among dog owners.

It is also noteworthy that while the waitlist-control group participants received the identical educational handout listing the outcome benefits of regular dog walking at the start of the program, their receipt of this handout did not elicit changes in their behavioral and psychological outcomes. In addition, unlike in two previous dog walking randomized controlled trials where control group participants also increased their step counts simply as a result of their participation in the study without having received the intervention program (Byers, et al., 2014; Rhodes et al., 2012), the awareness of participation in the trial (and having access to/wearing the pedometer during monitoring phases) did not serve as impetus nor motivation to the waitlist-control group participants to make changes to or increase their dog walking or physical activity behavior during their participation in the study. Supporting what Rhodes (2017) posited regarding the intention-behavior gap, the waitlist-control group participants had enrolled in this trial with high intentions to make changes to their dog walking/physical activity behavior but

they subsequently fell short on following through on these intentions with actual action in the absence/without the help of the present intervention. Compared with the experimental group participants who received the intervention program, the outcomes contrasts between the experimental group participants and waitlist-control group participants shed increased light on the efficacy of the intervention program administered in this study, and highlight the importance and value of administering feasible intervention strategies for future dog walking studies.

Tertiary hypothesis

It was hypothesized that the M-PAC framework is an appropriate conceptual model to apply towards understanding and encouraging dog walking behavior among dog owners, with its appropriateness evidenced and measured through positive changes in program participants' reflective/motivational, regulatory, and reflexive processes across time. This hypothesis was supported.

The tertiary objective of this trial was to explore evidence for changes in M-PAC constructs that were purported to facilitate changes in dog walking behavior. When compared to the waitlist-control group, the effect sizes that were observed from positive changes across time in program participants' reflective/motivational (*affective judgments, opportunity*), regulatory (*planning*), and reflexive processes (*identity, habit*) were congruent with the tertiary objectives of this trial.

The M-PAC constructs of *affective judgments*, *opportunity*, *planning*, *identity,* and *habit* were targeted through the use of M-PAC construct assigned worksheets. *Capability* and *outcome expectations* were not aggressively/explicitly targeted. *Intention* was not targeted at all. The experimental results of this study largely parallel the observational findings from Rhodes and Lim (2016), where affective judgments, behavior regulation, identity, and habit differentiated successful intenders from unsuccessful intenders. As well, the reflective/motivational and regulatory outcomes of this study align with findings from earlier dog walking research where dog responsibility (Brown & Rhodes, 2006; Lim & Rhodes, 2016), canine health outcome expectations (Rhodes et al., 2012), intrinsic motivation (Lim & Rhodes, 2016), and making time (Richards et al., 2016; Richards et al., 2017) were key to the enactment of regular dog walking behavior. The reflexive (*identity, habit*) outcomes of this study are novel to dog walking intervention literature and provide foundational support for further testing of the M-PAC framework in future dog walking intervention studies.

Reflective/motivational processes

Outcomes of *capability* (week 6: partial eta squared = .05; week 9: partial eta squared = .00), *human outcome expectations* (week 6: partial eta squared = .16; week 9: partial eta squared = .01), *dog outcome expectations* (week 6: partial eta squared = .01; week 9: partial eta squared = .00) suggest that these constructs may have had influence on action control at week 6 but the strength of their influence petered out over the longer term. Nonetheless, these findings provide support that using educational information can

be somewhat purposeful towards initiating/encouraging dog walking among dog owners, similar to what was done in an earlier dog walking intervention trial conducted by Rhodes et al. (2012). However, targeting instrumental attitudes/outcome expectations and perceived capability on their own may not have sufficient convicting strength to elicit long-term positive changes in dog walking behavior, especially among less motivated dog owners, or when positive affective judgments are decreased or absent (Rhodes, 2017).

Outcomes of *affective judgments* (*enjoyment*) at the end of the program (week 6: partial eta squared = .26) supports that higher levels of affective judgments distinguish between those who followed through successfully on their physical activity intentions and those who did not (Rhodes & de Bruijn, 2013b). Program participants reported more enjoyment when engaging in dog walking at the end of the program than when they did at baseline. This enjoyment aspect is consistent with findings from previous cross-sectional and intervention studies where enjoyment (intrinsic motivation) is a key motivating factor in encouraging dog owners to exercise with their dogs (Kushner et al., 2006), and in the enactment of regular dog walking behavior (Lim & Rhodes, 2016; Rhodes & Lim, 2016). Through completing exercises on the *enjoyment* worksheet, program participants were able to cognitively self-reflect on the enjoyable and motivational reasons, locations, and social experiences associated with their dog walking sessions; thus, it can be suggested that the supplementation of this worksheet was efficacious when used together with the program of in-person group dog walks.

Even though the group dog walks did not specifically target factors associated with enjoyment and motivation, program participants could have inadvertently derived enjoyment and motivation from related factors associated with attending the group dog walks, such as the routes/location/season of the walks, social interaction within the group, having a qualified instructor provide motivation/support and supervision/education, bonding experience with their dog during the walks, appreciating/benefitting from the healthful value of the walks, feeling a sense of increased safety walking with a group, enhanced perceptions of relatedness/belonging walking with a group of dog owners working towards similar goals, having photos taken with their dog in the group walks, and delighting in watching their dogs enjoy the (occasional) dog treats that were given out after the walks. Worksheet responses, program evaluation feedback and additional feedback/comments received strongly support these observations.

The enjoyable aspects associated with the in-person group dog walks aligned with the correlates of dog walking associated with social support, outcome expectations, and the built and physical environments (Westgarth et al., 2014), and are analogous with the M-PAC construct of *affective judgments* associated with individual (owner's enjoyment related to bonding with their dog), social (walks with other dog owners), and environmental/policy factors (pleasant walking conditions related to environmental design and having dog-friendly amenities) (Rhodes & Lim, 2016). These motivational and pleasure-inducing elements, which enhanced the group dog walking experience for program participants, also impacted their overall positive behavioral outcomes. It can hence be suggested that program participants who held perceptions of higher pleasure

(i.e., increased values of positive *affective judgments*) from attending the group walks adhered more to their intentions of behavior change, and thus followed through with the behavior (Rhodes, 2017) resulting in measurable and positive behavioral changes across time. Future studies should tailor dog walking interventions that provide dog owners with enjoyable and pleasant dog walking experiences which they would feel motivated to relive and re-enact regularly, and address aspects deemed unenjoyable/unpleasant by individual dog owners that may act as deterrents to walking with their dogs.

Regulatory processes

The inclusion of volitional regulation behaviors are the hallmark of most action control models to maintain or augment intentions (Rhodes & Yao, 2015), and the use of behavior change strategies in dog walking intervention trials – such as self-monitoring, making time, and creating specific action plans – have been shown to be effective towards encouraging dog owners to walk their dogs more and maintaining that behavior over the long run (Richards et al., 2016; Richards et al., 2017). The outcomes of *planning* (week 6: partial eta squared = .22; week 9: partial eta squared = .19) in this trial support the use of such strategies within the M-PAC framework to encourage increased dog walking. Targeting the *planning* construct through the use of the *planning* worksheet together with other self-monitoring and behavioral regulation strategies (i.e., tracking step counts, scheduling and attending weekly group dog walks, increasing volume of dog walks during the week, backing-up missed plans) appears to have been efficacious in encouraging participants to make detailed dog walking plans throughout the first six

weeks and at follow-up, which in turn resulted in positive changes in behavioral outcomes (step counts/self-report MVPA) at each time point. Applying the M-PAC framework to a larger sample and actively targeting volitional behavioral regulation is recommended.

Reflexive processes

The top-ranked identities listed by participants in the *identity* worksheet were consistent with the identities that correspond with social structure such as parent, spouse, and employee (Charng, Piliavin, & Callero, 1988). Given that identities serve as personal standards of behavior (Stryker & Burke, 2000), it was evidenced that the increase in the strength of a dog walking exercise identity at week 6 and week 9 among program participants also corresponded with increases in behavioral outcomes at each time point. Outcomes of *identity* at week 6 (partial eta squared = .27) and week 9 (partial eta squared = .29) suggest that the exercise identity associated with regular dog walking was forged by the end of the program, and further strengthened at follow-up. *Dog responsibility*, which is closely associated with the reflexive identity of being a responsible dog owner, had no effect at week 6 (partial eta squared = .00) but had a small effect at follow-up (partial eta squared = .03). These *identity* and *dog responsibility* outcomes (together with *habit* outcomes) support that longer term physical activity patterns are linked to reflexive constructs, and also include reflective/motivation constructs and regulatory behaviors (Rhodes, 2017).

Results of *opportunity* (partial eta squared = .11) and *habit* (partial eta squared = .23) at week 9 indicate that program participants required less conscious remembering to walk their dogs at follow-up, which support that the study's objective of building up the habit of regular dog walking through the use of daily dog walking opportunities was achieved. This was a desirable outcome given that dog walking post-intervention had successfully become a reflexive behavior rather than a conscious task which program participants still had to laboriously remind themselves to undertake. Learning how to identify and respond to daily cues as the opportunity to walk one's dog through the use of the *opportunity*/*habit* worksheet resulted in the adoption and maintenance of habitual dog walking for program participants. It appears that practicing the use of daily opportunities to walk one's dog ultimately resulted in positive behavioral outcomes evidenced in program participants' attainment of higher step counts (average daily/total weekly) and meeting/exceeding recommended MVPA guidelines at follow-up (i.e., total weekly *MVPA dog walking*, and total weekly MVPA – *MVPA with and without dog*). Considering that the program timeline of six weeks was put on trial as part of the intervention, these findings align well with the approximate 6-week timeline that is required to establish an exercise habit (Kaushal & Rhodes, 2015). Future studies should design interventions with no less than 6 weeks of program timeline, and preferably incorporate longer program timelines/longitudinal study designs in order to encourage/examine the development of long-term regular exercise habits.

The results of the study support the testable assumptions of the M-PAC framework (Rhodes, 2017). From the study's findings, it can be inferred that action

control of dog walking was linked more to reflective/motivational processes of affective judgments and perceived opportunity, and less to instrumental attitudes/outcome expectations and perceived capability. In addition, action control in the initiation of dog walking was linked more to reflective/motivational constructs (c*apability, outcome expectations – human and dog, affective judgments*) and regulatory behaviors (*planning*), and less to reflexive processes. On the contrary, maintaining action control of dog walking over the longer term was linked more to reflexive processes (*identity, dog responsibility, habit*), but also included reflective/motivational constructs (*opportunity, human outcome expectations*) and regulatory behaviors (*planning*).

As well, reflective/motivational constructs can be said to have preceded regulatory behaviors even though reflective/motivational and regulatory processes nevertheless have reciprocal deterministic relationships across time (Rhodes, 2017). Prior to participating in the study, program participants would have already reflected on the motivating reasons (e.g., pleasure, benefits) to participate in the study; subsequently their exposure to the *outcome expectations* and *enjoyment* worksheets before and during the program (respectively) and their participation in the enjoyable group dog walks likely served to reinforce/enhance these reflective/motivational processes. Notwithstanding, future studies should consider explicitly targeting *affective judgments* earlier in the program (e.g., administer the *enjoyment* worksheet before the other M-PAC constructs worksheets) and examine whether this strategy would augment (positive) results.

Finally, reflective/motivation and regulatory processes preceded reflexive processes, where program participants progressed from (1) reflecting on motivational reasons to walk their dog, (2) self-categorizing/ranking, reaffirming, and committing to their dog walking exercise identity, (3) making detailed plans to dog walk, (4) using daily cues to form regular dog walking habits, (5) attending the scheduled weekly group dog walks, to (6) maintaining their dog walking exercise identity and keeping up the positive changes in their dog walking behavior at follow-up. Ultimately, it is acknowledged that reflective/motivational processes, regulatory processes, and reflexive processes do have reciprocal deterministic relationships across time (Rhodes, 2017).

These exploratory but promising tertiary outcomes provide the basis that the M-PAC framework is applicable for the examination of dog walking behavior and is suitable for use in the promotion of increased dog walking.

4:3 – Strengths of the Study

Study design and fit

One of the major strengths of this study is its randomized controlled trial study design. The randomized controlled trial is the most scientifically rigorous method of hypothesis testing available (Last, 2001) and is regarded as the gold standard trial for evaluating the effectiveness of interventions (McGovern, 2001). Attrition in the study was also controlled for with a waitlist option where the program was offered to the

waitlist-control group participants at the end of the study; that is, the waitlist-control group participants were given the option to receive the full program (inclusive of M-PAC construct worksheets) or simply attend the post-study group dog walks according to their availability.

The study objectives also sought to bridge knowledge-and-action gaps where a large physical activity intention-behavior gap still exists among community dog owners (Rhodes & Lim, 2016), and findings from this study can be said to have ecological validity and real-life implications. While knowledge translation from research into real world practice is generally an arduous 17-year pipeline process of meeting rigorous quality standards for the public, practitioners, and policymakers, and sometimes does not result in fruition at all due to lack of relevance/fit of evidence, and barriers to implementation (Green, Ottoson, García, & Hiatt, 2009), the use of program evaluation in this feasibility study – combined with the strength of the randomized controlled trial design, and the study's pragmatic community-based focus – further supports knowledge translation by offering relevant and applicable knowledge while being sensitive to local context involving key stakeholders (Donnelly, Shulha, Klinger, & Letts, 2016).

Season and location of group walks

Based on the program evaluation feedback, program participants reported that the location and routes of the group walks were enjoyable. Even though summer plans and holidays somewhat affected the group dog walk attendance, the warmer weather and

longer daylight hours were conducive to the outdoor nature of the group dog walking activity, making it more pleasant for participants and their dogs who were in attendance. Conversely, rainier, colder, and darker conditions during other seasons of the year may decrease overall enjoyment of dog walking.

The researcher's decision to set Gorge Park as the location for the group dog walks proved to be an appropriate choice as it was enjoyable and convenient for majority of the participants based on participants' worksheet responses and program evaluation feedback. "Gorge Park" was cited as one of the enjoyable locations at which program participants liked to walk their dogs, and was near to home for some, making it convenient for them to visit with their dogs. The program location (i.e., Gorge Park) was an aspect of the program which several program participants would like kept, even though some of these participants did not live within close proximity to the park. Gorge Park is easily accessible from various parts of the city and has ample parking availability. It is also well connected to other nearby parks and trails, allowing for more variety in routes, terrains, and sights to be explored and experienced.

Gorge Park has washroom amenities for park-visitors and good designated pathways for dog walking. The park is generally not overly crowded nor is it isolated, which offers a balance of safety and privacy while still being outdoors. There is beautiful outdoor scenery with water views to be appreciated, and the provision of dog-friendly features – such as water fountain for dogs and dog poo bags – makes it supportive for the activity of (group) dog walking. These pleasant and conducive features of the location

where the program of group dog walks was held support the environmental correlates of dog walking (Westgarth et al., 2014).

Canine eligibility criteria

While the stringent dog eligibility criteria may have deterred recruitment for less social dogs, participating dogs in the program were friendly to one another which likely added to the overall positive affective experiences of the group dog walks for the dogs (i.e., dogs were happier and felt safer in the company of other friendly and respectful dogs) and also their owners (i.e., increased sense of safety and peace of mind for everyone involved). The leashed-only group dog walks also ensured that dogs were duly leashed and not free roaming; thus, any brief dog-to-dog greetings (such as rear-sniffing) were closely supervised and under the control of their respective and competent owners.

Instructor/facilitator/researcher

The certified fitness instructor (NSCA-CSCS, CSEP-CPT certified) who conducted the group dog walks is canine first aid certified and has had 17 years' of experience teaching fitness and exercise to various demographics (i.e., adults, seniors, youth, military, post-rehabilitation). She is trained in many areas of fitness disciplines related to cardiovascular, strength, and flexibility training, and has a track record of leading individual participants and teams in local municipality fitness challenges to achieve winning titles and awards for "Most Active Team", "Best Overall Improvement",

and “Best Attendance at Sessions”. She has also received recognition as an “Outstanding Employee” for her hardworking initiative and dedicated support (“She was the go-to instructor, always available and eager to help out her colleagues by subbing when needed and often with little notice.”), for her strong teaching ability (“Her classes are fun, interesting, and I consistently get a great workout.”; “I really loved your Yoga classes and always thought you were a great teacher.”; “You’re my favorite Spin instructor!”), and creative planning skills (“She is an excellent instructor. I believe this is due to the amount of planning she puts into each class. I have never heard of an instructor putting in this much preparation. As a result, her classes are of a very high quality.”), all of which higher management at the workplace (“Great job training your team. You have inspired your team to make lifestyle changes that will last forever!”) and community participants appreciated, enjoyed, and benefitted from (“I loved it. I wish we were going to be all together longer.”; “Huge THANK YOU to you for spending that time training us, answering our questions, and showing us the proper way to train. You are marvelous!).

Additionally, she has had first hand experience as a dog owner having owned several large-sized high-energy dogs during her lifetime, including at the time of conducting the study. Upon participants’ request during the first group walk, the instructor brought along her own dog to the subsequent five group walks; as a result of doing so, it enhanced the sense of relatedness between the participants and the instructor, increased the credibility of the instructor, strengthened the premise of the study objectives, and made the participants feel genuinely supported having an instructor who “walked the talk, and walked her dog”.

The combination of the instructor's fitness knowledge, teaching background, and dog ownership status/experience provided integrity, conviction, and added value to the study ("very well-formed about what she was attempting to accomplish"). Her bona fide and personable approach ("the researcher was always very positive and encouraging, pleasant to work with"), attentiveness ("prepared to listen to any concerns"), and efficiency to respond to queries and troubleshoot issues ("The researcher was very pleasant to deal with me at all times, very nice person, and always answered any questions fully.") further added to the overall positive participation experience for program participants as evidenced from their additional feedback ("It was a true pleasure getting to know you.").

4:4 – Limitations of the Study and Future Recommendations

There were several limitations to the study worth noting and recommendations for future studies are provided to address these limitations.

Generalizability

The mostly female sample may not generalize to males, and self-selection to participate by motivated dog owners may not generalize to less/non-motivated dog owners.

For the purpose of group safety and risk prevention for both humans and dogs attending the group dog walks, administering two sets of eligibility criteria – one for dog owner and one for dog – was deemed necessary. However, having a dual screening criteria hindered the recruitment of a larger sample. Results from this study may not generalize to dog owners who own dogs that (1) are non-friendly or who are aggressive to other dogs/humans, (2) are non-spayed/neutered, (3) have medical conditions or specific breed traits (e.g., brachycephalic) that make exercising challenging for them, especially during warmer temperatures. Future studies could look into modifying (with caution) the eligibility criteria to allow more dogs to participate or offer more autonomous forms of dog walking interventions for the dog owner and dog, where the pair can perform their dog walking activity without the need of a group, where they can choose the people and familiar dogs whom they wish to perform their walks with in order to avoid any potential stranger dog-to-dog aggression.

Greater Victoria, BC, Canada, experiences a relatively mild climate throughout the year compared to other parts of Canada. This means that even though the summers are warm, they are not swelteringly hot or unbearably humid making it impossible to walk one's dog during summer. Thus, findings from this summer dog-walking study in Greater Victoria, BC, Canada may not generalize to other regions subjected to different climates and seasonal temperatures.

This study adopted an open parallel design. Participants were aware of their group assignment after randomization. Non-blinding of group assignment may have affected the

subsequent motivation levels and behaviors of participants. Future studies should incorporate the use of single blind or double blind experimental designs to reduce bias. As well, future studies should apply the use of mixed methods design in order to have a substantial qualitative component to enrich the findings and compensate for the limitations of quantitative methods (Pluye & Hong, 2014). An example of this would be to integrate and conduct go-along interviews during the in-person group dog walks. The go-along interview is a format in which participants take an active role in shaping the interview, and it facilitates identification of resources that might be overlooked using traditional interview formats (Garcia, Eisenberg, Frerich, Lechner, & Lust, 2012). The go-along methodology is promising for researchers wanting to ground health-promotion efforts in the context of environmental or community-based strengths and needs (Garcia et al., 2012).

Due to its exploratory nature, the 6-week duration of the study was considerably short, coupled with the small sample size, findings from this study may not generalize to larger studies spanning over longer terms. It is recommended to scale up future studies to recruit a larger and more diverse sample, and implement a longitudinal study design to examine the long-term effects of the intervention. Longitudinal study designs also allow for the timeline between monitoring phases to be extended, and this an important consideration in order to reduce measurement fatigue/workload burden on participants, and to prevent unpleasantness and (further) attrition.

Measurement device

Pedometer devices were non-invasive and easy to use, and unlike accelerometers, there was no inconvenience to participants to repeatedly return and pick-up devices from the researcher/lab after each monitoring phase. Unlike with accelerometers, there was no need for specialized or costly data download software, and participants were able to monitor/track daily step counts on their own and replace batteries independently (with the spare batteries provided by the researcher ahead of time) without the need to repeatedly return the device for computerized battery recharging (which accelerometers require). However, pedometers do not provide objective information regarding the intensity levels of dog walking and physical activities performed by the participants. Future studies should incorporate the use of accelerometers, or a combination of accelerometers and pedometers, to objectively measure MVPA. It is also advisable to provide hassle-free return/pick-up of accelerometers to participants with the help of research assistants/volunteers, or to reimburse participants the costs of mailing devices back by registered mail (recommended due to the high costs of accelerometer devices and to reduce risk of lost packages and vital data). Thus, obtaining funding support to cover equipment costs, human resources, and insured postage is highly recommended to meet these needs.

Seasonal, weather, venue, schedule

The summer season during which the study took place deterred several interested respondents from taking part due to pre-planned travel/vacation plans that would have interfered with their attendance at the scheduled weekly group walks. Such plans also interrupted some of the program participants' attendance at the group dog walks. Due to the warmer summer temperatures, interested dog owners who owned dogs (e.g., pugs) were deterred from participating as their dogs' breed traits (e.g., brachycephalic) would have exposed the dogs to increased risk of respiratory distress and overheating issues if they exercised at higher temperatures. It is recommended that future studies look into offering group walks during cooler seasons of the year to accommodate most dog breeds (if not all) and otherwise generally healthy dogs to exercise safely.

The single fixed location of the group walks was challenging for some participants living further away. One program participant from Ladysmith experienced a vehicle breakdown en route to the group walk and was rendered unable to participate in that session altogether due to the lack of a working vehicle, the overall travel time needed to commute to (and fro) the location of the group dog walks from where she lived, and the prohibition of large dogs on BC Transit that ruled out travelling via public transportation as an alternative and affordable option. Interested respondents living in farther neighborhoods, such as Sidney, also found the travel to-fro the group walk location time-consuming and thus declined to participate as they were able to walk their dog within their own neighborhood. As well, it was possible that interested dog owners

who did not live closer by and who did not drive would have found it difficult (if not impossible) to access the group dog walk location without a vehicle to transport their dog in. These challenges are legitimate and acknowledged, thus future studies should look into offering group walks in various locations within the city to accommodate dog owners/participants living in different neighborhoods to reduce time and transportation/logistic barriers to participation.

In addition to offering more locations, providing options for different days and times of the week would also appeal to more dog owners and participants. It was noted during recruitment that interested dog owners who preferred walking with their dogs in the mornings found the evening timing of the group dog walks inconvenient and unsuitable to their daily routine. Due to the small sample size in the study, offering an alternate location and timing could not be warranted, and doing so would have potentially further reduced the group size. Thus, it is recommended that future studies offer a variety of schedule options to cater to an assortment of dog owner schedules and preferences. Having alternate schedule/venue options can also serve as back-up/coping plans for participants who may miss some walks at a designated location/day/time, and who wish to make up for these missed walks.

Funding support

The ability of future studies to advertise rolling recruitment and strategize recruitment waves through media and social media to reach larger population numbers

(Christian et al., 2016) would be possible with the help of funding support considering the high costs involved in such methods of advertisement and recruitment (although there were no such costs involved for this study). It does appear that the reach and extent of media and social media far surpasses the use of costly printed posters, is environmentally friendly (less paper consumption), and is less time-consuming than conducting in-person recruitment.

Although participation in the study was free of charge, there were associated costs involved for a number of study participants to obtain medical/veterinary clearance to participate. These associated costs likely also deterred recruitment of a larger sample. Thus, in order to reduce/overcome indirect monetary barriers to participation, it would be feasible for future interventions to obtain funding support to reimburse participants for any medical/veterinary costs incurred related to participation.

Participation incentives offered during the study did not appear to appeal to the participants even though the incentives were largely health and canine-related. Participants, however, welcomed the complimentary health goodie bags, dog cookies/treats, and draw prizes as these were at no extra costs to them. Taking this into consideration, future studies should consider offering honorariums for participation in lieu of other incentives and having funding support would enable this.

Finally, having funding support would facilitate a multi-site approach to be carried out, thereby enabling a larger sample to be recruited and retained. Increased costs

related to human resources, equipment and materials, reimbursements of medical/veterinarian clearance costs, and incentives/honorariums for participants are to be expected and prepared for with the implementation of a multi-site study.

4:5 – Conclusions

This was the first study to examine the use of the M-PAC framework in dog walking intervention research. This study was a 9-week open parallel feasibility randomized controlled trial exploring the feasibility, acceptability, and efficacy of a dog walking intervention program consisting of six weekly scheduled instructor-led group dog walks supplemented with M-PAC construct intervention strategies to encourage increased dog walking among dog owners in Greater Victoria, BC. The primary, secondary, and tertiary outcomes of this trial support that such a program is in demand, and that the program administered was feasible, acceptable, and efficacious towards encouraging dog walking through the delivery of weekly scheduled instructor-led group dog walks supplemented with M-PAC construct intervention strategies.

Objective outcomes comprising of program participants' *total weekly step counts* and *average daily step counts* increased at the end of the program (week 6) and also at follow-up (week 9), resulting in large effect sizes when compared to the waitlist-control group. Self-report outcomes of *MVPA dog walking*, *MVPA with dog*, and *MPVA without dog* increased at week 6 and at week 9, with *MVPA dog walking* and *MVPA with dog* resulting in large effect sizes at both time points when compared to the waitlist-control group. At week 6 and week 9, program participants were achieving on average above

10,000 steps per day; at week 9, they had achieved – as well as exceeded – the 150 minutes recommended guidelines for *MVPA dog walking* alone, and almost doubled the 150 minutes recommended guidelines for total weekly MVPA (*MVPA with dog* and *MVPA without dog* combined).

For tertiary outcomes, at the end of the program (week 6), *capability* and *dog outcome expectations* resulted in small effect sizes when compared to the waitlist-control group, *human outcome expectations*, *affective judgments*, *planning*, and *identity* resulted in large effect sizes when compared to the waitlist-control group. At follow-up (week 9), when compared to the waitlist-control group, *human outcome expectations* and *dog responsibility* resulted in small effect sizes, *opportunity* resulted in a medium effect size, and *planning, identity* and *habit* resulted in large effect sizes.

While earlier dog walking interventions have also wrought positive results in behavioral and psychosocial outcomes (Christian et al., 2016; Westgarth et al., 2014), the intervention effects of this feasibility trial present as remarkably promising given its exploratory nature and its small sample size, and it being the first study to pilot the use of the M-PAC framework in a dog walking randomized controlled trial. Program evaluation feedback further supports that the program was overall well received, enjoyable, and beneficial. It can be concluded that in-person attendance at weekly scheduled instructor-led group dog walks can provide dog owners with an enjoyable and purposeful means to increase their weekly dog walking volume (frequency, intensity, and duration).

Future studies can implement the use of these types of walks over longer periods of intervention timelines to encourage and cement long-term behavioral changes among dog owners who may not be adequately active with their dogs, and who may need added motivation/supervision from a qualified instructor and the social support of other dog owners to do so. It is also recommended that future interventions improve on providing more schedule/venue/seasonal options for the group dog walks, increase the study sample size, and consider offering online programs/mobile options to reach a wider audience and/or appeal to dog owners who prefer more autonomous forms of interventions.

In conjunction with volitional self-monitoring and the use of planning strategies, cognitively self-reflecting the motivational reasons for dog walking, prioritizing one's dog walking exercise identity, regularly reaffirming/committing to that identity, identifying daily cues and following through those cues with dog walking action, resulted in the adoption and maintenance of increased dog walking for program participants. These positive behavioral and psychological outcomes support the use of the M-PAC framework as an appropriate conceptual model in the examination of dog walking behavior among dog owners. Applying the M-PAC framework to a larger sample of dog owners and a longitudinal study design is recommended.

Taking all of the preliminary positive results of this study into account, it can be concluded that the intervention is suitable and ready to be tested in a full-scale trial.

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Table 1: Sample Demographics (Overall)

Characteristics	
Dog Owner Demographic Profile (*n* = 16)	
Age in Years:	
% 25 to 34	18.8
% 45 to 54	50.0
% 55 to 64	6.3
% 65 to 74	18.8
% 75 to 85	6.3
% Female	75.0
% Caucasian	100.0
% Completed 4-Year College & Above	62.6
% Above $100,000 Annual Income	56.3
% Full-time Employed	50.0
% Retired	25.0
% Married	62.5
% Presence of Yard	93.8
% Own a Vehicle	100.0
Health Profile	
Self-Reported Health (baseline):	
% Fair	12.5
% Good	43.8
% Very Good	37.5
% Excellent	6.3
% Smoker	6.3
Mean BMI (*SD*)	26.5 (4.3)
% Normal Weight	37.5
% Overweight	43.8
% Obese	18.8
Dog Profile	
Age in Months (*SD*)	42.7 (43.9)
% Female	43.8
% Healthy Dogs	100
% Normal weight	87.5
Dog Size:	
% Small	43.8
% Medium	25.0
% Large	31.3
Energy Level:	
% Low-to-Medium	12.5
% Medium	31.3
% Medium-to-High	37.5
% High	18.8

Table 2: Sample Demographics – Experimental and Waitlist-Control Groups

Characteristics	Experimental Group (n = 8)	Control Group (n = 8)
Dog Owner Demographic Profile		
Age in Years:		
% 25 to 34	12.5	25.0
% 45 to 54	50.0	50.0
% 55 to 64	12.5	-
% 65 to 74	25.0	12.5
% 75 to 85	-	12.5
% Female	75.0	75.0
% Caucasian	100.0	100.0
% Completed 4-Year College & Above	62.5	62.5
% Above $100,000 Annual Income	62.5	50.0
% Full-time Employed	50.0	50.0
% Retired	37.5	12.5
% Married	100.0	25.0
% Presence of Yard	87.5	100.0
% Own a Vehicle	100.0	100.0
Health Profile		
Self-Reported Health (baseline):		
% Fair	-	25.0
% Good	50.0	37.5
% Very Good	50.0	25.0
% Excellent	-	12.5
% Smoker	12.5	-
Mean BMI (*SD*)	24.7 (1.1)	28.4 (5.5)
% Normal Weight	50.0	25.0
% Overweight	50.0	37.5
% Obese	-	37.5
Dog Profile		
Age in Months (*SD*)	31.3 (37.2)	54.2 (49.4)
% Female	62.5	25.0
% Healthy Dogs	100.0	100.0
% Normal weight	87.5	87.5
% Overweight	-	12.5
Dog Size:		
% Small	62.5	25.0
% Medium	25.0	25.0
% Large	12.5	50.0
Energy Level:		
% Low-to-Medium	-	25.0
% Medium	12.5	50.0
% Medium-to-High	62.5	12.5
% High	25.0	12.5

Table 3: Multi-Process Action Control Reliability Scale

Constructs	Items	Phase	Cronbach Alpha
Reflective/Motivational			
Capability	(1) I am physically able to walk my dog regularly if I wanted to	Baseline	1.0
		Week 6	.99
	(2) I am capable to walk my dog regularly if I wanted to	Week 9	.99
Outcome Expectations	(1) I walk my dog to maintain/improve my health	Baseline	.64 (.63 human, .68 dog)
		Week 6	.72 (.74 human, .91 dog)
	(2) Walking my dog is good for my well-being	Week 9	.63 (.52 human, .65 dog)
	(3) Walking my dog provides me with social advantages		
	(4) Walking my dog makes him/her behave better		
	(5) Walking my dog is good for his/her well-being		
	(6) Walking my dog keeps my dog healthy		
Opportunity	1) I have the opportunity to walk my dog regularly if I wanted to	Baseline	1.0
		Week 6	.98
	2) I have enough free time in my schedule to walk my dog regularly if I wanted to do so	Week 9	.93

Table 3: Multi-Process Action Control Reliability Scale

Constructs	Items	Phase	Cronbach Alpha
Reflective/Motivational			
Affective Judgments	(1) I walk my dog because it's fun	Baseline	.96
		Week 6	.91
	(2) I enjoy my dog walking sessions	Week 9	-
	(3) I find dog walking a pleasurable activity		
	(4) I find dog walking a satisfying activity		
Regulatory			
Planning	(1) I kept track of my dog walking in an exercise diary or log over the past week (i.e., personal exercise diary/log)	Baseline	.82
		Week 6	.82
		Week 9	.74
	(2) I kept track of my dog walking in an exercise diary or log over the past week (i.e., study-related log sheets)		
	(3) I set short-term (daily or weekly) goals for dog walking over the past week		
	(4) I made detailed plans regarding what I would do if something interfered with my plans to engage in dog walking over the past week		
	(5) I reserved time in my daily schedule for regular dog walking over the past week		
	(6) I made plans concerning "when", "where", "what" and "how" I was going to engage in regular dog walking over the past week		

Table 3: Multi-Process Action Control Reliability Scale

Constructs	Items	Phase	Cronbach Alpha
Reflexive			
Identity	(1) I consider myself someone who is physically active with my dog	Baseline	.90
		Week 6	.89
	(2) When I describe myself to others, I usually include my involvement in physical activity with my dog	Week 9	.92
	(3) I have numerous goals related to being physically active with my dog		
	(4) Being physically active with my dog is a central factor to my self-concept		
	(5) I need to be physically active with my dog to feel good about myself		
	(6) Others see me as someone who is physically active with their dog		
	(7) For me, being physically active with my dog means more than just exercising		
	(8) I would feel a real loss if I were forced to give up being physically active with my dog		
	(9) Being physically active with my dog is something I think about often		

Table 3: Multi-Process Action Control Reliability Scale

Constructs	Items	Phase	Cronbach Alpha
Reflexive			
Habit	(1) I engage in dog walking automatically (e.g., without intending to do it)	Baseline	.93
		Week 6	.94
	(2) I engage in dog walking without having to consciously remember it	Week 9	.93
	(3) I engage in dog walking without consciously thinking about it		
	(4) I start dog walking before I realize I am doing it		
Dog Responsibility	(1) I feel pressure from my dog to walk him/her	Baseline	.73
		Week 6	.91
	(2) I feel an obligation to walk my dog regularly	Week 9	.73
	(3) I feel a responsibility to walk my dog regularly		

Table 4: Behavioral Outcomes of Intervention at Week 6 end-point and Week 9 follow-up

Constructs	Group	Baseline *M* (*SD*)	Week 6 *M* (*SD*)	CI	F	Partial Eta Squared	Week 9 *M* (*SD*)	CI	F	Partial Eta Squared
Step Counts - Total Weekly	Experimental	69,202 (21,631)	76,000 (18,377)	62,446 – 80,607	8.20	.41**	76,133 (13,841)	63,467 – 82,262	13.94	.54***
	Control	50,977 (30,180)	50,969 (18,761)	46,412 – 63,354			47,542 (16,892)	41,634 – 59,168		
Step Counts - Average Daily	Experimental	9,886 (3,090)	10,857 (2,625)	8,949 – 11,581	8.60	.42**	11,068 (1,704)	9,424 – 11,846	20.05	.63***
	Control	7,457 (4,179)	7,281 (2,680)	6,571 – 9,028			6,792 (2,413)	6,041 – 8,301		
MVPA Dog Walking	Experimental	91.25 (97.71)	145.00 (96.95)	123.05 – 228.75	5.44	.30**	160.63 (99.51)	119.78 – 265.40	3.91	.23*
	Control	177.50 (154.71)	123.75 (127.08)	40.00 – 145.71			127.50 (156.09)	22.72 – 168.34		
MVPA With Dog	Experimental	39.38 (73.89)	128.13 (100.14)	100.72 – 231.86	7.21	.36**	140.00 (115.85)	90.90 – 244.25	4.39	.25*
	Control	143.13 (140.84)	83.13 (125.95)	-20.61 – 110.53			84.38 (102.03)	-19.87 – 133.48		
MVPA Without Dog	Experimental	64.38 (80.42)	106.25 (92.69)	39.56 – 152.05	0.03	.00	146.25 (100.10)	75.93 – 195.71	1.96	.13
	Control	40.00 (56.32)	91.88 (91.57)	46.08 – 158.56			70.00 (90.87)	20.54 – 140.32		

Note: *$p < .10$, **$p < .05$, ***$p < .01$; MVPA = moderate-to-vigorous physical activity

Table 5: Multi-Process Action Control Outcome Effects of Intervention at Week 6 end-point and Week 9 follow-up

Constructs	Group	Baseline *M* (*SD*)	Week 6 *M* (*SD*)	CI	F	Partial Eta Square	Week 9 *M* (*SD*)	CI	F	Partial Eta Squared
Intention (log)	Experimental	0.92 (0.23)	0.87 (0.26)	0.69 – 0.91	.32	.03	0.89 (0.27)	0.71 – 0.96	.03	.00
	Control	0.81 (0.27)	0.76 (0.36)	0.72 – 0.96			0.80 (0.32)	0.72 – 0.98		
Reflective/ Motivational										
Capability (expo)	Experimental	124.96 (43.43)	106.75 (59.69)	83.74 – 147.14	.62	.05	106.75 (59.69)	74.59 – 156.29	.00	.00
	Control	148.41 (0.00)	141.11 (20.65)	100.72 – 164.13			122.27 (48.74)	72.74 – 154.43		
Human OE	Experimental	4.04 (0.70)	4.17 (0.82)	3.58 – 4.73	2.55	.16	4.08 (0.64)	3.69 – 4.46	.16	.01
	Control	4.00 (0.59)	3.54 (0.83)	2.98 – 4.13			3.96 (0.58)	3.59 – 4.36		
Dog OE (expo)	Experimental	105.41 (40.65)	115.93 (45.32)	86.19 – 148.04	.14	01	108.11 (37.38)	80.83 – 137.31	.06	.00
	Control	109.95 (38.97)	110.67 (43.41)	78.52 – 140.42			114.44 (41.25)	85.24 – 141.73		
Affective Judgments	Experimental	4.19 (0.79)	4.41 (0.44)	4.07 – 4.67	4.59	.26**	-	-	-	-
	Control	3.97 (0.92)	3.91 (0.52)	3.64 – 4.25			-	-		
Opportunity (expo)	Experimental	113.23 (48.55)	106.75 (59.69)	60.83 – 155.27	.02	.00	106.75 (59.69)	66.80 – 150.57	1.63	.11
	Control	124.96 (43.43)	105.25 (60.65)	56.73 – 151.17			75.48 (49.31)	31.66 – 115.43		

Note: *$p < .10$, **$p < .05$; OE = outcome expectations; log = log transformed; expo = exponentially transformed

Table 5: Multi-Process Action Control Outcome Effects of Intervention at Week 6 end-point and Week 9 follow-up

Constructs	Group	Baseline *M* (*SD*)	Week 6 *M* (*SD*)	CI	F	Partial Eta Square	Week 9 *M* (*SD*)	CI	F	Partial Eta Squared
Regulatory										
Planning	Experimental Control	2.94 (1.10) 2.71 (1.37)	3.46 (0.74) 2.60 (1.19)	2.82 – 3.98 2.08 – 3.25	3.67	.22*	3.31 (0.76) 2.54 (1.02)	2.68 - 3.85 2.01 – 3.17	3.13	.19*
Reflexive										
Identity	Experimental Control	3.54 (0.59) 3.46 (1.10)	3.89 (0.35) 3.33 (0.99)	3.51 – 4.22 3.01 – 3.71	4.69	.27**	3.64 (0.71) 3.00 (0.95)	3.22 – 3.99 2.65 – 3.42	5.24	.29**
Habit	Experimental Control	2.59 (0.79) 2.72 (1.40)	2.88 (1.04) 2.94 (0.94)	2.43 – 3.41 2.40 – 3.39	.01	.00	3.34 (0.79) 2.81 (1.33)	2.91 – 3.88 2.28 – 3.25	3.94	.23*
Dog Responsibility (expo)	Experimental Control	95.08 (54.18) 103.48 (43.67)	76.97 (49.60) 80.03 (48.93)	40.31 – 115.83 41.17 – 116.69	.00	.00	92.07 (44.48) 87.67 (46.16)	69.41 – 120.22 59.52 – 110.33	.35	.03

Note: *$p < .10$, **$p < .05$; expo = exponentially transformed

Table 6: Experimental Group Participants' Responses for Multi-Process Action Control Worksheets - *Planning, Identity, Opportunity/Habit,* & *Enjoyment* Constructs

Constructs	Responses			
Planning	Participant #1	Participant #2	Participant #3	Participant #4
1) What	1) Longer walks with *dog*	1) Take *dog* on longer walks, give *dog* more playtime with other dogs	1) More intense walks	1) More frequent walks
2) Where	2) Triangle Mountain, Royal Bay School field & surrounding paths	2) Elk Lake/Beaver Lake, Royal Oak Middle School field	2) Near home, Gorge Park	2) Butchart Gardens, Gorge Park
3) When	3) Early evening, after dinner, afternoons	3) Saturdays 10am, Wednesdays 7pm	3) 7am, 12pm, 5pm, 10pm	3) Several times a day
4) How	4) Leave from home, I'll drive to the school	4) I will drive there, walk there	4) Daily walks begin from home	4) Walk or by automobile
5) Time	5) 60 minutes	5) One hour, or 30 minutes	5) 25 to 30 minutes	5) 15 to 20 minutes
6) Equipment	6) Leash, walking harness, poo bags, make sure water bottle in car is full	6) Leash, poo bags, water, dog water bowl	6) *Dog* has a new little water bottle with a self-contained bowl	6) Usual walking equipment
7) Weather	7) Take my windbreaker, make sure doggy towels are in car	7) Dry towel	7) *Dog* has a raincoat which keeps her somewhat dry (& looks very smart) & an enormous stack of dog towels.	7) This is Victoria, we have all manner of rain gear
8) Problems	8) Procrastinating, feeling too tired	8) Sleeping in, there are no dogs for *dog* to play with	8) Inclement weather is the principal disincentive	8) Raining or very windy
9) Resolutions	9) Get into a routine, don't take on too much (like trying to clean the whole house in one day)	9) Set the alarm & go to sleep earlier, come to the field another day of the week	9) Walks shortened, not cancelled	9) Skip or shorten walks

Table 6: Experimental Group Participants' Responses for Multi-Process Action Control Worksheets - *Planning, Identity, Opportunity/Habit,* & *Enjoyment* Constructs

Constructs	Responses			
Planning 1) What 2) Where 3) When 4) How 5) Time 6) Equipment 7) Weather 8) Problems 9) Resolutions	Participant #5 1) Longer walks, more focused walks 2) Local parks, our neighborhood 3) Tuesday evenings, every Sunday 7pm 4) Drive, walk from our house 5) Park walk 100 minutes, group walk 100 minutes, regular walk 60 minutes 6) Doggy equipment, clothing for weather 7) Raincoat, doggy jacket/towel 8) Work events, family responsibilities 9) Walk while on the phone, walk before work, walk to do errands	Participant #6 1) Walks on trails in forested areas, walks where she has more interactions with dogs & people 2) East Sooke Park, Oak Bay Village, off-leash areas (e.g., Willows Beach) 3) Any time day/evening, I'm self-employed 4) I can either drive or walk there 5) Local walks 45 minutes, trails 2 hours 6) Nothing special for local walks, trails water 7) My dog doesn't enjoy walking in rain so I'd plan/cancel my plans around the weather 8) Social plans, unfavorable weather, work that arises suddenly, trail walks 9) Walk the dog first thing in the morning, find a friend who would like to do trail walks	Participant #7 1) More focused activity with my dog, exercises at the river, practicing recall on walks 2) Fuller Lake, TCH Trail, Mount Breton Golf Course 3) At 8pm, unless I'm work 4) I can walk or drive 5) Group walk 60 minutes, independent walks 45 minutes 6) Sandals, leash, whistle – I'm out in the boonies & there are potentially wild animals & crazed sex offenders in the busehs 7) Rubber booties, rain jacket, towels weather resistant cap 8) Physical pain 9) Plan to walk at 8pm (or earlier) & plan the rest of my chores after this	Participant #8 1) Longer walks, more hill, more strenuous 2) Gorge Walk Way & Park 3) Mornings/before dinner 4) I will walk 5) - 6) Leash & bags 7) Rain jacket 8) Work 9) -

Table 6: Experimental Group Participants' Responses for Multi-Process Action Control Worksheets - *Planning, Identity, Opportunity/Habit,* & *Enjoyment* Constructs

Constructs	Responses			
Identity - Top 5 Ranked	Participant #1 1) Wife/spouse's pal 2) Mother 3) Yogi 4) Dog Walker 5) Daughter	Participant #2 1) Hardworking working professional 2) Family-oriented 3) Dedicated dog parent 4) Caring friend 5) Netflix junkie	Participant #3 1) Cook 2) Bookworm 3) Dog owner 4) TV watcher 5) -	Participant #4 1) Companion to wife 2) Supportive of family/friends 3) Pet owner 4) Gardener 5) Home handyman
	Participant #5 1) Wife 2) Mother/mother-in-law 3) Caregiver/advocate/daughter 4) Breadwinner dedicated employee 5) Dedicated doggy parent	Participant #6 1) Mom to two dogs 2) Good wife - Dog walking fits in here - 3) Kayaker 4) Facebooker 5) Make house a happy home	Participant #7 1) Wife/mom to two dogs 2) Friend 3) Sister 4) Nurse 5) Dog walker	Participant #8 1) Husband 2) Father 3) Son 4) Soon-to-be grandfather 5) Realtor
Identity - Ways to Celebrate	Participant #1 1) Post pictures on Facebook	Participant #2 1) Taking photos with camera 2) Printing off photos with *dog*	Participant #3 1) Take photos of *dog* 2) Shop for things for *dog*	Participant #4 No response
	Participant #5 1) Comfortable walking shoes 2) Post photos to *dog's* Instagram account 3) Share stories & experiences with family & friends 4) Celebrate more health & birthdays as *dog* & I reap the health benefits of regular exercise	Participant #6 1) Rewarding *dog* for good volunteer work with a long & relaxing walk after 2) Finding fun new walking routes 3) Getting fun bandanas for *dog* to wear on walks 4) Getting friends without dogs to join us on walks 5) Talking to as many strangers as possible on walks 6) Taking pictures of *dog* in neat places on walks & posting on Facebook	Participant #7 1) *Dog* will get a new collar 2) I will endeavor to allow photos taken of myself & put them in visible places around my house	Participant #8 1) Healthy

Table 6: Experimental Group Participants' Responses for Multi-Process Action Control Worksheets - *Planning, Identity, Opportunity/Habit,* & *Enjoyment* Constructs

Constructs	Responses			
Opportunity & Habit	Participant #1 *Cue 1*: After dinner *Strategy*: *Dog* & I can go for at least a 30 minute walk after cleaning up the dinner dishes. *Cue 2*: In the morning, after getting ready for the day/before starting anything *Strategy*: *Dog* & I can go for at least a 15 minute walk after I get dressed in the morning.	Participant #2 *Cue 1*: After dinner meal for dog *Strategy*: Dinner takes place once per day around 5-6pm. I can walk my dog 15-30 minutes after dinner. *Cue 2*: Saturday & Sunday mornings *Strategy*: As I work Monday to Friday, I am unable to take *dog* out for a longer walk in the morning. For the days that I'm at home, I set an alarm so that I don't sleep in & take *dog* for a nice walk.	Participant #3 *Cue 1*: 7am, 12pm, 5pm, 10pm *Strategy*: The clock. These times correspond to before breakfast, at mid-day, before supper, before retiring for the day. *Cue 2*: When *dog* fusses/barks *Strategy*: When there is no obvious cause (e.g., visitors, other dogs barking, birds) & she has not had a recent walk, we take her for a short walk.	Participant #4 *Cue*: *Dog's* bathroom breaks *Strategy*: Before we leave the house prior to her confinement, upon our return home after her confinement & mid-way during her confinement if she is out with us. This is intended to provide her with a reasonable bathroom schedule & train her to expect a regular routine & make use of it.
	Participant #5 *Cue 1*: After breakfast *Strategy*: This happens once per day. I can walk *dog* after I eat & before I go for work (15 minutes walk). *Cue 2*: After dinner *Strategy*: This happens once per day. I can walk *dog* after I eat & Before I settle into evening relaxation (30 minutes minimum walk)	Participant #6 *Cue*: Late afternoon *Strategy*: I work at home & force myself to stop working at 4:30pm (using a computer alarm). Immediately going for a 45 minutes walk with *dog* is my reward.	Participant #7 *Cue 1*: Changing into street clothing from my work clothes *Strategy*: The dogs follow me around like really hairy JW's until I take them out, that's a good reminder. I remind myself they can't take themselves out, it's good for all of us, & I will feel good once I get home. *Cue 2*: Another thing I find helpful is that I will verbally promise them a walk. *Strategy*: Even though they are dogs, when I make a promise, I like to try & keep it.	Participant #8 Missing data

Table 6: Experimental Group Participants' Responses for Multi-Process Action Control Worksheets - *Planning, Identity, Opportunity/Habit,* & *Enjoyment* Constructs

Constructs	Responses			
Enjoyment - Reasons	Participant #1 1) Explore new places 2) Breath fresh air 3) Touch trees 4) Feel healthier 5) *Dog* makes me laugh	Participant #2 1) Bond with dog 2) Deepen relationship with husband if go together 3) Improve mood 4) Reduce stress 5) Forget about work	Participant #3 1) Visit with neighbors 2) Enjoy flowers & birds 3) Pleasant activity	Participant #4 1) Connect with neighborhood 2) Nature/seasons
	Participant #5 1) Time to bond with *dog* 2) Fresh air & exercise, feel our best 3) Connect with nature/neighborhood 4) A break from chores or other to-do's	Participant #6 1) I like to see how happy it makes her 2) I feel better physically after walking with her 3) People like to stop and pet her and chat about her 4) I like getting out into our neighborhood	Participant #7 1) Healthy for both myself & my dogs 2) "Living in the moment" like dogs 3) It's beneficial 4) It's peaceful	Participant #8 Missing data
Enjoyment - Locations	Participant #1 1) Havenwood Park 2) Lookout Lake 3) Royal Bay 4) Taylor Beach 5) Galloping Goose Trail 6) Up-island – Parksville Beaches	Participant #2 1) Mount Doug 2) Rithet's Bog 3) Elk Lake/Beaver Lake	Participant #3 1) Own street 2) Gorge Park 3) Government House Grounds 4) Westsong Walkway	Participant #4 1) Neighborhood 2) Gorge Park 3) Butchart Gardens
	Participant #5 1) Our neighborhood 2) Running errands in town 3) The beach 4) Nature trails 5) Pet friendly outdoor events	Participant #6 1) Off-leash beaches - for the view & for *dog's* enjoyment 2) Forest trails 3) Ocean-view paths (e.g., West Bay walkway) 4) New & different neighborhoods	Participant #7 1) Off-leash areas 2) Areas with few people 3) "Loop" rather than back track 4) Areas with walks at least 5km in length	Participant #8 Missing data

Table 6: Experimental Group Participants' Responses for Multi-Process Action Control Worksheets - *Planning, Identity, Opportunity/Habit,* & *Enjoyment* Constructs

Constructs	Responses			
Enjoyment - Social Experiences	Participant #1 1) Not looking for social experiences - so don't care	Participant #2 1) Walk around field where dog owners & their dogs meet to give *dog* an opportunity to play with other dogs	Participant #3 1) Better contact with neighbors 2) Pleasant for *dog* & us to meet friends/strangers with dogs	Participant #4 1) "In touch with the street" 2) Interesting to meet new dogs
	Participant #5 1) Running errands 2) Neighborhood - running into people & dogs we know 3) Pet friendly events – such as parades & other outdoor events	Participant #6 1) Fundraising walks for charities 2) Parades (Victoria Day, Gay Pride, animal rescue groups, etc.) 3) Events in Beacon Hill Park 4) Dog friendly stores 5) Festivals like Oak Bay Tea Party	Participant #7 1) Important for dogs to be socialized 2) Remind dogs they are dogs & not hairy people 3) Dogs get their exercise at dog parks with other dogs without me doing too much work 4) Personally prefer quiet areas with no interaction with others due to stressful & over-stimulating job	Participant #8 Missing data
Enjoyment - Others	Participant #1 1) Get hubby to accompany us more	Participant #2 1) Take *dog* & a friend for a walk (catch up with friend)	Participant #3 1) Dogs make the world a better place for their human companions	Participant #4 1) Owners & management of places have to ensure dogs do not make a nuisance of themselves for others
	Participant #5 1) Walking with a loved one or a friend allows for a good visit as well as exercise 2) Timing walks to connect with neighbors' dog walks to allow for a guest visit	Participant #6 1) If I could join a group that goes on forest hikes, as I don't feel comfortable going alone 2) Going to dog-friendly hotels and then exploring a new area	Participant #7 1) This study has made me more aware of many things when I'm walking my dogs, I'm now focused on my posture & stride, & like to set a specific length for my walks. 2) I keep an activity log & wear my pedometer which makes me accountable. I am consistently walking 5 times a week. 3) I consider weather & how I feel. If it is hot, I'll take the dogs for a walk & a swim after. 4) I take the dogs where they can run for at least part of the walk, so their whole time out isn't spent on a leash.	Participant #8 Missing data

Table 7: Program Evaluation Open-Ended Responses

Questions	Responses			
I participated in the study because …	Participant #1 I needed a way to commit walking my dog, to get my dog used to being around other dogs & to be involved in something different & interesting.	Participant #2 I wanted to create a habit of taking *dog* out for more walks & even though I didn't make all the walks, the reminder in the calendar reminded me to be more active.	Participant #3 It looked like an opportunity to spend extra time with my dog. It seemed like something that would be a benefit to both myself & my dog.	Participant #4 I thought the study might be interesting, & the scheduled walks would provide an additional opportunity to be out with my dog, & assist her with training.
	Participant #5 I wanted to get into a good walking routine with my puppy that would provide physical benefits for both of us.	Participant #6 I regularly walk my dog so thought it would be interesting to participate.	Participant #7 I wanted to be more accountable to myself for the time I actually walk my dogs on a daily/ weekly basis.	Participant #8 It was of interest to me.
Favorite aspect of program	Participant #1 Just to get out walking.	Participant #2 Keeping track of my steps. I'm thinking of getting a walking tracking device!	Participant #3 Walks through Gorge Kinsmen Park. It is a lovely park & I had not walked through some of the areas before.	Participant #4 The organized walks were opportunities for walks that were different & of greater duration. I enjoyed the interaction with other participants & the researcher. They are all interesting people.
	Participant #5 The group walks. It was a nice change of pace & provided social time.	Participant #6 The weekly group dog walks. I enjoyed meeting some of the people and their dogs.	Participant #7 Keeping a journal & seeing my level of activity with respect to walking.	Participant #8 Walking my dog, meeting some people.

Table 7: Program Evaluation Open-Ended Responses

Questions	Responses			
Least favorite aspect of program	Participant #1 Prepping the logs.	Participant #2 Remembering to track everyday. I'd add it to my agenda & set a reminder on my phone so that I didn't forget any days.	Participant #3 I enjoyed the entire program.	Participant #4 Too much paperwork. It is annoying even though its purpose is understood.
	Participant #5 The temperamental & unreliable pedometers.	Participant #6 Wearing the pedometer & tracking it daily.	Participant #7 Nothing comes to mind.	Participant #8 Log sheets.
Describe your experience in three words	Participant #1 1) Fun 2) Healthy 3) Happydog	Participant #2 1) Interesting 2) Intensive 3) Long	Participant #3 1) Enjoyable 2) Educational 3) Healthful	Participant #4 1) Interesting 2) Beneficial 3) Short
	Participant #5 1) Fun 2) Healthy 3) Enriching	Participant #6 1) Dogs 2) Walks 3) Confusing	Participant #7 1) Accountable 2) Fun 3) Healthy	Participant #8 1) Enjoyable 2) Social 3) Motivational

Table 7: Program Evaluation Open-Ended Responses

Questions	Responses			
Aspects to keep & why	Participant #1 Weekly group walks, provided pedometers, no forced social activities.	Participant #2 Duration. It was a long study but I think it was the best way to create a habit of tracking steps.	Participant #3 Weekly walks - these were enjoyable. Record keeping - it was interesting to see how many steps were done daily.	Participant #4 Diverse subjects, same vicinity, familiar dog walking activity.
	Participant #5 Frequency, duration, location.	Participant #6 Group dog walks, frequency, location.	Participant #7 Can't think of anything off the top of my head.	Participant #8 -
Aspects to change & why	Participant #1 Make data collection logs more user friendly, add some doggy activities during the group walks. Incentives to improve group walk attendance.	Participant #2 More participants – get to know more people & their dogs. More walking options – Sundays were pretty busy for me during summer.	Participant #3 All aspects of the program were fine & should remain the same. Prizes were not an incentive, would have enjoyed the program without them.	Participant #4 Have larger number of participants & a longer study duration. More rigorous "before" & "after" comparisons.
	Participant #5 Time of year, equipment, larger number of participants.	Participant #6 Much better clarity on the purpose of the study.	Participant #7 Happy hour for the humans & milk bone hour for the four-legged participants!	Participant #8 -

Table 7: Program Evaluation Open-Ended Responses

Questions	Responses			
Overall satisfaction (additional feedback)	Participant #1 Doing some major house repairs have made me too tired to walk my dog as frequently as I'd like over the last couple weeks.	Participant #2 I wish that I could have made more walks with *dog*.	Participant #3 I walk my dog four times a day for short periods. There are occasional times I walk with her which were not indicated on this questionnaire.	Participant #4 Most or all of the participants will want the study to succeed & have a vested interest in the outcome of the study, & this may skew the results.
	Participant #5 Other than being frustrated with my pedometers. I had a great time with this program. In talking about it with family & co-workers, I inadvertently inspired others to jump on the bandwagon. There is now a formal walking group at my place of employment. Family in Calgary has purchased Fit-Bits & challenged each other (with & without dogs) to step challenges!	Participant #6 I was & remain very unclear on what the purpose of the study was – what was actually being studied, what they were researching, etc. Several other walking group people I spoke with expressed the same. It was frustrating to us all that we had no concept of that.	Participant #7 The group walks could have been a bit more organized & routes planned out a bit more clearer.	Participant #8 Had pedometer issues.

Table 7: Program Evaluation Open-Ended Responses

Questions	Responses			
Program components & effectiveness (additional feedback)	Participant #1 -	Participant #2 The pedometer made me very motivated to get out of the house!!	Participant #3 I continue to walk my dog for the four daily walks that we had before the study. I'm aware now however that the speed of our walk needs to be increased. I've worked to limit my dog's sniffing & wandering. I was always interested each day to find the step counts & knowing my steps were being counted made me plan to do extra walking such as parking at the far end of the lot when going to the store.	Participant #4 Participants, whose habits & routines are fairly well-established & seemingly satisfactory, may not be particularly inclined to amend those habits & routines as much as the researcher might suggest. The pedometer has a purpose in a study of this sort. The original pedometer supplied was wildly erratic & obviously erroneous. Because these devices are erratic, they are not persuasive or particularly helpful, mostly just an annoyance.
	Participant #5 -	Participant #6 I didn't change anything over the course of participating in this. I didn't understand (not sure if it was made clear to some or not) what was the intent of this. Maybe it was supposed to remain unstated? I was very unclear on what was being studied, etc.	Participant #7 -	Participant #8 -

Table 7: Program Evaluation Open-Ended Responses

Questions	Responses			
Worksheets content & effectiveness (additional feedback)	Participant #1 -	Participant #2 -	Participant #3 I came to enjoy my walks as a time to be with my dog rather than something that had to be done.	Participant #4 I read through all the worksheets but was not persuaded that a lot of paperwork would be helpful.
	Participant #5 I feel these worksheets might be useful for people who lack insight to their motivations & behavior. Those that self-select for a study such as this might be a little more insightful & & motivated than most.	Participant #6 They seemed to me to be a very insignificant part of the project.	Participant #7 I already feel a strong responsibility to walk my dogs on a regular basis. Having the exercises was good for further self-reflection.	Participant #8 -
Suggestion/preference for future program delivery (online or telephone-based versus in-person)	Participant #1 An App! Pin a location & time on a map, inviting any dog owners to join. I'd check that out. Anything involving phoning I would avoid.	Participant #2 Possibly having an online program may be more effective for me as going on Sundays was a challenge - although it still motivated me to go for walks/be active throughout the week.	Participant #3 Probably not. Group walks create an opportunity for socialization both for me and my dog.	Participant #4 I would simply prefer to walk my dog, without a lot of protocols or procedures to follow.
	Participant #5 I prefer the in-person scheduled walks.	Participant #6 I don't think it would be more effective.	Participant #7 I prefer interactive activities.	Participant #8 -

Table 7: Program Evaluation Open-Ended Responses

Questions	Responses			
Attendance (reasons for missing)	Participant #1 Out of town.	Participant #2 I went on vacation & was out of town a lot. Was taking care of *dog* one week-end as he was ill.	Participant #3 Missed one walk, out of town	Participant #4 Out of town.
	Participant #5 -	Participant #6 Personal plans/activities on weekend were the reasons I missed some.	Participant #7 Vehicle issues, work schedule.	Participant #8 Sunday evenings are family dinner at my parents'.
Overall additional feedback	Participant #1 -	Participant #2 Thanks so much!	Participant #3 -	Participant #4 The researcher was always very positive & encouraging, pleasant to work with, prepared to listen to any concerns, & seemed very well-informed about what she was attempting to accomplish. Many thanks!
	Participant #5 Best of luck with your research & Master's thesis. It was a true pleasure getting to know you.	Participant #6 ___ (researcher) was very pleasant to deal with me at all times, very nice person & always answered any questions fully.	Participant #7 -	Participant #8 -

Table 8: Program Evaluation Closed-Rated Responses

Characteristics	Experimental Group (n = 8)
OVERALL SATISFACTION	
Use of Pedometer Devices:	
% Dissatisfied	12.5
% Neutral	37.5
% Satisfied	25.0
% Very Satisfied	25.0
Worksheets & Supplementary Materials:	
% Dissatisfied	25.0
% Neutral	12.5
% Satisfied	62.5
Number of Group Walks (6 Walks):	
% Neutral	12.5
% Satisfied	62.5
% Very Satisfied	25.0
Length of Group Walk Session (60-75 Minutes):	
% Satisfied	37.5
% Very Satisfied	62.5
Location & Routes of Group Walks:	
% Satisfied	50.0
% Very Satisfied	50.0
Time & Day of Group Walks:	
% Dissatisfied	12.5
% Neutral	12.5
% Satisfied	37.5
% Very Satisfied	37.5
Methods of Communication/Information Dissemination:	
% Satisfied	37.5
% Very Satisfied	62.5
Facilitator/Instructor:	
% Satisfied	37.5
% Very Satisfied	62.5
Troubleshooting & Resolutions (where applicable):	
% Neutral	25.0
% Satisfied	62.5
% Very Satisfied	12.5
Pick-Up/Drop-Off – Pedometers & Materials:	
% Neutral	12.5
% Satisfied	62.5
% Very Satisfied	25.0

Table 8: Program Evaluation Survey Closed-Rated Responses

Characteristics	Experimental Group (n = 8)
PROGRAM COMPONENTS & EFFECTIVENESS	
Group Walks	
Useful & helped met study objectives:	
% Disagree	12.5
% Neutral	37.5
% Agree	37.5
% Strongly Agree	12.5
Enjoyment of attending:	
% Neutral	12.5
% Agree	37.5
% Strongly Agree	50.0
Would recommend group walks to other dog owners:	
% Neutral	25.0
% Agree	25.0
% Strongly Agree	50.0
Pedometer Device	
Ease of use:	
% Neutral	25.0
% Agree	37.5
% Strongly Agree	37.5
Useful & wearing the device helped met study objectives:	
% Disagree	12.5
% Neutral	12.5
% Agree	62.5
% Strongly Agree	12.5
Recommend use of pedometer devices to other dog owners:	
% Disagree	12.5
% Neutral	12.5
% Agree	62.5
% Strongly Agree	12.5
Log Sheets & Tracking Step Counts	
Useful & helped met study objectives:	
% Disagree	12.5
% Neutral	25.0
% Agree	50.0
% Strongly Agree	12.5
Recommend use of log sheets & tracking step counts to other dog owners:	
% Disagree	12.5
% Neutral	25.0
% Agree	50.0
% Strongly Agree	12.5
Program increased motivation to make positive changes in PA & dog walking behavior:	
% Disagree	12.5
% Neutral	12.5
% Agree	37.5
% Strongly Agree	37.5
Program resulted in positive changes in PA & dog walking behavior:	
% Strongly Disagree	12.5
% Neutral	25.0
% Agree	25.0
% Strongly Agree	37.5

Note: PA = Physical Activity

Table 8: Program Evaluation Survey Closed-Rated Responses

Characteristics	Experimental Group (n = 8)
WORKSHEET CONTENT & EFFECTIVENESS	
Planning Worksheet	
Useful & provided new information/strategies:	
% Disagree	25.0
% Neutral	50.0
% Agree	12.5
% Strongly Agree	12.5
Utilized worksheet regularly to make dog walking plans:	
% Strongly Disagree	12.5
% Disagree	50.0
% Neutral	12.5
% Agree	25.0
Would recommend worksheet to other dog owners:	
% Disagree	37.5
% Neutral	37.5
% Agree	25.0
Exercise Identity Worksheet	
Useful & provided new information/strategies:	
% Disagree	25.0
% Neutral	50.0
% Agree	12.5
% Strongly Agree	12.5
Utilized worksheet regularly for reaffirmation of exercise identity:	
% Strongly Disagree	12.5
% Disagree	37.5
% Neutral	25.0
% Agree	25.0
Would recommend worksheet to other dog owners:	
% Disagree	37.5
% Neutral	37.5
% Agree	25.0
Opportunity & Habit Worksheet	
Useful & provided new information/strategies:	
% Disagree	12.5
% Neutral	50.0
% Agree	37.5
Utilized worksheet regularly when making dog walking plans:	
% Disagree	37.5
% Neutral	25.0
% Agree	37.5
Would recommend worksheet to other dog owners:	
% Disagree	25.0
% Neutral	37.5
% Agree	37.5

Table 8: Program Evaluation Survey Closed-Rated Responses

Characteristics	Experimental Group (n = 8)
WORKSHEET CONTENT & EFFECTIVENESS (continued)	
Enjoyment Worksheet	
Useful & provided new information/strategies:	
% Disagree	12.5
% Neutral	37.5
% Agree	37.5
% Strongly Agree	12.5
Utilized worksheet regularly when making dog walking plans:	
% Disagree	37.5
% Neutral	25.0
% Agree	37.5
Would recommend worksheet to other dog owners:	
% Disagree	25.0
% Neutral	37.5
% Agree	37.5
PROGRAM EFFECTIVENESS	
"I am now walking more with my dog per week":	
% Strongly Disagree	12.5
% Disagree	12.5
% Neutral	12.5
% Agree	50.0
% Strongly Agree	12.5
"I am now more physically active with my dog per week":	
% Strongly Disagree	12.5
% Disagree	12.5
% Neutral	37.5
% Agree	25.0
% Strongly Agree	12.5
"I am now more physically active overall per week":	
% Strongly Disagree	12.5
% Disagree	12.5
% Neutral	25.0
% Agree	37.5
% Strongly Agree	12.5
"I am now more aware of the different intensity levels involved in the physical activities I engage in":	
% Strongly Disagree	12.5
% Disagree	12.5
% Agree	50.0
% Strongly Agree	25.0
"I now would like more weekly scheduled group dog walks led by an instructor":	
% Disagree	25.0
% Neutral	12.5
% Agree	37.5
% Strongly Agree	25.0

Table 9: Group Walk Attendance

Individual	GW1	GW2	GW3	GW4	GW5	GW6	Total
Participant #1	Yes	No	Yes	Yes	Yes	Yes	5
Participant #2	Yes	No	No	No	No	Yes	2
Participant #3	Yes	No	Yes	Yes	Yes	Yes	5
Participant #4	Yes	No	Yes	Yes	Yes	Yes	5
Participant #5	Yes	Yes	Yes	No	Yes	No	4
Participant #6 (delayed 2 weeks)	NA	NA	Yes	No	Yes	Yes	3
Participant #7 (delayed 1 week)	NA	Yes	No	No	Yes	No	2
Participant #8 (delayed 1 week)	NA	No	Yes	No	No	No	1
Dropped-out Participant (delayed 1 week)	NA	Yes	NA	NA	NA	NA	1
Total	5	3	6	3	6	5	

Note: GW = Group Walk; NA = Not Applicable

Table 10: Additional Feedback & Comments from Study Participants

Medium	Feedback/Comments
Email	We're all set to be there (at the group walk). *Dog* even had a bath today to look her best!
Email	Good walk tonight. Thanks for taking us on these trails & routes that have been right in front of me all these years & I've never noticed them!
Email	Thank you for the dog walk this evening. It was a good experience. And thanks very much for the photos – they are lovely!
Email	Hi! Things are good, still walking/working and wearing my pedometer on an almost daily basis! I have lost some weight which is good too! I will send you my data log sheets in a couple of minutes. Sorry again for the delay ... I'm a good study participant, just a bit tardy. Hope to see you soon, I'm off almost all the weekends in October so will be able to join you for walks. *Dog* is getting a bit husky these days, the little piglet has been grazing on the plums in the yard that have fallen off the tree. I'd like just one day in her life …
Email	I thought you might like to hear about an unexpected result from this program! A couple of co-workers noticed I was wearing a pedometer, so I told them about your study. I mentioned how few steps I was logging during the work day. It got us talking about the dangers of sitting for too long. The feedback from the pedometer encouraged me to start using my lunch hour to go for walks in order to log more steps and get more active. This week, two co-workers asked if they can join me on the walks. By the end of this week, our lunchtime walking group has grown to five people! I know it's not dog walking related, but it is definitely a direct result of your study that this positive change has happened at my workplace!
Email	I found being a part of this study provided me with more tools and motivation to get out more. The worksheets and pedometer brought fitness and my fitness goals to my attention over the summer which I think really helped. I'm going to buy a Fitbit or something to track my steps because I found I would want to meet my daily walking step goals.
Email	My sincerest apologies for not being a better study participant. I started out with the best intentions but work, life and vacation got in the way. I did enjoy my experience and getting to know you. I hope the study is a success despite my poor contribution.
Email	Best of luck with the final stages of the study. All of us really enjoyed our Sunday walks with the group.
Email	You are welcome to invite the study participants to have an end-of-project gathering at our house, if you wish.
Text	*Dog* will go crazy when we approach the Gorge. Then when she sees *instructor's dog*, she'll lose her marbles!
Text	*Dog* slept all the way home. We both enjoyed meeting the group. I look forward to next week's walk.
Card	Thank you for your patience with the return of study materials. :) Wishing you and the study all the best! Can't wait to read the results.

Figure 1: Multi-Process Action Control Schematic

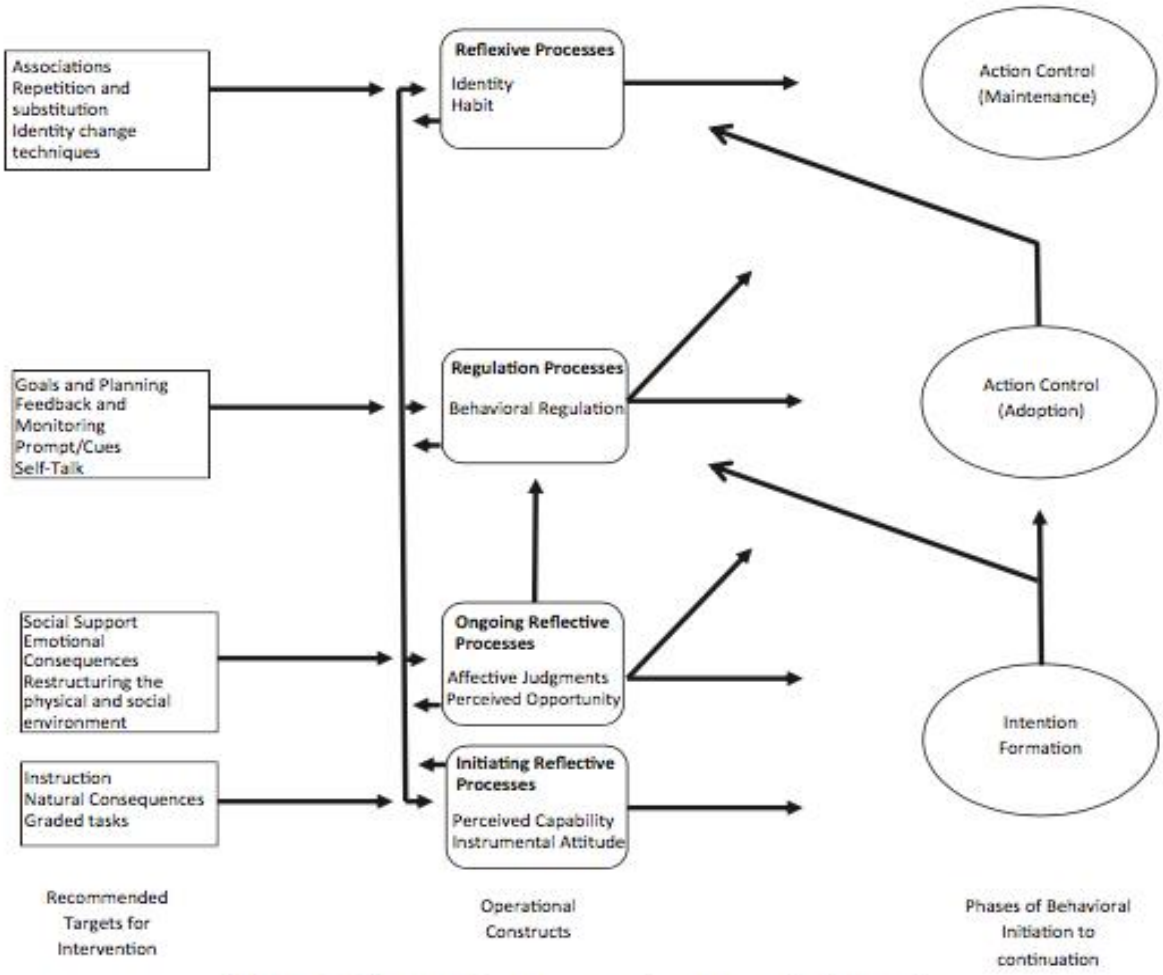
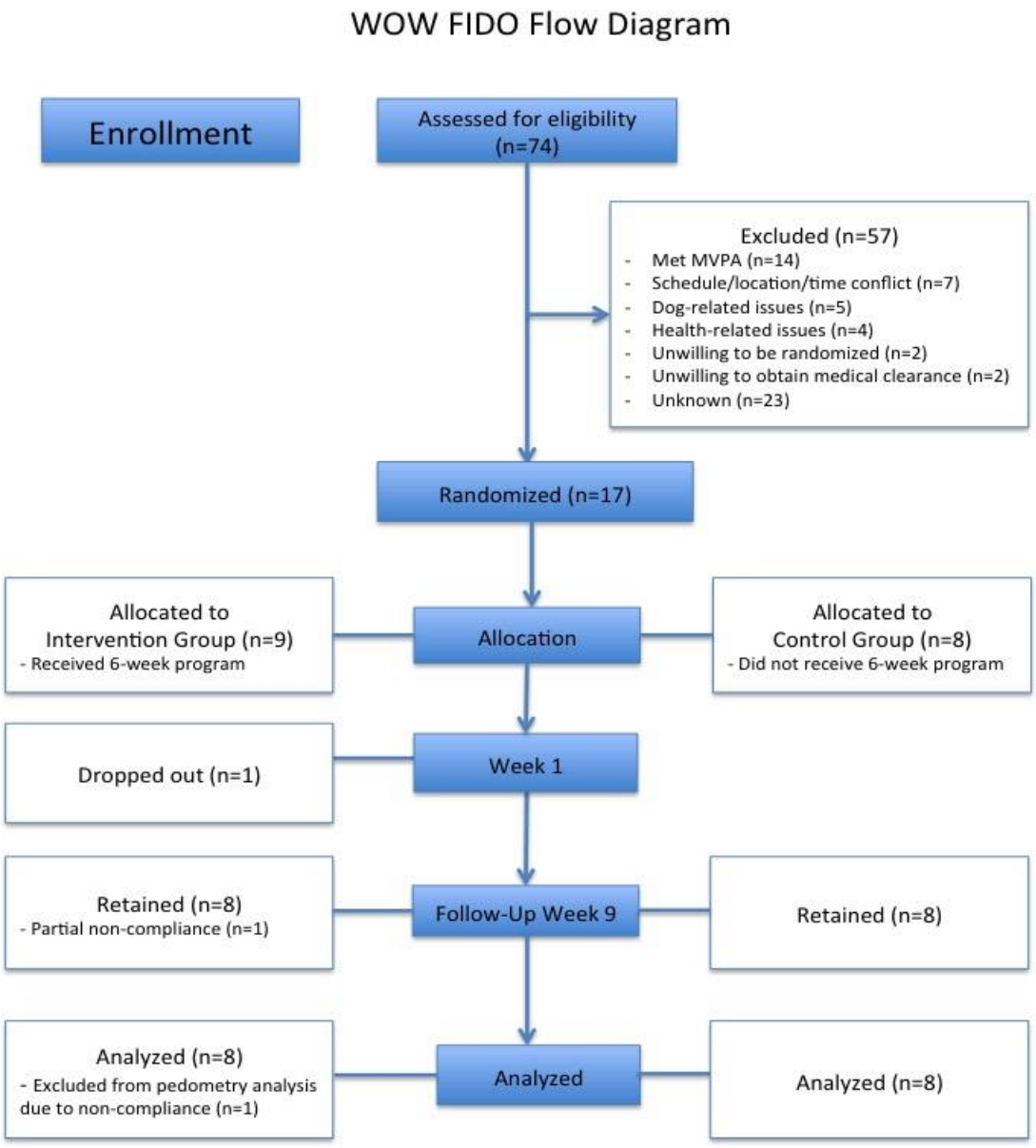


Figure 1 The multi-process action control schematic.

Figure 2: CONSORT Flow Diagram of Enrolment, Allocation, Follow-Up, & Analysis



Appendix A: Recruitment Poster

University of Victoria | Behavioural Medicine Laboratory

DOG OWNERS

Does your dog set the pace on your walks?
Do they sniff and smell while you stand and wait?
Are your dog walks long enough and challenging enough to get you healthy?

A whopping 60% of dog owners in Greater Victoria are not walking their dogs at intensities sufficient enough to reap health benefits for themselves, and as many as 50% of all dog owners are not walking their dogs at all.

Our objective is to help dog owners begin or maintain a regular dog walking habit that is enjoyable, achievable for all abilities, and beneficial for their health.

We are looking for dog owners to take part in a study examining group dog walks led by a certified health and fitness trainer.
The eligibility criteria to participate is as follows:
(1) you are an English speaking adult aged 18+ years living in Greater Victoria, BC
(2) you own a healthy and friendly dog aged 6 months or older
(3) you are interested to get more out of your current dog walks for both you and your dog
OR you are not currently walking your dog and would like to start

As a participant in this study, you and your dog will be asked to attend a weekly group dog walk for 6 weeks. We will monitor your physical activity using pedometers, and you will answer 3 online questionnaires about self-regulation strategies (e.g., scheduling, back-up plans) and your dog walking behaviour,.

The study will span across 9 weeks in total and there is no cost to participate. In appreciation of your time contribution towards health promotion and canine well-being, you will receive dog-friendly incentives and draw prizes.
For more information, please contact the researcher at email:
k9bmed@uvic.ca

Appendix B: Screening Form

SCREENING FORM

Thank you for your interest in our study. This study is very exciting and purposeful as it explores the use of a program involving the use of behavioral regulation strategies in combination with 6 weekly group dog walks (leashed) comprising of workout segments led by a certified fitness trainer as an intervention for dog owners to meet recommended physical activity guidelines (i.e., minimum 150 minutes of moderate-to-vigorous physical activity per week). Attendance at all 6 walks is not required.

This research uses randomization to put individuals into one of two groups - intervention group or comparison group. Both groups will be monitored across 9 weeks using pedometers and 3 online questionnaires. The comparison group has the option to receive the same program after 9 weeks, and no more data will be collected at this point.

Before enrolment in the study, there are a few questions you must answer to determine your eligibility to participate. Please fill in your name and answer YES or NO next to each question. There are a total of 15 questions.

Name: _____

1) Are you over the age of 18? _____
2) Do you live within Greater Victoria? _____
3) Do you own a healthy and friendly (spayed/neutered) dog above 6 months of age? _____

For the questions 4 to 7, please refer to the definitions and example provided:
Definition: Moderate = light perspiration from effort, a good brisk pace. Vigorous = heart beats rapidly, sweating, jogging, as fast as you can walk. Example: walking daily at a mild intensity or leisurely pace is not the same as moderate or vigorous intensity

4) Are you currently exercising a minimum of 150 minutes per week at a moderate intensity? _____
5) Are you currently exercising a minimum of 150 minutes per week at a vigorous intensity? _____
6) Are you currently exercising a minimum of 150 minutes per week at a moderate intensity with your dog? _____

7) Are you currently exercising a minimum of 150 minutes per week at a vigorous intensity with your dog? _____

8) Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor? _____

9) Do you feel pain in your chest when you do physical activity? _____

10) In the past month, have you had chest pain when you were not doing physical activity? _____

11) Do you lose your balance because of dizziness or do you ever lose consciousness? _____

12) Do you have a bone or joint problem (for example, back, knee, or hip) that could be made worse by a change in your physical activity? _____

13) Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition? _____

14) Do you know of any other reason why you should not participate in physical activity? _____

15) Are you willing to be randomly placed into either the intervention group or the comparison group? _____

***If your dog is over 7 years of age:** Please obtain a veterinarian clearance for your dog to participate in the study. The vet must clear the dog to participate in at least 30 minutes of moderate-to-vigorous intensity walking in all weather conditions. The cost, if any, of obtaining this clearance will be the responsibility of the dog owner wishing to participate in the study. Veterinarian clearance can be in the form of an email to the researcher directly from the veterinarian clinic.

Please check that you have completed all 15 questions with a Yes or No. Please resave the completed document with your first and last names in the file name and email the completed form back to the researcher at your soonest convenience. Thank you.

Appendix C: Physical Activity Readiness Questionnaire Plus Form (four pages)

CSEP approved Sept 12 2011 version

PAR-Q+

The Physical Activity Readiness Questionnaire for Everyone

Regular physical activity is fun and healthy, and more people should become more physically active every day of the week. Being more physically active is very safe for MOST people. This questionnaire will tell you whether it is necessary for you to seek further advice from your doctor OR a qualified exercise professional before becoming more physically active.

SECTION 1 - GENERAL HEALTH

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

If you answered NO to all of the questions above, you are cleared for physical activity.

Go to Section 3 to sign the form. You do not need to complete Section 2.

- Start becoming much more physically active – start slowly and build up gradually.
- Follow the Canadian Physical Activity Guidelines for your age (www.csep.ca/guidelines).
- You may take part in a health and fitness appraisal.
- If you have any further questions, contact a qualified exercise professional such as a CSEP Certified Exercise Physiologist® (CSEP-CEP) or CSEP Certified Personal Trainer® (CSEP-CPT).
- If you are over the age of 45 yrs. and NOT accustomed to regular vigorous physical activity, please consult a qualified exercise professional (CSEP-CEP) before engaging in maximal effort exercise.

If you answered YES to one or more of the questions above, please GO TO SECTION 2.

Delay becoming more active if:

- You are not feeling well because of a temporary illness such as a cold or fever – wait until you feel better
- You are pregnant – talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the PARmed-X for Pregnancy before becoming more physically active OR
- Your health changes – please answer the questions on Section 2 of this document and/or talk to your doctor or qualified exercise professional (CSEP-CEP or CSEP-CPT) before continuing with any physical activity programme.

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SECTION 2 - CHRONIC MEDICAL CONDITIONS

Please read the questions below carefully and answer each one honestly: check YES or NO.			YES	NO
1.	Do you have Arthritis, Osteoporosis, or Back Problems?		☐ If yes, answer questions 1a-1c	☐ If no, go to question 2
	1a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer NO if you are not currently taking medications or other treatments)	☐	☐
	1b.	Do you have joint problems causing pain, a recent fracture or fracture caused by osteoporosis or cancer, displaced vertebra (e.g., spondylolisthesis), and/ or spondylolysis/pars defect (a crack in the bony ring on the back of the spinal column)?	☐	☐
	1c.	Have you had steroid injections or taken steroid tablets regularly for more than 3 months?	☐	☐
2.	Do you have Cancer of any kind?		☐ If yes, answer questions 2a-2b	☐ If no, go to question 3
	2a.	Does your cancer diagnosis include any of the following types: lung/bronchogenic, multiple myeloma (cancer of plasma cells), head, and neck?	☐	☐
	2b.	Are you currently receiving cancer therapy (such as chemotherapy or radiotherapy)?	☐	☐
3.	Do you have Heart Disease or Cardiovascular Disease? This includes Coronary Artery Disease, High Blood Pressure, Heart Failure, Diagnosed Abnormality of Heart Rhythm		☐ If yes, answer questions 3a-3e	☐ If no, go to question 4
	3a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer NO if you are not currently taking medications or other treatments)	☐	☐
	3b.	Do you have an irregular heart beat that requires medical management? (e.g. atrial fibrillation, premature ventricular contraction)	☐	☐
	3c.	Do you have chronic heart failure?	☐	☐
	3d.	Do you have a resting blood pressure equal to or greater than 160/90 mmHg with or without medication? (Answer YES if you do not know your resting blood pressure)	☐	☐
	3e.	Do you have diagnosed coronary artery (cardiovascular) disease and have not participated in regular physical activity in the last 2 months?	☐	☐
4.	Do you have any Metabolic Conditions? This includes Type 1 Diabetes, Type 2 Diabetes, Pre-Diabetes		☐ If yes, answer questions 4a-4c	☐ If no, go to question 5
	4a.	Is your blood sugar often above 13.0 mmol/L? (Answer YES if you are not sure)	☐	☐
	4b.	Do you have any signs or symptoms of diabetes complications such as heart or vascular disease and/or complications affecting your eyes, kidneys, and the sensation in your toes and feet?	☐	☐
	4c.	Do you have other metabolic conditions (such as thyroid disorders, pregnancy-related diabetes, chronic kidney disease, liver problems)?	☐	☐
5.	Do you have any Mental Health Problems or Learning Difficulties? This includes Alzheimer's, Dementia, Depression, Anxiety Disorder, Eating Disorder, Psychotic Disorder, Intellectual Disability, Down Syndrome)		☐ If yes, answer questions 5a-5b	☐ If no, go to question 6
	5a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer NO if you are not currently taking medications or other treatments)	☐	☐
	5b.	Do you also have back problems affecting nerves or muscles?	☐	☐

Please read the questions below carefully and answer each one honestly: check YES or NO.			YES	NO
6.	Do you have a Respiratory Disease? This includes Chronic Obstructive Pulmonary Disease, Asthma, Pulmonary High Blood Pressure		☐ If yes, answer questions 6a-6d	☐ If no, go to question 7
	6a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer NO if you are not currently taking medications or other treatments)	☐	☐
	6b.	Has your doctor ever said your blood oxygen level is low at rest or during exercise and/or that you require supplemental oxygen therapy?	☐	☐
	6c.	If asthmatic, do you currently have symptoms of chest tightness, wheezing, laboured breathing, consistent cough (more than 2 days/week), or have you used your rescue medication more than twice in the last week?	☐	☐
	6d.	Has your doctor ever said you have high blood pressure in the blood vessels of your lungs?	☐	☐
7.	Do you have a Spinal Cord Injury? This includes Tetraplegia and Paraplegia		☐ If yes, answer questions 7a-7c	☐ If no, go to question 8
	7a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer NO if you are not currently taking medications or other treatments)	☐	☐
	7b.	Do you commonly exhibit low resting blood pressure significant enough to cause dizziness, light-headedness, and/or fainting?	☐	☐
	7c.	Has your physician indicated that you exhibit sudden bouts of high blood pressure (known as Autonomic Dysreflexia)?	☐	☐
8.	Have you had a Stroke? This includes Transient Ischemic Attack (TIA) or Cerebrovascular Event		☐ If yes, answer questions 8a-c	☐ If no, go to question 9
	8a.	Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer NO if you are not currently taking medications or other treatments)	☐	☐
	8b.	Do you have any impairment in walking or mobility?	☐	☐
	8c.	Have you experienced a stroke or impairment in nerves or muscles in the past 6 months?	☐	☐
9.	Do you have any other medical condition not listed above or do you live with two chronic conditions?		☐ If yes, answer questions 9a-c	☐ If no, read the advice on page 4
	9a.	Have you experienced a blackout, fainted, or lost consciousness as a result of a head injury within the last 12 months OR have you had a diagnosed concussion within the last 12 months?	☐	☐
	9b.	Do you have a medical condition that is not listed (such as epilepsy, neurological conditions, kidney problems)?	☐	☐
	9c.	Do you currently live with two chronic conditions?	☐	☐

Please proceed to Page 4 for recommendations for your current medical condition and sign this document.

PAR-Q+

If you answered NO to all of the follow-up questions about your medical condition, you are ready to become more physically active:

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

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

- You should seek further information from a licensed health care professional before becoming more physically active or engaging in a fitness appraisal and/or visit a or qualified exercise professional (CSEP-CEP) for further information.

Delay becoming more active if:

- You are not feeling well because of a temporary illness such as a cold or fever – wait until you feel better
- You are pregnant - talk to your health care practitioner, your physician, a qualified exercise profesional, and/or complete the PARmed-X for Pregnancy before becoming more physically active OR
- Your health changes - please talk to your doctor or qualified exercise professional (CSEP-CEP) before continuing with any physical activity programme.

SECTION 3 - DECLARATION

- You are encouraged to photocopy the PAR-Q+. You must use the entire questionnaire and NO changes are permitted.
- The Canadian Society for Exercise Physiology, the PAR-Q+ Collaboration, and their agents assume no liability for persons who undertake physical activity. If in doubt after completing the questionnaire, consult your doctor prior to physical activity.
- If you are less than the legal age required for consent or require the assent of a care provider, your parent, guardian or care provider must also sign this form.
- Please read and sign the declaration below:

I, the undersigned, have read, understood to my full satisfaction and completed this questionnaire. I acknowledge that this physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if my condition changes. I also acknowledge that a Trustee (such as my employer, community/fitness centre, health care provider, or other designate) may retain a copy of this form for their records. In these instances, the Trustee will be required to adhere to local, national, and international guidelines regarding the storage of personal health information ensuring that they maintain the privacy of the information and do not misuse or wrongfully disclose such information.

NAME _____ DATE _____

SIGNATURE _____ WITNESS _____

SIGNATURE OF PARENT/GUARDIAN/CARE PROVIDER _____

For more information, please contact:
Canadian Society for Exercise Physiology
www.csep.ca

KEY REFERENCES
1. Jamnik VJ, Warburton DER, Makarski J, McKenzie DC, Shephard RJ, Stone J, and Gledhill N. Enhancing the eectiveness of clearance for physical activity participation; background and overall process. APNM 36(S1):S3-S13, 2011.
2. Warburton DER, Gledhill N, Jamnik VK, Bredin SSD, McKenzie DC, Stone J, Charlesworth S, and Shephard RJ. Evidence-based risk assessment and recommendations for physical activity clearance; Consensus Document. APNM 36(S1):S266-s298, 2011.

The PAR-Q+ was created using the evidence-based AGREE process (1) by the PAR-Q+Collaboration chaired by Dr. Darren E. R. Warburton with Dr. Norman Gledhill, Dr. Veronica Jamnik, and Dr. Donald C. McKenzie (2). Production of this document has been made possible through financial contributions from the Public Health Agency of Canada and the BC Ministry of Health Services. The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada or BC Ministry of Health Services.

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Appendix D: CSEP Physician Clearance Form (three pages)

CSEP-PATH: PHYSICIAN PHYSICAL ACTIVITY READINESS CLEARANCE

Dear Physician, _____

Patient Name: _____

Date: _____

Your patient has consulted a Canadian Society for Exercise Physiology - Certified Personal Trainer® (CSEP-CPT) for a physical activity, fitness and lifestyle assessment and/or personal training services.

Although evidence demonstrates that becoming more active is very safe for most people and yields many health benefits, it is important to identify clients who may need a more thorough evaluation before doing a fitness assessment or becoming much more physically active.

During our standardized screening procedures we became aware that your patient:

☐ Answered "Yes" to one or more questions on the Physical Activity Readiness Questionnaire (PAR-Q+) – see copy attached. Specific concern:

_____

☐ Had a Resting Heart Rate of ____ (above the safety cut-off of 99 bpm)

☐ Had a Resting Blood Pressure of ____/____ (above the safety cut-off of 144/94 mmHg)

To ensure that your patient proceeds in the safest way possible, they were advised to consult with you about becoming more physically active. Please complete and sign this form, indicating any necessary physical activity restrictions, and have your patient return the form to their CSEP-CPT.

Based upon my review of the health status of _____ , I recommend:

☐ Unrestricted physical activity based on the *Canadian Physical Activity Guidelines* - start slowly and build up gradually

☐ Progressive physical activity:

- ☐ With avoidance of: _____
- ☐ With inclusion of: _____

☐ Only a medically-supervised exercise program until further medical clearance

☐ No physical activity

Physician Name (please print):

Signed: _____

Date: _____

Physician/Clinic Stamp:

If you have any questions regarding the physical activity, fitness and lifestyle assessment, the PAR-Q+, or the services provided by the CSEP-CPT, please contact:

CSEP-CPT: _____

Email and Phone: _____

NOTE: This Physician Physical Activity Readiness Clearance is valid for a maximum of one year from the date it is completed, and becomes invalid if your patient's medical condition worsens.

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CSEP-CPT Certification and the CSEP-PATH Assessment

The Canadian Society for Exercise Physiology (CSEP) is the Gold Standard for physical activity, health and fitness research and personal training in Canada. Our qualified exercise professionals strive to help Canadians achieve the well-documented health and fitness benefits of regular physical activity in a safe and effective manner. We provide the highest quality specialized and customized physical activity guidance and advice based on scientific evidence and extensive training, building on the foundation of the Canadian Physical Activity Guidelines (CSEP, 2011 - see **http://www.csep.ca/english/view.asp?x=804** for more information).

The CSEP-CPT is certified and sanctioned to administer the assessment, including appropriate submaximal fitness assessment protocols, to apparently healthy individuals, interpret results, develop a client-centred physical activity action plan, and act as a personal trainer (see **http://www.csep.ca/english/view.asp?x=741** for more information). [The CSEP Certified Exercise Physiologist® (CSEP-CEP) is an advanced certification that includes a broader repertoire of clients, and assessment and prescription services.]

CSEP-CPT Certification

To be certified as a CSEP-CPT, candidates must meet the following requirements:

- Academic pre-requisites: A minimum of 2 years of College Diploma or University Degree coursework addressing the CPT core competencies (e.g., Anatomy and Physiology; Psychological Characteristics and Motivational Strategies; Theory and Methods of Health-Related Physical Fitness; Physical Activity/Exercise Prescription and Design; Safety and Emergency Procedures; Documentation, Administration and Professionalism);
- Hold current emergency/standard first aid and CPR Level C;
- Successfully complete 25 hours of in-service training and a national theory and practical exam;
- Participate in continuing education/professional development; and
- Carry annual CSEP membership including mandatory insurance policy ($3M professional and commercial liability).

CSEP-PATH Assessment

The physical activity, fitness and lifestyle assessment administered by the CSEP-CPT is exclusively that outlined in the CSEP Physical Activity Training for Health (CSEP-PATH) resource manual. The assessment provides information to help clients safely and effectively build regular physical activity into their daily lives to improve their health and well-being.

The CSEP-PATH evaluates physical activity, sedentary behaviour and other lifestyle factors (e.g., healthy eating, tobacco and alcohol use) using simple questionnaires. The fitness assessment involves a series of physical tests and measurements. Some of these (e.g., height, body weight, waist circumference) require no physical exertion. Those that evaluate aerobic and musculoskeletal fitness require physical exertion and are briefly outlined below. All clients sign an Informed Consent Form prior to proceeding.

Aerobic Fitness Assessment Measures

Aerobic fitness is estimated based on heart rate response to one of four sub-maximal protocols, depending on the client's interests and capabilities: a multi-stage step test, single-stage treadmill walking, one-mile walk, or a multi-stage cycle test. Post-exercise heart rate and blood pressure are monitored after the respective protocol before proceeding to other measures to ensure an appropriate recovery.

Musculoskeletal Fitness Assessment Measures

Six simple tests are performed to evaluate musculoskeletal fitness: grip strength (strength of hands, forearms); push-up (endurance of chest, shoulders, arms); sit and reach (flexibility of hips); vertical jump (power of legs); back extension (endurance of back); one leg stance (balance and leg strength/endurance).

Physical Activity Prescription

CSEP-PATH assessment results are used to develop a client-centred physical activity action plan, building on the foundation of the Canadian Physical Activity Guidelines (CSEP, 2011), outlined below. The CSEP-CPT employs evidence-based methods to prescribe client-tailored physical activity intensity, duration and frequency. (This does not include maximal effort aerobic physical activity or muscle and bone strengthening exercise.)

Canadian Physical Activity Guidelines

Adults aged 18-64 years should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more. It is also beneficial to add muscle and bone strengthening activities using major muscle groups, at least 2 days per week. More daily physical activity provides greater health benefits.

Adults aged 65 years and older should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more. It is also beneficial to add muscle and bone strengthening activities using major muscle groups, at least 2 days per week. Those with poor mobility should perform physical activities to enhance balance and prevent falls. More daily physical activity provides greater health benefits.

Children aged 5-11 years and youth aged 12-17 years should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily. This should include: vigorous-intensity activities at least 3 days per week; and activities that strengthen muscle and bone at least 3 days per week. More daily physical activity provides greater health benefits.

Appendix E: Participant Consent Form

PARTICIPANT CONSENT FORM

WORKING OUT WITH F.I.D.O. – Frequency, Intensity, Duration, and Outcomes

You are invited to participate in a study entitled Working Out With F.I.D.O. – Frequency, Intensity, Duration, and Outcomes that is being conducted by Clarise Lim.

Clarise Lim is a Master graduate student in the School of Exercise Science, Physical and Health Education at the University of Victoria and you may contact her if you have further questions by email at k9bmed@uvic.ca

As a graduate student, Clarise is required to conduct research as part of the requirements for a degree in Master of Science Kinesiology. It is being conducted under the supervision of Dr. Ryan Rhodes. You may contact the supervisor by email at rhodes@uvic.ca or by phone at 250-721-8384.

Purpose and Objectives

The purpose of this research study is to examine health, psychological, and behavioral outcomes of a randomized controlled trial over a period of 9 weeks total. The study will compare two groups of dog owners through the implementation of an intervention program. One group of dog owners will participate in the intervention for 6 weeks (with a 9 week follow-up). A second group will receive the same program after all data are collected after week 9. The objective of the study is to examine the feasibility and outcomes of a physical activity intervention program involving the application of weekly scheduled group dog walks, the supplementation of educational materials on behavior regulation, and the use of self-monitoring strategies.

Importance of this Research

Research of this type is very important because physical inactivity is a known contributor to morbidities and 85% of Canadian adults are not active enough. It is now a well-established finding that dog owners are more physically active than non-dog owners; however, more than 50% of dog owners are not walking their dogs at all, and 60% of dog owners in Greater Victoria who do walk their dogs are not doing so at the intensities and amounts sufficient enough to reap health benefits. Our research is innovative in that it is the first of its kind to investigate the application of scheduled group dog walks led by a certified fitness instructor, in combination with the use of educational materials on behavior regulation, and the use of self-monitoring strategies as a means to increase

physical activity and reap additional health benefits for dog owners and their canine companions.

Participants Selection

You are being asked to participate in this study because you have met the selection criteria as follows: 1) you are an English speaking adult aged 18 years and above, and live in Greater Victoria. BC; 2) you own a healthy and friendly dog over the age of 6 months; 3) you have completed the Physical Activity Readiness Questionnaire Plus Form and have answered NO to all the questions, or if you have answered YES to any questions, you have obtained medical and physical clearance from your doctor to participate in physical activity using the CSEP Physician Clearance Form; 4) you are currently achieving less than 150 minutes of moderate-to-vigorous intensity physical activity (MVPA) per week, or you are not regularly achieving 150 minutes of MVPA per week and would like to get more out of your current activity levels through dog walking; 5) if your dog is above 7 years old, or has medical issues, your dog has been cleared by his/her veterinarian to participate in moderate-to-vigorous intensity walking lasting between 30 to 60 minutes per session; 6) your dog is spayed/neutered, up-to-date on vaccinations, and has no bite history nor aggression issues towards other dogs or humans.

What is Involved

If you consent to voluntarily participate in this research, your participation will include the following:

1) We ask that you first complete a Physical Activity Readiness Questionnaire Plus Form (PAR-Q+). And where applicable, obtain a written veterinarian clearance for your dog to participate in 30-60 minutes of moderate-vigorous walking if your dog has any health issues or is above 7 years of age. The cost, if any, of obtaining this clearance will be the responsibility of the dog owner. This clearance can be in the form of an email sent directly from the veterinarian clinic to the researcher at k9bmed@uvic.ca

2) To agree to the guidelines of the study, you must sign the last page of this Participant Consent form to indicate consent to participate and to return the following forms to the researcher (a) the signed Participant Consent Form, (b) the completed Screening Form, (c) the signed PAR-Q+ form, and where applicable, (d) the CSEP Physician Clearance Form completed by your doctor and/or (e) a veterinarian note of medical clearance for your dog to participate.

3) You will be randomly assigned to either the intervention group or the waitlist comparison group. The intervention group will receive the program (i.e., instructor-led group dog walks, educational materials, self-monitoring instructions) for 6 weeks with a final week 9 follow-up data collection phase. Participants randomly assigned to the waitlist comparison group will not receive the program for 9 weeks and are asked to go

about their daily routine as they normally would. During this time, both groups will be monitored using pedometers, and online questionnaires.

The waitlist comparison group participants will wait approximately 9 weeks from the start of the study before they receive the program just as the intervention group participants did. The waitlist comparison group participants may choose whether to participate in the program (or not) at the end of week 9, and participation is not mandatory. Data collection will no longer be carried out during this time. If they so wish, intervention group participants are welcome to continue the group walks with the waitlist comparison group participants once data collection is complete.

4) If you are randomly assigned to be in the intervention group, you and your dog will be asked to attend one session of instructor-led group dog walk once a week, for a total of 6 weeks. Each session will last approximately 60 minutes and will include a brief introduction to the session, a basic warm-up, simple workout segments, and cool-down and stretching segments. Though attendance at all 6 walks is not required, we kindly ask and encourage the intervention group participants to attend at least the first 3 group walks. Classes will be held on Sunday evenings 7:00pm at the proposed location of Gorge Waterway. Please arrive early ahead of time to get yourself and your dogs prepared (e.g. washroom visits, ensuring your dog is securely leashed, etc). Alternative locations and times/days may be offered should there be sufficient interest and request from participants.

5) If you are randomly assigned to be in the waitlist comparison group, during the study term of 9 weeks, you will be expected to carry out your daily routine as you normally would. You will not be required to follow any set program set out by the researcher but data collection will still take place using pedometers, step-count log sheets, and online questionnaires during the 3 select monitoring phases.

6) For both groups of participants, you will be asked to wear a pedometer to measure your daily step counts for 3 pre-selected monitoring phases - at baseline (start of study = start of week 1), start of week 6, and start of week 9 (follow-up). Each monitoring phase will consist of 7 days, including weekends. You will wear the accelerometer from 6am to 8pm each of the 7 days, or between when you first awake and go to bed. <u>You will wear the pedometer for 7 days and then complete the questionnaire at the end of the 7th day.</u>

7) We ask that you complete 3 questionnaires online over the 9 weeks study term. Each questionnaire should take no more than 20-30 minutes of your time. Depending on the individual respondent, the first questionnaire may take longer (or not) to complete due to it being the baseline questionnaire. Questionnaire data collection will occur at baseline (end of week 1), end of week 6 (end of program), and end of week 9 (follow-up). The links to the online questionnaires will be emailed to you 3 to 5 days prior to each monitoring phase. You are asked to acknowledge receipt of the questionnaire link by responding to the email. <u>You will complete each questionnaire at the end of the 7th day of wearing the pedometer.</u>

8) You have the right not to answer any questions you do not wish to answer in the questionnaires.

9) Whether you are randomly assigned to the intervention group or have the intention to participate in the group dog walks after 9 weeks as a participant in the waitlist comparison group, your dog must be people and dog-friendly, have no bite history, have basic obedience training and reliably understands/responds to commands such as “sit”, “stay”, “down”, “come”, and “no”.

10) We recommend that you wear clothes and footwear suitable for physical activity, provide your own secure dog leash, dog waste bags, hydration for your dog, and bear the costs, if any, of obtaining veterinary clearance for your dog to participate in the program. No prong or shock collars, or retractable/flexi leashes are allowed during the class for safety reasons. Participants are required to keep their dogs leashed at all times, and dogs must be kept close/next to their owners with no more than 3 feet distance away for optimal control during the walks. No dog treats or food will be allowed during the group dog walk in order to prevent potential resource guarding issues among dogs. Off-leash activity, socialization, playing, and interaction between dogs are strictly prohibited during these walks.

Inconvenience
Participation in this study may cause some inconvenience to you, this includes the time needed to complete the questionnaires and effort in wearing the pedometer daily and recording total step counts daily during the 3 pre-selected monitoring phases (7 days x 3 phases = 21 days total, across 9 weeks) for both intervention and waitlist comparison groups. For the intervention group participants, this also includes travel time to and from attending the group walks and completing simple thinking and writing exercises recommended in the educational and self-regulation materials. If you are randomly assigned to the intervention group, you and your dog will be outdoors during the group dog walks and both of you experience varying weather conditions.

Risks
There are some potential risks to you by participating in this research and they include the potential for injuries, slips or falls when walking outdoors on varied surfaces, such as grass, trails, gravel, wet pavements. There is the possibility of psychological, emotional and physical fatigue especially if you are new to physical activity or progressing the intensity of your dog walks. This could also apply to your dog. In addition, there could be the chance of dog-to-dog conflict or dog-to-human aggression from your dog or from other dogs. The latter would include dogs that are not in the study and are sharing the outdoor public space where the group dog walks are being held.

To prevent or to deal with these risks the following steps will be taken:

1) Participants (for both intervention and waitlist comparison groups) will need to complete a Physical Activity Readiness Questionnaire Plus Form before participating in

the study. A written veterinarian clearance for dogs older than 7 years of age or those with health issues will be needed prior to the start of the study.

2) Should adverse weather conditions ensue or be forecasted, and all residents of Greater Victoria, BC are warned to stay indoors, the scheduled group dog walks will be cancelled and rescheduled for the following week.

3) Participants in the intervention group are advised to dress appropriately for the weather and activity when coming to class, including having proper footwear, bringing water for themselves and their dogs, and dog waste bags.

4) Modifications of walking intensity levels and recovery intervals will be provided to suit individual abilities to ensure that participants and their dogs of varying fitness levels and physical capabilities have options suitable for them to carry out the walks. Should any human participant or dog feel discomfort, show signs of fatigue and/or do not wish to participate further, they may discontinue the session. Participants may also choose to withdraw themselves and their dog from the study at any time without penalty.

5) The certified fitness instructor leading the group dog walk is insured and has many years of leading fitness classes, she is an experienced and responsible dog owner, is (human) first aid and Dogsafe certified, and is qualified in minimizing risks.

6) Dogs participating in the group dog walks are required to be well-socialized to other dogs and humans, and understand and reliably respond to basic commands from his/her owner before being allowed to participate. Dogs must be kept on a secure leash at all times and participants must maintain a reasonably safe distance between their dogs and other dogs while participating in the group walk. Under the discretion of the instructor, participants who repeatedly exhibit an inability or unwillingness to control their dogs for their own or others' safety and/or dogs who exhibit aggression to other dogs or humans may be asked to withdraw from the study altogether.

7) Examples of dog-to-dog or dog-to-human aggression may include barking, growling, lunging, posturing, baring teeth, biting, nipping, etc. While we understand that dogs may exhibit these behaviors if stressed or provoked, for the safety of everyone, the dog owner may be asked to leave the class and withdraw from the program. Should a dog attack and injure a human, 911 and the animal control department will be called to deal with the situation.

Benefits

The potential benefits of your participation in this research include:

<u>To the participants</u>:

Participants and their dog may reap health and well-being benefits from engaging in dog walking together. Dog owners may experience a stronger bond between themselves and their dog. Participants may achieve recommended amounts and intensity of dog walking that will offer not just health but also fitness and psychological benefits. They will be

able to understand how psychosocial and dog-related factors work to motivate and influence their participation in physical activity with their dogs. With this knowledge, they can work towards modifying and improving upon their dog walking behavior in order for themselves to achieve recommended physical activity guidelines regularly and into the long run. As they do so, they will also be concurrently providing sufficient and regular exercise for the benefit and well-being of their dogs.

To the society:

Society may benefit from knowing that canine companionship and dog ownership can lead to better health behaviors among dog owners, and that canine-inclusive physical activity interventions can be applied to help dog owners achieve recommended guidelines of physical activity that are necessary for health benefits and disease prevention. We will be able to use information from our study to inform (1) what influences and motivates dog owners to be regularly physically active with their dogs, especially when faced with set-backs in plans and/or a tight schedule; (2) the feasibility of behavioral regulation and self-monitoring strategies implemented within this study towards increasing physical activity among dog owners in Greater Victoria, BC.

To the state of knowledge:

Even though there have been many studies on dog walking and dog owners' physical activity levels, there have been no research to date studying the application of scheduled group dog walks for dog owners, combined with the use of educational materials and self-monitoring strategies. Hence, this study adds to the current state of knowledge by covering gaps and areas that have not yet been addressed by previous research. With knowledge from this study, initiatives targeting the dog owner population involving group-based dog walking programs together with the use of behavioral regulation strategies may be key to creating sustainable health and physical activity interventions to benefit both dog owners and their dogs.

Compensation

As a way to compensate you for any inconvenience related to your participation, there will be incentives and draw prizes during the study for both groups of participants. These include - and may be subject to change - discounts to canine and/or health related services and products, and draw prizes. Both groups of participants will be entered into each draw that will take place at the end of week 6 and at the end of week 9. If you consent to participate in this study, this form of compensation to you must not be coercive. It is unethical to provide undue compensation or inducements to research participants. If you would not participate if the compensation was not offered, then you should decline to participate. You are welcome to decline these incentives and prizes or, where applicable, redirect the researcher to donate them charitable organizations or canine rescue groups. Terms and conditions of incentives and draw prizes are solely set by the vendors or service providers, which may be subject to change at any time.

Voluntary Participation
Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data collected up to that point will be used for analysis unless you provide clear written instructions to the researcher not to use the data within 7 days of your withdrawal. Compensation, such as draw prizes or incentives, which you may have received up to the point of your withdrawal will not be forfeited. However, your name will not be entered into subsequent draws nor be considered for further incentives upon your withdrawal. You are required to return the pedometer, log sheets, and all supplementary materials you have received up to the point of your withdrawal back to the researcher or research assistant at the Behavioral Medicine Lab within 7 days of your withdrawal.

On-going Consent
To make sure that you continue to consent to participate in this research, a link for each subsequent questionnaire will be emailed to you prior to each monitoring phase. You must click "NEXT" on the last page of the online consent form in that link to imply and provide on-going consent to continue your participation in the study.

Anonymity and Confidentiality
For the intervention group, due to the nature of group activities and the small size of the group, participants and their dogs will not be anonymous to each other nor to the researcher/instructor. We ask that participants in the intervention group keep all information exchanged or received during the study/group walks confidential to maintain the fidelity of the intervention and to respect other participants' privacy. All questionnaires will be tracked for baseline and across-time comparisons and thus will not be anonymous. Names of participants and names of their dog will not be utilized when analyzing data nor will they be mentioned in the final report. Participants will be randomly assigned a number for identification during analysis and only the researcher will have the full list of participant numbers cross-referenced with names. All data from online questionnaires and pedometer log sheets will be digitally downloaded and recorded, and stored in password-protected files. Data from online questionnaires and pedometer log sheets will be stored in the Principal Researcher's computer in the Behavioral Medicine Laboratory located at the University of Victoria for 5 years.

Dissemination of Results
It is anticipated that the results of this study will be shared with others in the following ways: 1) student's thesis; 2) published article(s); 3) class presentations; 4) scholarly meetings and conferences; 5) media release

Disposal of Data
Data from this study will be disposed after 5 years. Digital and electronic data will be deleted and any printed hard copies of data will be shredded.

Contacts
Individuals that may be contacted regarding this study include:
Clarise Lim at k9bmed@uvic.ca and Dr. Ryan Rhodes at rhodes@uvic.ca
In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Your signature below indicates that you understand the above conditions of participation in this study, that you have had the opportunity to have your questions answered by the researchers, and that you consent to participate in this research project.

_____	_____	_____
Name of Participant	*Signature*	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Appendix F: Implied Consent Form

CONSENT FORM - WORKING OUT WITH F.I.D.O. - Frequency, Intensity, Duration, and Outcomes

You are invited to participate in a study entitled Working Out With F.I.D.O. – Frequency, Intensity, Duration, and Outcomes that is being conducted by Clarise Lim. Clarise Lim is a Master graduate student in the School of Exercise Science, Physical and Health Education at the University of Victoria and you may contact her if you have further questions by email at k9bmed@uvic.ca As a graduate student, Clarise is required to conduct research as part of the requirements for a degree in Master of Science Kinesiology. It is being conducted under the supervision of Dr. Ryan Rhodes. You may contact the supervisor by email at rhodes@uvic.ca or by phone at 250-721-8384.

Purpose and Objectives

The purpose of this research study is to examine the health, psychological, and behavioral outcomes of a randomized controlled trial over a period of 9 weeks total. The study will compare two groups of dog owners through the implementation of an intervention program. One group of dog owners will participate in the intervention program for 6 weeks (with a 9 week follow-up). A second group will receive the same program after all data are collected after week 9. The objective of the study is to examine the feasibility and outcomes of a physical activity intervention program involving the application of weekly scheduled group dog walks, the supplementation of educational materials on behavior regulation, and the use of self-monitoring strategies.

Importance of this Research

Research of this type is very important because physical inactivity is a known contributor to morbidities and 85% of Canadian adults are not active enough. It is now a well-established finding that dog owners are more physically active than non-dog owners; however, more than 50% of dog owners are not walking their dogs at all, and 60% of dog owners in Greater Victoria who do walk their dogs are not doing so at the intensities and amounts sufficient enough to reap health benefits. Our research is innovative in that it is the first of its kind to investigate the application of scheduled group dog walks led by a certified fitness instructor, in combination with the use of educational materials on behavior regulation, and the use of self-monitoring strategies as a means to increase physical activity and reap additional health benefits for dog owners and their canine companions.

Participant Selection

You are being asked to participate in this study because you have met the selection criteria as follows: 1) you are an English speaking adult aged 18 years and above, and live in Greater Victoria. BC; 2) you own a healthy and friendly dog over the age of 6 months; 3) you have completed the Physical Activity Readiness Questionnaire Plus Form and have answered NO to all the questions, or if you have answered YES to any questions, you have obtained medical and physical clearance from your doctor to participate in physical activity using the CSEP Physician Clearance Form; 4) you are currently achieving less than 150 minutes of moderate-to-vigorous intensity physical activity (MVPA) per week, or you are not regularly achieving 150 minutes of MVPA per week and would like to get more out of your current activity levels through dog walking; 5) if your dog is above 7 years old, or has medical issues, your dog has been cleared by his/her veterinarian to participate in moderate-to-vigorous intensity walking lasting between 30 to 60 minutes per session; 6) your dog is spayed/neutered, up-to-date on vaccinations, and has no bite history nor aggression issues towards other dogs or humans.

What is Involved?

If you consent to voluntarily participate in this research, your participation will include the following: (1) To complete the following questionnaire that is part of the Working Out with F.I.D.O. study term. (2) There will be a total of 3 online questionnaires for you to complete over the 9-week study term. Questionnaire data collection will occur at 3 pre-selected monitoring phases - baseline, end of week 6, and end of week 9. (3) The first questionnaire would take approximately 30 minutes of your time but this will depend on the individual respondent. Subsequent shorter questionnaires will take between 10 - 20 minutes of your time. The online links to the questionnaires will be emailed to you during each pre-selected monitoring phase. You will complete each questionnaire after each monitoring phase of 7 days. Pedometer data collection will take place at the start of each monitoring phase of 7 days and you will be required to record your total daily step counts onto the pedometer log sheets for each of the 7 days and supplement your pedometer step count tracking with the (optional) CSEP MVPA log provided to you. (4) You have the right not to answer any questions you do not wish to answer in the questionnaires. (5) To agree to the terms of questionnaire completion as part of the study, you must click "NEXT" on the last page of the Consent Form to indicate your consent.

Inconvenience and Risks

Participation in this study may cause some inconvenience to you, this includes: (1) the time needed to complete the questionnaires. A longer time may be needed to answer the first questionnaire which is also the baseline questionnaire; (2) your effort in recalling physical activity information over the last week; (3) your effort in recalling the

behavioral regulation strategies you applied during the week to increase physical activity with your dog. There will be no risk to you in completing the following questionnaire. All 3 questionnaires involved in the study should be completed at your convenience and done so indoors where you have reliable access to the internet, and adequate time to reflect, recall, and respond to the questions without distractions.

Benefits

The potential benefits of your participation completing the questionnaires include:To the participants: Understanding your own physical activity levels, health behaviors, and exercise identity. Gaining insight into psychological processes and psychosocial factors that influence and guide your behaviors. To the society: Information from the questionnaires will help inform society (1) what influences and motivates dog owners to be regularly physically active with their dogs (2) the feasibility of behavioral regulation and self-monitoring strategies implemented within this study towards increasing physical activity among dog owners. We will use the information from our study to develop health and physical activity interventions for the dog owner population.To the state of knowledge: Information from the questionnaires add to the current state of knowledge by covering gaps and areas that have not yet been addressed by previous research. With this knowledge, group-based dog walking programs and initiatives targeting the dog owner population may provide key insight into creating sustainable physical activity interventions to benefit both dog owners and their dogs.

Compensation

As a way to compensate you for any inconvenience related to your participation, there will be incentives and draw prizes during the study for both groups of participants. These include - and may be subject to change - discounts to canine and/or health related services and products, and draw prizes. Both groups of participants will be entered into each draw that will take place at the end of week 6 and at the end of week 9. If you consent to participate in this study, this form of compensation to you must not be coercive. It is unethical to provide undue compensation or inducements to research participants. If you would not participate if the compensation was not offered, then you should decline to participate. You are welcome to decline these incentives and prizes or, where applicable, redirect the researcher to donate them charitable organizations or canine rescue groups. Terms and conditions of incentives and draw prizes are solely set by the vendors or service providers, which may be subject to change at any time.

Voluntary Participation

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation.

If you do withdraw from the study your data collected up to that point will be used for analysis unless you provide clear written instructions to the researcher not to use the data within 7 days of your withdrawal. Compensation, such as draw prizes or incentives, which you may have received up to the point of your withdrawal will not be forfeited. However, your name will not be entered into subsequent draws nor be considered for further incentives upon your withdrawal. You are required to return the pedometer, log sheets, and all supplementary materials you have received up to the point of your withdrawal back to the researcher or research assistant at the Behavioral Medicine Lab within 7 days of your withdrawal.

On-going Consent

To make sure that you continue to consent to participate in this research, a link for each subsequent questionnaire will be emailed to you prior to each monitoring phase. You must click "NEXT" on the last page of the online consent form in that link to imply and provide on-going consent to continue your participation in the study.

Anonymity and Confidentiality

All questionnaires will be tracked for baseline comparisons and thus will not be anonymous. Names of participants and names of their dog will not be utilized when analyzing data nor will they be mentioned in the final report. Participants will be randomly assigned a number for identification during analysis and only the researcher will have the full list of participant numbers cross-referenced with names. All data from online questionnaires and pedometer log sheets will be digitally downloaded and recorded, and stored in password-protected files. Data from online questionnaires and pedometer log sheets will be stored in the Principal Researcher's computer in the Behavioural Medicine Laboratory located at the University of Victoria for 5 years.

Disposal of Data

Data from this study will be disposed after 5 years. Digital and electronic data will be deleted and any printed hard copies of data will be shredded.

Dissemination of Results

It is anticipated that the results of this study will be shared with others in the following ways: 1) student's thesis; 2) published article(s); 3) class presentations; 4) scholarly meetings and conferences; 5) media release

Contacts

Individuals that may be contacted regarding this study include:Clarise Lim at k9bmed@uvic.ca and Dr. Ryan Rhodes at rhodes@uvic.caIn addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Free and Implied Consent

By clicking “NEXT”, completing and submitting the questionnaire, YOUR FREE AND INFORMED CONSENT IS IMPLIED and indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

Appendix G: Benefits of Dog Walking & Skill Building Handout
(M-PAC Constructs – Outcome Expectations and Perceived Capability)

BENEFITS OF DOG WALKING

Behavioural Medicine Laboratory UVic

This educational tool lists the various health benefits of dog walking for you and your dog, especially when the activity of dog walking is maintained over the long run.

Suggestions are also given to help you gradually build up your skills if physically walking your dog is a challenge.

Long-Term Health Benefits of Dog Walking for You and Your Dog

Reduces health risks for heart disease, obesity, diabetes, cancer, depression, etc.	Enhances healthy growth and development
Strengthens the heart & improves fitness	Maintains flexibility of joints & muscles
Maintains & achieves healthy weight	Improves posture and balance
Builds strong bones & strengthens muscles	Prolongs independence as ageing occurs
Aids digestive system and relieves constipation	Reduces/prevents destructive canine behaviors such as digging, unruliness, whining, etc.

Suggestions for Skill Building

Examine whether physically walking with your dog is a challenge.
This can be from physical aspects such as fitness conditioning, injuries, or physical disabilities, or from walking a dog who pulls, walking more than one dog at a time, etc.

- Keep it short and simple, and build up to longer walks.
- Walk at a pace that feels comfortable, and gradually build-up to a higher intensity.
- Be rigorous with leash training around the block, and then slowly expand into other areas you wish to walk.
- Walk with others you can mutually relate to, and especially walk with dogs who get along.

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Appendix H: Making a Physical Activity Plan Worksheet
(M-PAC Construct – Planning)

MAKING A PHYSICAL ACTIVITY PLAN

Behavioural Medicine Laboratory UVic

Sometimes becoming more active with your dog can be challenging. If you feel this way, you are not alone!
One way to make it easier to get started is to make a physical activity plan. This handout will take you through the steps to make your own plan.

Step 1: Think about **WHAT, WHERE, WHEN, HOW**

Read the questions below and write your answers in the spaces provided.
An example answer for each question has been provided.

WHAT type of physical activities do you want to do with your dog?

E.g., More focused walks with my dog	

WHERE would you do these activities with your dog?

E.g., Gorge Park	

WHEN can you be active with your dog?

E.g., Every Sunday evening at 7:00pm	

HOW can you get there with your dog?

E.g., I will drive there	

**Note: Please remember that continuing the planning process is important and this can be done with whatever format you choose such as smart phones, calendars, appointment books.

Step 2: Adding details to your plan
The questions below will help you add more details to your plan.
An example answer for each question has been provided.

(A) How much time will you need for your activity?

E.g., Group walk session = 60 minutes	

(B) Do you need special clothing or equipment?

E.g., Leash, poo bags, dog water bowl, water	

(C) What can you do to prepare for poor weather?

E.g., Rain jacket, dry towel (for dog)	

(D) What are some problems you may run into when carrying out your physical activity plans?

E.g., Getting called into work last minute	

(E) What are some ideas to solve your problems?

E.g., Walk the dog when I get home from work	

Note: Please set a **planning reboot day (e.g., Sunday) where you set up the upcoming week's dog walking plans, and re-consider new strategies if the past week had set-backs that were not overcome. Use this worksheet weekly to make physical activity plans with your dog.

Appendix I: Exercise Identity Formation Worksheet
(M-PAC Construct – Identity)

EXERCISE IDENTITY FORMATION

This self-reflection tool aims to assist you in building a dog walking identity.

Step 1: Brainstorm between 4-6 identities you currently hold. These identities reflect the main roles you take on and the identities you see yourself as having when pursuing your interests or other activities. Some examples would be: "busy mother of four", "breadwinner", "bookworm", "arts & craft specialist", "reality TV junkie", "culinary extraordinaire", "dedicated dog parent", "handyman", "current affairs expert", "couch potato", etc.

Step 2: In the space below, write these identities down and rank them in an hierarchical order. You will rank in priority the identities most important to you as a person and work down to the identities of least importance to you. Please be as honest and realistic with yourself as possible.

Step 3: Decide where dog walking fits within this hierarchy. Then affirm this decision in writing at the bottom of the page that **dog walking will ALWAYS be done before** behaviors associated with the lower-ranked identities. This creates a commitment to dog walking even when some other things have to be sacrificed under time pressures.

Step 4: Brainstorm ways to celebrate and share this new dog walking identity.
This can be through purchasing dog walking related equipment such as a new collar/leash, comfortable walking shoes for dog walking, or taking pictures of you and your dog walking together, and posting these pictures on social media or displaying them in your home. Essentially, create visible reminders of the personal importance of dog walking to you.

Hierarchy of Identities	Ways to Celebrate

I, _____ (full name), affirm that walking with _____ (dog's name) will ALWAYS be done before activities associated with lower-ranked identities.

_____ (signature and date of affirmation)

Appendix J: Building a Dog Walking Routine Worksheet
(M-PAC Constructs – Opportunity and Habit)

BUILDING A DOG WALKING ROUTINE

Behavioural Medicine Laboratory UVic

This instructional tool aims to help you build daily opportunities for walking your dog into the long-term habit of walking your dog regularly. One way to achieve this is to create a ritual routine for dog walking.

Step 1: Think about your current daily routines, then identify a specific routine that could be used as a cue to insert your new dog walking routine.

Step 2: Once you have identified this routine as a cue to walk your dog, use this cue as a reminder to you to walk your dog, and **follow through** with the dog walk right after. **Exposure to this cue should only be associated with dog walking.**

Step 3: In the boxes below, list some routines that **occur once per day** which you can use as cues to walk your dog. Next to each box, describe how each cue would work to remind you to walk your dog. Think of at least two separate routines that can act as cues to you and then put them into action. Some examples have been given to help guide you.

Please utilize cues that you will not easily miss nor get used to. **Your exposure to this specific cue should trigger the association to walk your dog**. *Thus, sticking a note on the fridge to remind yourself to walk the dog **will not work** as you will get used to the note being there all the time, and very quickly you will stop noticing it, rendering the cue ineffective.*

**Note: Individuals' lifestyles and schedules vary, thus you can use one routine/cue to plan for one 30-minute (or longer) walk per day, or you can use two routine/cues to plan for (minimum) two 15-minute walks per day.

Example: Cue	Example: Reminder Strategy
1) After morning breakfast	Breakfast takes place once per day. I can walk my dog for 30 minutes after breakfast.
2) At sunset	Sunset happens once per day. I can walk my dog for at least an hour before it gets dark.

Cue #1	Reminder Strategy
	_____ _____ _____

Cue #2	Reminder Strategy
	_____ _____ _____

Appendix K: Enjoyment Worksheet
(M-PAC Construct – Affective Judgments)

ENJOYMENT

Behavioural Medicine Laboratory UVic

Physical activity provides many health benefits and has also been shown to improve mood, increase energy, reduce stress, prevent depression, and add to overall well-being. This self-reflection and planning tool aims to assist you in recognizing the pleasure that dog walking provides you with, and encourages you to brainstorm ways to make dog walking more enjoyable for both you and your dog.

Step 1: Reflect and write down the reasons why walking with your dog is enjoyable.

Step 2: In the "Locations" box, list some fun or nice places where you would like to walk with your dog, and where you would derive added enjoyment from.

Step 3: In the "Social Experiences" box, list some events or activities where you can walk with your dog, and where both of you can benefit from the social opportunities involved.

Step 4: In the "Others" box, list other considerations/features you would incorporate or are important to you, and which you think would make dog walking more enjoyable for you.

Step 5: Incorporate these ideas and strategies into your plans for dog walking over the next week.

REASONS	LOCATIONS

SOCIAL EXPERIENCES	OTHERS

CANADIAN PSYCHOLOGICAL ASSOCIATION / SOCIÉTÉ CANADIENNE DE PSYCHOLOGIE

Public Health Agency of Canada / Agence de santé publique du Canada

Appendix L: Self-Report Physical Activity & Dog Walking Questions

LEISURE TIME PHYSICAL ACTIVITY WITHOUT YOUR DOG QUESTIONS

This section will ask you about your leisure time physical activity intensity, frequency, and duration done WITHOUT YOUR DOG. For the following questions, we would like you to recall your average weekly leisure time physical activity you participated in WITHOUT YOUR DOG over the past week. Specifically on average, how many times per week did you engage in physical activity for leisure without your dog over the past week and what the average duration of each session was. When answering these questions, please: (1) count only physical activity that was done during free time (not occupation) without your dog (2) note that the main difference between the three categories is the intensity of the leisure time physical activity (3) write the average frequency (times) on the first line and the average duration (minutes) on the second line

Strenuous intensity physical activity

Heart beats rapidly, sweating (from increased effort), as fast as you could walk, or jogging

Times per week ☐

Average minutes per session ☐

Moderate intensity physical activity

Not exhausting, light perspiration (from increased effort), a good brisk pace

Times per week ☐

Average minutes per session ☐

Mild intensity physical activity

Minimal effort, no perspiration, a casual walk

Times per week ☐

Average minutes per session ☐

LEISURE TIME PHYSICAL ACTIVITY WITH YOUR DOG QUESTIONS

This section will ask you about your leisure time physical activity intensity, frequency, and duration done WITH YOUR DOG. For the following questions, we would like you to recall your average weekly leisure time physical activity you participated in WITH YOUR DOG over the past week. Specifically on average, how many times per week did you engage in physical activity for leisure with your dog over the past week and what the average duration of each session was. When answering these questions, please: (1) count only physical activity that was done during free time (not occupation) with your dog (2) note that the main difference between the three categories is the intensity of the leisure time physical activity done with your dog (3) write the average frequency (times) on the first line and the average duration (minutes) on the second line

Strenuous intensity physical activity (done with your dog)

Heart beats rapidly, sweating (from increased effort), as fast as you could walk, or jogging

Times per week ☐

Average minutes per session ☐

Moderate intensity physical activity (done with your dog)

Not exhausting, light perspiration (from increased effort), a good brisk pace

Times per week ☐

Average minutes per session ☐

Mild intensity physical activity (done with your dog)

Minimal effort, no perspiration, a casual walk

Times per week ☐

Average minutes per session ☐

LEISURE TIME DOG WALKING ACTIVITY QUESTIONS

This section will ask you questions about your dog walking activity only. For the following questions, we would like you to recall your average weekly dog walking over

the past week. Specifically on average, how many times per week did you walk WITH YOUR DOG over the past week and what the average duration of each walk was. When answering these questions, please: (1) count only dog walking you participated in with your dog that was done during free time (not occupation) (2) note that the main difference between the three categories is the intensity of the dog walking activity (3) write the average frequency (times) on the first line and the average duration (minutes) on the second line

Strenuous intensity dog walking
Heart beats rapidly, sweating (from increased effort), as fast as you could walk, or jogging

Times per week ☐

Average minutes per walk ☐

Moderate intensity dog walking
Not exhausting, light perspiration (from increased effort), a good brisk pace

Times per week ☐

Average minutes per walk ☐

Mild intensity dog walking
Minimal effort, no perspiration, a casual walk

Times per week ☐

Average minutes per walk ☐

Appendix M: Multi-Process Action Control (M-PAC) Questions

DOG WALKING BEHAVIOR QUESTIONS

This part of the survey will ask you questions related to your dog walking behavior, intention, attitudes, and perceptions.

INTENTION

Please fill in the blanks. Over the next week, I intend to walk my dog _____ times per week.

Number of times over the next week ☐

PLANNING AND SCHEDULING

The following questions ask you about the strategies you used to engage in regular dog walking over the past week. Please select ONE answer that best applies for each of the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) I kept track of my dog walking in an exercise diary or log over the past week (i.e., personal exercise diary / log)	○	○	○	○	○
(2) I kept track of my dog walking in an exercise diary or log over the past week (i.e., study-related log sheets)	○	○	○	○	○
(3) I set short-term (daily or weekly) goals for dog walking over the past week	○	○	○	○	○
(4) I made detailed plans regarding what I would do if something interfered with my plans to engage in dog walking over the past week	○	○	○	○	○

(5) I reserved time in my daily schedule for regular dog walking over the past week	○	○	○	○	○
(6) I made plans concerning "when", "where", "what" and "how" I was going to engage in regular dog walking over the past week	○	○	○	○	○

CAPABILITY

Please select ONE answer that best applies for each of the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) I am physically able to walk my dog regularly if I wanted to	○	○	○	○	○
(2) I am capable to walk my dog regularly if I wanted to	○	○	○	○	○

OPPORTUNITY

Please select ONE answer that best applies for each of the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) I have the opportunity to walk my dog regularly if I wanted to	○	○	○	○	○
(2) I have enough free time in my schedule to walk my dog regularly if I wanted to do so	○	○	○	○	○

RESPONSIBILITY

Please select ONE answer that best applies for each of the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) I feel pressure from my dog to walk him / her	○	○	○	○	○
(2) I feel an obligation to walk my dog regularly	○	○	○	○	○
(3) I feel a responsibility to walk my dog regularly	○	○	○	○	○

IDENTITY

Please select ONE answer that best applies for each of the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) I consider myself someone who is physically active with my dog	○	○	○	○	○
(2) When I describe myself to others, I usually include my involvement in physical activity with my dog	○	○	○	○	○
(3) I have numerous goals related to being physically active with my dog	○	○	○	○	○
(4) Being physically active with my dog is a central factor to my self-concept	○	○	○	○	○
(5) I need to be physically active with my dog to feel good about myself	○	○	○	○	○
(6) Others see me as someone who is physically active with their dog	○	○	○	○	○
(7) For me, being physically active with my dog means more	○	○	○	○	○

than just exercising					
(8) I would feel a real loss if I were forced to give up being physically active with my dog	○	○	○	○	○
(9) Being physically active with my dog is something I think about often	○	○	○	○	○

HABIT

Please select ONE answer that best applies for each of the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) I engage in dog walking automatically (e.g., without intending to do it)	○	○	○	○	○
(2) I engage in dog walking without having to consciously remember it	○	○	○	○	○
(3) I engage in dog walking without consciously thinking about it	○	○	○	○	○
(4) I start dog walking before I realize I am doing it	○	○	○	○	○

OUTCOME EXPECTATIONS

Please select ONE answer that best applies to you for each of the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) I walk my dog to maintain / improve my health	○	○	○	○	○
(2) Walking my dog is good for my well-being	○	○	○	○	○
(3) Walking my dog provides me with social	○	○	○	○	○

advantages					
(4) Walking my dog makes him / her behave better	○	○	○	○	○
(5) Walking my dog is good for his / her well-being	○	○	○	○	○
(6) Walking my dog keeps my dog healthy	○	○	○	○	○

AFFECTIVE JUDGMENTS

Please select ONE answer that best applies to you for each of the following statements.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) I walk my dog because it's fun	○	○	○	○	○
(2) I enjoy my dog walking sessions	○	○	○	○	○
(3) I find dog walking a pleasurable activity	○	○	○	○	○
(4) I find dog walking a satisfying activity	○	○	○	○	○

Appendix N: Program Evaluation Questions (Experimental Group)

PROGRAM EVALUATION QUESTIONS

This section will ask you for your feedback about the program you have participated in. Your feedback is valuable to the researchers and will contribute to the design and delivery of future interventions.

Question 1 - PARTICIPATION

I participated in this program / study because ...

Question 2

What was your favorite aspect of the program and why?

My favorite aspect of the program and why

Question 3

What was your least favorite aspect of the program and why?

My least favorite aspect of the program and why

Question 4

If you were to describe this program to a friend or family member, what 3 words best capture your experience?

(1)

(2)

(3)

Question 5

If you were in charge of designing this program in the future, what 3 aspects of the program would you recommend be kept, and what 3 aspects would you recommend be

changed (e.g., frequency, duration, location, number of participants, content etc.), and why?

Aspects to be kept and why	
Aspects to be changed and why	

Question 6 - OVERALL SATISFACTION

This section will ask you to rate your overall satisfaction with regards to the program. Please select one answer for each statement.

	Very dissatisfied (1)	Dissatisfied (2)	Neutral (3)	Satisfied (4)	Very satisfied (5)
(1) The use of the pedometer device	○	○	○	○	○
(2) Worksheets & supplementary materials	○	○	○	○	○
(3) Number of group walks (i.e., 6 walks)	○	○	○	○	○
(4) Length of each group walk session (60-75 mins)	○	○	○	○	○
(5) Location and routes of the group walk	○	○	○	○	○
(6) Time and day of the group walks	○	○	○	○	○
(7) Methods of communication and information dissemination	○	○	○	○	○
(8) The facilitator / instructor	○	○	○	○	○
(9) Participation incentives and draw prizes	○	○	○	○	○

(10) Troubleshooting issues & resolutions provided	○	○	○	○	○
(11) Pick-up / drop-off of pedometers, study materials, etc.	○	○	○	○	○

Question 7

Based on your responses given above, please provide additional feedback which you think might be useful to the researchers to help them understand your responses.

Question 8 - PROGRAM COMPONENTS AND EFFECTIVENESS

This section will ask you about the group walk component and the use of the pedometer device as an objective measure of data collection. Please select one answer for each statement.Please note: "study objectives" = increase weekly dog walking, physical activity, and intensity

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) The group walks were useful in helping me meet the study objectives	○	○	○	○	○
(2) I enjoyed attending the group walks	○	○	○	○	○
(3) I would recommend the group walks to other dog owners	○	○	○	○	○
(4) The pedometer device was easy to use	○	○	○	○	○
(5) Wearing the pedometer was useful in helping me meet the study objectives	○	○	○	○	○
(6) Tracking my daily step counts on the log sheets provided was useful in helping	○	○	○	○	○

me meet the study objectives					
(7) I would recommend the use of pedometer devices to other dog owners	○	○	○	○	○
(8) I would recommend tracking daily step counts on log sheets to other dog owners	○	○	○	○	○
(9) The program helped increase my motivation to make positive changes in my dog walking and physical activity behavior	○	○	○	○	○
(10) The program resulted in positive changes in my physical activity and dog walking behavior	○	○	○	○	○

Question 9

Based on your responses given above, please provide additional feedback which you think might be useful to the researchers to help them understand your responses.

Question 10 - WORKSHEET CONTENT & EFFECTIVENESS

This question will ask you about the individual worksheets you received during the study and their contents.

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) The contents of the PLANNING worksheet provided new information / strategies and were useful to me	○	○	○	○	○
(2) I utilized the PLANNING worksheet regularly to make dog walking plans	○	○	○	○	○
(3) I would recommend the	○	○	○	○	○

PLANNING worksheet to other dog owners					
(4) The contents of the EXERCISE IDENTITY worksheet provided new information / strategies and were useful to me	○	○	○	○	○
(5) I utilized the EXERCISE IDENTITY worksheet and reaffirmed my dog walking identity regularly	○	○	○	○	○
(6) I would recommend the EXERCISE IDENTITY worksheet to other dog owners	○	○	○	○	○
(7) The contents of the OPPORTUNITY & HABIT (cueing) worksheet provided new information / strategies and were useful to me	○	○	○	○	○
(8) I utilized the OPPORTUNITY & HABIT (cueing) worksheet regularly when making dog walking plans	○	○	○	○	○
(9) I would recommend the OPPORTUNITY & HABIT (cueing) worksheet to other dog owners	○	○	○	○	○
(10) The contents of the ENJOYMENT worksheet provided new information / strategies and were useful to me	○	○	○	○	○
(11) I utilized the ENJOYMENT worksheet regularly when making dog walking plans	○	○	○	○	○
(12) I would recommend the ENJOYMENT worksheet to other dog owners	○	○	○	○	○

Question 11
Based on your responses given above, please provide additional feedback on the worksheets which you think might be useful to the researchers to help them understand your responses.

Question 12
As a result of participating in the study,

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
(1) I am now walking more with my dog per week	○	○	○	○	○
(2) I am now more physically active with my dog per week	○	○	○	○	○
(3) I am now more physically active overall per week	○	○	○	○	○
(4) I am now more aware of the different intensity levels involved in the physical activities I engage in	○	○	○	○	○
(5) I now would like more weekly scheduled group dog walks led by an instructor	○	○	○	○	○

Question 13 - ATTENDANCE
If you have missed any of the 6 group walks during the study, please kindly provide us with helpful insight as to why the sessions were missed.

Question 14 - PROGRAM DELIVERY
Compared with in-person scheduled group dog walks led by an instructor, would an internet-based (online) or telephone-based program be more effective and/or preferred?

And why? Please kindly provide your feedback and supporting rationale in the box below.

Question 15 - PARTICIPATION INCENTIVES

Were you able to utilize any of the participation incentives offered? If yes, which ones? If no, please specify why not.

Question 16 - ADDITIONAL FEEDBACK

Please provide any other additional feedback on the program and/or study that you think would be helpful to the researchers.