Veterinarians’ Perceptions of and Experiences with Counselling about Dog Walking

by

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ABSTRACT

VETERINARIANS’ PERCEPTIONS OF AND EXPERIENCES WITH COUNSELLING ABOUT DOG WALKING

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This study used interviews guided by a behaviour change theory, Integrated Model of Behavioral Prediction, to understand veterinarians’ perceptions of and experiences with dog-walking counselling. Seventeen practicing veterinarians providing care to dogs in Ontario were recruited.

Qualitative analysis identified themes relating to participants’ (a) approaches to discussing dog walking with owners, (b) perceived benefits of dog walking, (c) perceptions of other veterinarians’ dog-walking counselling, (e) perceptions of dog owners’ expectations regarding dog-walking counselling, (f) perceived barriers to dog walking, (g) levels of confidence regarding dog-walking counselling, and (h) dog-walking knowledge.

The results suggest that dog-walking counselling may be improved if veterinarians identify and reduce the barriers they face when discussing dog walking with dog owners, increase their awareness of dog-walking benefits, and increase owners’ expectations of this counselling. Improved promotion and discussions of dog walking by veterinarians may positively influence dog walking, benefiting the health of the dog and owner.
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Chapter 1.0 Introduction

1.1 Health Benefits of Physical Activity

Physical activity is an essential component to living a healthy lifestyle. Physical activity not only improves physical fitness but also helps prevent and delay undesired health outcomes (US Department of Health and Human Services [USDHHS], 2008a) and reduces the risk of many chronic diseases (Public Health Agency of Canada [PHAC], 2011). These benefits can be observed in individuals of all health statuses, in both males and females and among all ages (USDHHS, 2008a).

Physical activity is vital in the prevention of chronic disease (USDHHS, 1996) because it helps reduce the risk of cardiovascular disease, stroke, metabolic syndrome, osteoporosis, premature death, (USDHHS, 2008a) and some types of cancer (i.e., breast and colon cancer) (PHAC, 2011). Physical activity can help to prevent various diseases by reducing their respective risk factors which include obesity, high blood pressure, high blood cholesterol and high triglyceride levels (USDHHS, 2008a). A review of the longitudinal research in healthy populations has shown that being physically active is negatively related to other chronic diseases including coronary heart disease and type 2 diabetes. Along with regular weight-resistance activities, participation in regular physical activity has been shown to slow the progression of age-related reduced bone density and helps maintain muscle mass and improve muscle function (USDHHS, 2008a).

Additional benefits of physical activity regarding mental function and mental health have been observed. Improvements in overall mental health, specifically in cognitive function and reduction in depression, have been observed in physically active individuals (USDHHS, 2008a). Research suggests a negative relationship between physical activity and Alzheimer’s disease and
dementia (Abbott et al., 2004; Chang et al., 2010; Larson et al., 2006; Laurin, Verreault, Linday, MacPerson, & Rockwood, 2001; Podewils et al., 2005; Rovio et al., 2005).

Physical activity and weight resistance activities are important in the maintenance of good physical and mental health. Specifically, these activities are critical in reducing and preventing disease by reducing the related risk factors associated with disease. Physical activity and weight resistance activities are therefore recommended as part of a healthy lifestyle for children and adults of all ages (CSEP, 2014).

1.2 Physical Activity Recommendations

Both Canada and the United States (US) have guidelines for physical activity and sedentary behaviour to help the population become more active. The physical activity guidelines from the Canadian Society for Exercise Physiology (CSEP) are used in Canada whereas the Physical Activity Guidelines for Americans (PAGA), which are similar to the CSEP recommendations, are used in the US.

According to the CSEP guidelines, in order to experience the health benefits of physical activity, it is recommended that adults accrue a minimum of 150 minutes of moderate to vigorous aerobic activity in bouts of at least 10 minutes throughout the week (CSEP, 2014). Similar to the Canadian guidelines, the PAGA also suggests that adults accumulate 150 minutes of moderate-intensity physical activity. Their recommendation also includes an alternative of 75 minutes of vigorous-intensity aerobic physical activity or a combination of both intensities to meet recommendations (USDHHS, 2008b). As with the CSEP guidelines, the PAGA recommends that aerobic activity be in minimum bouts of 10 minutes and that activity is spread evenly throughout the week (USDHHS, 2008b). Both guidelines also include recommendations regarding muscle- and bone- strengthening activities which include using major muscle groups at
least 2 days of the week (CSEP, 2014; USDHHS, 2008b). The PAGA specifically recommends that adults participate in a minimum of 2 days of moderate- to vigorous-intensity muscle strengthening activities (USDHHS, 2008b).

These very specific guidelines have been thoroughly researched and have been recommended to Canadian and American adults. They are designed to promote adequate amounts of aerobic and muscle strengthening activity to prevent disease and reduce the onset their associated risk factors.

Research suggests that sufficient activity may be achieved by accumulating at least 10,000 steps per day, in recommended 10 minutes bouts, as outlined in the CSEP and PAGA guidelines (Le Masurier, Sidman, & Corbin, 2003). Tudor-Locke and Basset reviewed the literature and projected step recommendations for healthy adults in 2004. The number of steps required to be active is greater than 10,000-12,499 steps per day (Tudor-Locke & Basset, 2004). The recommended 10,000 steps per day were derived from this research. However, more recent research suggests that 7,000-8,000 steps/day is also an adequate step accumulation for adults as this incorporates the threshold for free-living activity as well as the minimum amount of moderate to vigorous physical activity (Tudor-Locke et al., 2011). The lower 7,000 step value is based on 2005-2006 National Health and Nutrition Examination Survey (NHANES) accelerometer data which indicated that accumulating 150 minutes/week of moderate to vigorous physical activity is associated with achieving approximately 7,000 steps/day (Tudor-Locke et al., 2011). The upper 8,000 step value is based on the minimum free-living activity of 5,000 steps/day, which is indicative of a sedentary lifestyle. The minimum 3,000 steps of moderate-vigorous physical activity is derived from 30 minutes of moderate activity at a rate of ≥100 steps per minute with minimum bouts of 10 minutes (Tudor-Locke et al., 2011). Normative data from
a review of the literature suggests that healthy adults can take anywhere from 4,000-18,000 steps/day, therefore the recommended 10,000 steps/day remains a reasonable target for adults (Tudor-Locke et al., 2011). It is important for the public to be aware this steps/day is a guideline and achieving more steps is associated with greater health benefits (Tudor-Locke et al., 2011).

1.3 Prevalence of Physical Activity in the Canadian Population

Data collected from the accelerometer results of the 2007-2009 Canadian Health Measures Survey (CHMS) suggest that Canadian adults are not meeting physical activity recommendations. As an alternative to self-report physical activity measures, the CHMS gathered objective data using accelerometers from a nationally representative sample of Canadians to determine whether physical activity guidelines were being met (Colley, Garriguet, Janssen, Craig, Clarke & Tremblay, 2011). According to the CHMS results, only 15% of the Canadian adult population were meeting the physical activity recommendations. A larger percentage of men (17%) than women (14%) were meeting the recommendations (Colley et al., 2011). Only 5% of the Canadian adult population accumulated 150 minutes of physical activity on a regular basis which is equivalent to 30 minutes on at least 5 days of the week (Colley et al., 2011). Slightly more than half of the adult Canadian population (53%) accumulated 30 minutes of moderate-vigorous physical activity at least 1 day of the week and 47% of the population accumulated 30 minutes of moderate-vigorous physical activity less than 1 day per week (Colley et al., 2011).

Using steps to assess physical activity, the majority of men and women were not meeting the recommended 10,000 steps per day, with only 35% of adults meeting the recommendation. Men averaged 9,500 steps per day compared to women who averaged 8,400 steps (Colley et al., 2011).
Dissimilar physical activity levels were observed among different age groups of adults and among normal weight and obese adults. The CHMS results indicated that younger adults were more active compared to older adults, as 19% of adults aged 18-39 met the moderate-vigorous physical activity recommendations compared to only 11% of older adults aged 60-79 (Statistics Canada, 2013). Older adults were significantly less likely to reach the recommended 10,000 steps per day compared to people 20-39 years of age (Colley et al., 2011). Older men and women accumulated an average of 7,900 and 7,000 steps, respectively (Colley et al., 2011). Men and women classified as normal weight accumulated more daily moderate-vigorous physical activity compared to their obese peers. Men and women of normal weight accumulated 34 and 23 minutes of daily moderate-vigorous physical activity respectively, compared to obese men and women who obtained 19 and 13 minutes, respectively (Statistics Canada, 2013).

As demonstrated by this research, Canadians are not meeting the physical activity guidelines recommended by Health Canada. This is a concern as many Canadians may be at higher risk of chronic disease because of their low activity levels.

1.4 Walking as Physical Activity

Walking is a very convenient and comfortable method of increasing physical activity. Walking is accessible as it requires no equipment or facilities, is easy, and is inexpensive (Epping, 2011). Walking can be adapted to all fitness levels and is a safe and effective form of aerobic exercise for those who are sedentary (Hootman et al., 2001). Health benefits have been observed in those engaging in different intensities of walking. For instance, research in older adults concludes that good health and function in older adults is associated with high amounts of low-intensity walking (Varma et al., 2014). Brisk walking is classified as a moderate-vigorous physical activity, which is the intensity recommended by CSEP and PAGA. A recent study
suggested that the rate of self-paced brisk walking is closely related to the moderate physical activity (Pillay, Kolbe-Alexander, Proper, van Mechelen & Lambert, 2014; USDHHS, 2008a). This suggests that the moderate intensity and the health benefits associated with the physical activity recommendations may be met by brisk walking.

1.5 Dog walking as Physical Activity

There is a strong relationship between the ownership of a dog and the maintenance of a physically active lifestyle (Ružić, Miletić, Ružić, Peršić & Laškarin, 2011). Dog owners are more physically active and walk significantly more compared to non-dog owners (Brown & Rhodes, 2006) and the dog may act as a mediator in the relationship of owning a dog and regular physical activity (Yabroff, Troiano, & Berrigan, 2008). The America Heart Association stated that dog ownership is likely associated with a decreased risk of cardiovascular disease and that the association may be causal (Levine et al., 2013). Degeling and Rock (2012) found that looking after a dog prompted increases in physical activity among non-dog owners, which suggests that simply caring for a dog can initiate increases in physical activity in humans.

According to Johnson and Meadows (2010), social support is considered a strong predictor of motivation for participation in physical activity. The social support associated with owning a dog provides the potential to increase physical activity levels through dog walking (Ham & Epping, 2006). This type of social support can serve as motivation for dog owners to walk their pets as dogs require exercise and can be an exercise partner for their owner (Ham & Epping, 2006). Dog owners often view their pet as motivation and as a companion to walk (Cutt, Giles-Corti, Wood, Knuiman, & Burke, 2008; Knights & Edwards, 2008). Johnson and Meadows (2010) suggest that the social support that dogs provide can increase readiness, long-term commitment and adherence to physical activity. Commitment to their pet may also help
explain healthier physical activity patterns among their owners, as it usually involves taking the
dog for a walk (Johnson & Meadows, 2010).

Dog walking has been associated with commencement and maintenance of physical activity and has been observed to assist individuals in meeting the recommendations for aerobic activity (Ham & Epping, 2006). Research has shown dog owners to be more active than non-dog owners, however approximately 50% of dog owners are not physically active with their pets (Ham & Epping, 2006) and approximately one third of dog owners do not walk their dogs regularly (Cutt, Giles-Corti & Knuiman, 2008; Hoerster et al., 2011). This presents an opportunity for a physical activity intervention among dog owners (Ham & Epping, 2006).

Rhodes et al., (2012) implemented a dog-walking physical activity intervention which involved the distribution of a package containing promotional dog walking materials among dog owners who did not regularly walk their dog. This study suggested that dog walking may be a way to increase activity among irregular dog walkers, as dog owners in the intervention group reported significantly higher step counts compared to the control group (Rhodes et al., 2012). A study by Schneider et al., (2014), suggests that a dog walking intervention can increase physical activity among dog owners. Dog owners were randomized to either an intervention condition or a control condition. In the experimental condition, participants were involved in a six-month program, involving a social network, specifically a Meetup™ group, that focused on increasing dog walking through neighbourhood walks, community events, newsletters and an activity monitor. Meetup™ is an online network used to schedule events in a community targeted toward specific interests (Schneider et al., 2014). In the control condition, participants received a monthly email for the six-month period that encouraged them to walk. The participants in the experimental condition significantly increased the number of steps they took from baseline to the
end of the six-month period, suggesting that interventions involving dog walking may increase walking among owners (Schneider et al., 2014).

With the activity of dog walking, there is an opportunity to create purposeful physical activity interventions that people may adhere to long-term. Individuals are more likely to adhere to an aerobic exercise regimen when they consider it to be purposeful. With dogs living in 33% of Canadian households (Perrin, 2009), targeting dog owners may be an effective and feasible approach to increasing aerobic physical activity (Morgan, 2001).

### 1.6 Physical Activity for Dogs

Daily dog walking is important for dogs’ overall general health (American Society for the Prevention of Cruelty to Animals [ASPCA], 2011). Exercise burns calories and maintains a high level of general good health. Physical activity is important in dogs as obesity was found to be associated with lower levels of vigorous activity as a study by Morrison, Penpraze, Beber, Reilley, and Yam (2013) suggests. Regular exercise can also benefit dogs socially, mentally and emotionally, preventing boredom and potentially destructive behaviour (ASPCA, 2011). The amount that a dog is walked is negatively associated with certain problem behaviours including fear of strangers, noises and stimuli, lack of obedience (Tami, Barone & Diverio, 2008) aggressive behaviour, pulling on the leash (Podberscek & Serpell, 1997) and excessive barking, activity or escaping (Kobelt, Hemsworth, Barnett, & Coleman, 2003). Some other benefits of exercise and play include reducing digestive problems and promoting drowsiness and relaxation in the evenings (ASPCA, n.d). A dog’s exercise needs vary by the breed, size, age and individual characteristics, however most greatly benefit from daily forms of aerobic exercise such as walking for half an hour each day (ASPCA, n.d.). To support a dog’s need for regular exercise, the Canadian Veterinary Medical Association recommends that they be taken for a
walk 2-3 times per day (The Canadian Veterinary Association, n.d.). This recommendation is supported by results from a recent study which suggests that 30 minutes of daily activity can positively influence a dog’s weight or body condition score even among inactive dogs over a short-term period (3 months) (Byers et al., 2014).

1.7 Obesity in Dogs

Canine obesity is classified as 15-20% above their ideal weight (Bland, Guthrie-Jones, & Hill, 2010). Dogs face similar consequences of having an unhealthy body weight as humans (Association for Pet Obesity Prevention, 2010) and similar to their owners, they benefit significantly from exercise (ASPCA, n.d.). It has been suggested that dogs are facing a similar obesity epidemic as humans with an estimated 53% of dogs classified as overweight or obese in the US (Association for Pet Obesity Prevention, 2010). The similar patterns of increasing incidence of overweight and obesity in pets and owners presents an opportunity to increase physical activity levels and promote healthy weights within both groups (Byers et al., 2014). Three specific factors contributing to canine obesity are genetic predisposition, reproductive management, and dietary or exercise (human) management (Bland, Guthrie-Jones, & Hill, 2009). Obesity in companion dogs from dietary, exercise or human management reflects the human-animal interrelationship, as the owner has control over the feeding and exercise patterns of the dog (Bland et al., 2009). This type of obesity is caused by an excess intake of required energy and/or inadequate exercise and emphasizes the role that the owner has on the dog’s health, and therefore the human-animal bond is important when establishing a treatment for overweight dogs (Bland et al., 2009). A study by Bland et al. (2009) suggests that owners’ care practices influence obesity risk factors in dogs. Specifically, owners of normal weight dogs fed their pets less dog treats, reported engaging their dog in more exercise, and fed their dog in 2 daily portions.
compared to owners of obese dogs (the owners of obese dogs were more likely to feed their dog treats more frequently and fed their dog in either 1, or 3 or more daily portions compared to owners of normal weight dogs) (Bland et al., 2009). In an Australian study, McGreevy et al. (2005) found that rural and semi-rural dogs were more at risk of overweight compared to urban dogs. They speculated that there may be more readily available food for rural dogs especially if they are on farms or that rural animals are perceived to get more exercise on their own and therefore are engaged in less structured exercise than their urban counterparts (McGreevy et al., 2005.)

ASPCA (n.d.) suggests that dogs may benefit from daily aerobic exercise and a daily walk. Humans can prevent obesity and manage their pet’s weight by taking their dog for regular daily walks and it is one way to address the exercise and human factor contributing to canine obesity.

1.8 Adults as a Target for Dog-Walking Physical Activity Interventions

The literature suggests that a higher prevalence of adults compared to children walk their dog, which reinforces adult dog owners as a target population for dog-walking physical activity interventions (Christian et al., 2013; Cutt, Giles-Corti, Knuiman, Timperio, & Bull 2008). Adults are typically the dog owners and research from New Zealand suggests that most dog owners are between 18 and 55 years of age (Flint, Minot, Perry, & Stafford, 2010). A Canadian study involving dog owners who did not regularly walk their dog suggests that middle-aged dog owners, compared to other age groups, may be more interested in dog-walking physical activity interventions (Rhodes, Murray, Temple, Tuokko & Higgens, 2012). Therefore, it is the author’s view that adult owners of dogs will be those most likely to attend veterinarian appointments and therefore be involved in dog walking discussions and interventions.
1.9 Physical Activity among dog owners versus non-dog owners

Overall, Christian et al. (2013) observed that dog owners were more physically active and walked more compared to non-dog owners. Their review of the literature from 1990-2010 indicated that dog owners reported more minutes of physical activity than non-dog owners, with a median of 329 minutes per week for dog owners and 277 minutes per week for non-dog owners (Christian et al., 2013). Additionally, dog owners reported more walking minutes per week compared to non-dog owners, with median weekly minutes of 129 minutes for dog owners and 111 minutes for non-dog owners (Christian et al., 2013). In 4 of the 14 studies in the review by Christian et al. (2013), physical activity was measured objectively by an accelerometer or pedometer. Similar patterns of activity were observed in these studies using accelerometers or pedometers, compared to the 10 other studies, as dog owners had significantly higher levels of physical activity compared to non-dog owners (Christian et al., 2013). Schofield, Mummery, and Steele (2005) found that dog walking was associated with meeting the physical activity guidelines. Also, Oka and Shibata (2012) concluded that dog walkers were 34% more likely to achieve the 150 minutes of leisure-time physical activity. Feng et al., (2014) found that among a sample of older adults, dog-owners were 27% more active and walked 12% more compared to non-dog owners.

1.10 Physical activity among dog walkers versus non-dog walkers

Compared to non-dog walkers, dog walkers were found to walk more, be more active and therefore were more likely to meet the physical activity recommendations (Christian, Giles-Corti, & Knuiman 2010). In a sample of older adults, Gretebeck et al. (2013) observed that dog owners who walked their dog reported more total walking, more frequent bouts of walking per
week, and more physical and leisure time activity compared to dog owners who did not walk their dog.

Christian et al. (2013) found that among all reviewed studies, the median prevalence of dog walking among dog owners was 59%. For the studies providing frequency and duration data, they found the median duration and frequency of dog walking to be 160 minutes per week for 4 walks per week (Christian et al., 2013). Thorpe et al. (2006a) found that dog walkers were more likely to walk 150 minutes/week and to walk at faster average pace compared to dog owners who did not walk their dog. Regular dog walkers walked more on average compared to irregular dog walkers and a greater proportion of regular dog walkers were meeting the physical activity recommendations compared to irregular dog walkers (Christian, Giles-Corti, & Knuiman 2010). Oka and Shibata (2012) noted similar results as dog walkers were found to be 3.5 times more likely to meet the physical recommendations and 3.6 times more likely to walk.

Dog walking contributed to 45% of the weekly minutes of physical activity in regular dog walkers compared to 17% in irregular dog walkers (Christian et al., 2010). Hoerster et al. (2011) found that 64% of dog walkers met the physical activity guidelines compared to a lower percentage of 55% of non-dog walkers in a sample of dog owners from two San Diego County veterinarian clinics. Dog walking was independently associated with meeting the moderate-vigorous physical activity guidelines when dog walking, the age of the participant, the location of the veterinary clinic (rural or suburban area), race or ethnicity, sex, income and educational attainment were included in a multivariate model (Hoerster et al., 2011). Richards, McDonough, Edwards, Roseann, and Troped (2013) found similar results as the dog walking population was significantly more likely to meet the physical activity guidelines through walking, compared to owners not walking their dog. Adult dog walkers reported more physical activity per week, as
measured by metabolic equivalent (MET) min/week, compared to non-dog walkers (Lentino, Visek, McDonnell, & DiPetro, 2012). MET refers to metabolic equivalent which is a measure of physical activity, as it is the ratio of the working metabolic rate to the resting metabolic rate and is measured in kcal/kg/hour or in oxygen uptake as ml/kg/minute (Compendium of Physical Activities, 2011b). MET is equal to 1 kcal/kg/hour, is equivalent to the energy costs of sitting quietly, and equals 3.5mL/kg/minute in oxygen (Compendium of Physical Activities, 2011b). For example, dog walking has been assigned a MET value of 3.0 (Compendium of Physical Activities, 2011a).

With regard to leisure-time physical activity, Reeves, Rafferty, Miller, and Lyon-Callo (2011) found that the odds of doing any leisure-time physical activity was 69% higher in dog walkers compared to non-dog walkers. However, this result is not comparable to other studies as leisure-time physical activity was defined differently, as any activity that is not required as an essential activity for daily living (Reeves et al., 2011).

Dog walkers accumulate more physical activity and walking compared to non-dog walkers. With this increase in overall activity and walking, regular dog walkers are more likely to achieve the physical activity recommendations and the related health benefits that accompany such activities.

1.11 Prevalence of Physical Activity Among Dog Owners and Non-dog Owners

Christian et al. (2013) noted that a majority of the reviewed studies reported dog owners had a higher prevalence of achieving the physical activity recommendations, achieving more mean minutes of physical activity per week and achieving more mean minutes per week of walking compared to non-dog owners.
1.11.1 Prevalence related to the physical activity recommendations. After reviewing the published literature from 1990-2010, Christian et al. (2013) reported that, overall, dog owners and dog walkers were more likely to meet the physical activity recommendations compared to non-dog owners and non-dog walkers. Thorpe et al. (2006a) found that dog walkers were 2 times more likely to meet the physical activity recommendations compared to non-dog owners and dog owners who did not walk their dogs. A higher prevalence of meeting the recommendations was reported among dog owners with 33% compared to non-dog owners with 26%, (Oka & Shibata, 2009) and 52% among dog owners compared to 48% among non-dog owners (Schofield, et al., 2005). Coleman et al. (2008) found a higher percentage of individuals meeting the physical activity recommendations was reported among dog walkers with 53% compared to 33% among non-dog walkers. Christian et al. (2010) observed dog owners to be 57% more likely to meet the recommendations after adjusting for intrapersonal, social-environmental and physical-environmental factors. Similarly, results from the RESIDEntial Environments (RESIDE), a 5-year longitudinal study evaluating the impact of urban design on health and walking (The University of Western Australia, n.d.), show that 59% of dog walkers walked their dog ≥90 minutes/week (Christian et al., 2010). They found that 80% of dog owners who walked with their dog ≥30 minutes/day for a minimum of 3 times per week were meeting the physical activity requirements (Christian et al., 2010). In a sample of pregnant women from the United Kingdom, dog owners were found to be 50% more likely to achieve 3 hours of physical activity per week, which is equivalent to the 30 minutes/day most days of the week, compared to women who do not own dogs (Westgarth et al., 2012). When examining participation in any physical activity, Thorpe et al. (2006b) found that dog owners had a higher prevalence than non-dog owners, with 67% and 57% respectively. Ball et al. (2007) found a
higher prevalence of walking for leisure in dog owners compared to non-dog owners with 73% versus 61% respectively. Bauman, Russell, Furber, and Dobson (2001) found dog owners and non-dog owners had an equal prevalence of achieving the physical activity recommendations, with a percentage of 47% among both groups. This equal prevalence between dog owners and non-dog owners may be because a large percentage of the dog owners in the sample reported no dog walking. Specifically, 59% of dog owners reported that they did not walk their dog and this percentage of the sample was significantly less likely to meet the physical activity guidelines compared to those who walked their dog (Bauman et al., 2001). Additionally, dog walkers were slightly less likely to meet the physical activity recommendations overall, with the exception of those who engaged in a minimum 2.5 hours of dog walking per week (Bauman et al., 2001).

Giles-Corti and Donovan (2003) found that dog owners were 1.58 times more likely to achieve ≥180 minutes of physical activity per week compared to non-dog owners. Cutt, Giles-Corti, Knuiman, Timperio, et al. (2008) found that dog owners were 1.59 times more likely to achieve ≥150 minutes of walking per week, respectively, compared to non-dog owners (Cutt, Giles-Corti, Knuiman, Timperio, et al., 2008). Thorpe et al. (2006b) found that dog owners were 1.32 times more likely to have participated in any physical activity compared to adults with no pet.

In older adults, Shibata et al. (2012) and Toohey, McCormack, Doyle-Baker, Adams, and Rock (2013) also observed different patterns of physical activity among dog owners and dog walkers compared to non-dog owners and non-dog walkers. Shibata et al. (2012) found that dog walkers reported significantly more weekly minutes of moderate-vigorous physical activity as well as total physical activity compared to non-dog walkers and dog owners. Generally, older Japanese dog walkers were more likely to achieve 150 minutes of physical activity compared to
non-dog walkers and non-dog owners (Shibata et al., 2012). They reported that 89% of dog walkers achieved the recommended physical activity and that there was a lower prevalence among non-dog walkers and non-dog owners with 61% and 73% respectively. However, in this sample, the intensity of the physical activity was not specified, which may not match the recommendations. Toohey et al. (2013) found that in a sample of adults over the age of 50, those who walked their dog ≥4 times per week were more likely to achieve the recommended 150 minutes per week of neighbourhood-based recreational walking. However, intensity was not taken into account.

Overall, among dog owners, a higher prevalence of meeting the physical activity recommendations was reported compared to non-dog owners. This is important because a higher percentage of dog owners may be experiencing the health benefits associated with the physical activity recommendations and a reduced risk of related non-communicable chronic diseases, for better overall health.

1.11.2 Mean minutes and frequency of walking. Bauman et al. (2001), Brown and Rhodes (2006), Cutt, Giles-Corti, Knuiman, Timperio, et al. (2008), Dembicki & Anderson (1996), Schofield et al. (2005), and Yabroff et al. (2008) observed that dog owners walked more minutes per week compared to non-dog owners. When examining leisure walking, Headey (1999) found that dog owners walked more frequently than non-dog owners, with an average of 4 walks per week compared to 2 walks per week respectively. Thorpe et al. (2006b) noted that dog owners engaged in more mean minutes per week of non-exercise walking with an average of 68 minutes compared to 32 minutes among non-dog owners. Dog owners also participated in more minutes of exercise walking compared to non-dog owners with a mean of 75 and 58 minutes respectively. Dog walking largely contributed to the walker’s weekly minutes of
walking and physical activity, with 48% and 84% contribution respectively (Christian et al., 2010). Brown and Rhodes (2006) found that dog owners spent more time in mild and moderate bouts of walking and physical activities compared to non-dog owners with 300 and 168 minutes per week respectively. When demographic covariates were controlled for, dog-owners reported more total mild walking minutes than non-dog owners with 138 and 60 minutes respectively (Brown & Rhodes, 2006). This activity contributed to overall physical activity levels among dog-owners. When dog walking was removed, they walked less and were less physically active compared to non-dog owners. This underscores the significance of dog walking as a contributor to overall physical activity among dog owners (Brown & Rhodes, 2006). Specifically, dog walkers walked an average of 124 more minutes per week than non-dog walkers (Oka & Shibata, 2012).

In summary, dog owners and dog walkers walked more minutes per week and at a higher frequency compared to non-dog owners and non-dog walkers. This walking contributes to overall physical activity levels and is important because it may assist dog owners and dog walkers in achieving the recommended levels of weekly physical activity.

1.1.1.3 Mean levels of physical activity. Bauman et al. (2001) found that dog owners accumulated more total minutes of physical activity compared to non-dog owners, with 210 and 198 minutes per week respectively. Brown and Rhodes (2006) found a similar result with dog owners accumulating 410 minutes per week and non-dog owners accumulating 288 minutes per week. In an Australian sample, Cutt, Giles-Corti, Knuiman, Timperio, et al. (2008) also noted that dog owners accumulated more minutes of physical activity per week with 322 minutes compared to non-dog owners with 267 minutes. Oka and Shibata (2009) found a similar pattern as dog owners accumulated 17 MET-hours/week in comparison to 11 MET-hours/week among
non-dog owners. Assessing overall physical activity with a pedometer, dog owners took 1,670 more steps/day compared to non-dog owners (Harris, Owen, Victor, Adams & Cooke, 2009). Using NHANES III data of American adults, Gillum and Obisesan (2010) found that dog owners were most likely to be in the highest activity group (engaging in activity 8 times/week) compared to the lowest activity group (engaging in activity 0 times/week), as 25% of dog owners were categorized in the highest activity group compared to only 15% in the lowest activity group. Dog walkers accumulated an average of 130 more minutes of total physical activity and 124 minutes more walking minutes per week than the non-dog walkers (Oka & Shibata, 2012).

Similarly, Coleman et al. (2008) observed that dog owners achieved slightly but significantly more daily minutes of physical activity compared to non-dog walkers (an average of 35 and 27 minutes respectively) and found comparable daily minutes of physical activity (35 minutes) among dog owners and non-dog owners. Schofield et al. (2005) found opposite results with non-dog owners accumulating more total minutes of physical activity per week with 346 minutes compared to dog-owners who achieved 335 minutes. Schofield et al. (2005) also reported that those who were involved in walking their dog were more likely to meet the physical activity guidelines compared to those who did not walk their dog. Households with medium- or large-sized dogs accumulated significantly more minutes of recreational walking per week compared to those with small dogs or no dogs, which may help explain the lower physical activity levels among some dog owners.

Overall, dog owners accumulated more physical activity compared to non-dog owners. Dog owners also participated in more walking, both exercise and non-exercise walking, compared to non-dog owners. Dog owners appear to be more active and have a higher prevalence of meeting the recommendations for physical activity compared to non-dog owners.
1.12 Prevalence of Dog Walking

Bauman et al. (2001) and Johnson and Meadows (2002) found a similar prevalence of dog walking among their adult samples of dog owners, with 41% and 46% respectively. Schofield et al. (2005) and Christian et al. (2013) reported a higher prevalence of dog walking of 60%, while Salmon, Binh Chu and Veitch (2010) and Hoerster et al. (2010) reported 59% and 68% respectively. Cutt, Giles-Corti, Wood, Knuiman & Burke (2008) suggest that many dog owners are not walking their dog, with the prevalence of dog walking only as high as 50%.

Coleman et al. (2008), Cutt, Giles-Corti, Knuiman, Timperio, et al. (2008), and Cutt, Giles-Corti, and Knuiman (2008) found a higher prevalence in their samples with 70%, 78%, and 77%, respectively. Similarly, when examining dog walking in minimum bouts of 10 minutes, Ham and Epping (2006) found a prevalence of 80% among a sample of dog owners. In a sample of Japanese dog owners, Oka and Shibata (2012) found a prevalence of 64% for dog walking among their sample of dog owners and when observing those who walked their dog for an average of 308 minutes per week, and Shibata et al. (2012) found a prevalence of 71%.

Other research suggests that among dog owners, at least 50% to 75% of them walk their dog (Bauman et al., 2001; Brown & Rhodes, 2006). Tudor-Locke and Ham (2008), Harris et al. (2009), Merom, Bowles, and Bauman (2009), and Suminski, Poston, Petosa, Stevens, and Katzenmoyer (2002) found a lower prevalence of 3% in a 24-hour period, 22%, 13%, and 28%, respectively. Similarly, in an Australian sample of adults, Brown et al. (2013) found that 22% of dog owners walked their dog on a daily basis and an even lower 9% reported walking their dog 4-6 times per week. Data from the 2005 Michigan Behavioural Risk Factor Survey, analyzed by Reeves et al. (2011), found that 61% of their sample walked their dog for bouts of at least 10 minutes and 27% reported walking their dog for 150 minutes per week. In a sample of dog
owners and regular and irregular dog walkers, Christian et al. (2010) reported 100% of dog owners walked their dog.

1.13 Correlates of Dog Walking

Westgarth, Christley and Christian (2014) found that the dog-owner relationship is the most important correlate of dog walking. Higgins et al. (2013) noted that the dog-owner relationship was important because participants viewed the dog as a family member and some owners viewed their dog as having a unique role as their walking companion (Higgins et al., 2013). Westgarth et al. (2014) suggest the dog-owner relationship is comprised of several factors including attachment, the frequency of interactions, feelings of support and motivation provided by the dog for dog walking, and obligatory feelings toward the dog. Oka and Shibata (2013) found that attachment to the dog was positively related to dog walking as rates of dog walking were higher among those reporting a greater attachment to their dog. In an Australian study, dog owners with higher scores on a scale that measures dog-owner interactions were more likely to exercise their dog regularly (Rohlf, Bennett, Toukhsati, & Coleman, 2012). Self-efficacy (Hoerster et al., 2011; Oka & Shibata, 2013; Richards et al., 2013) and perceived encouragement or social support were found to be positively associated with dog walking (Christian, Giles-Corti, and Knuiman, 2008; Cutt, Giles-Corti, and Knuiman, 2010; Higgins, Temple, Murray, Kumm & Rhodes, 2013; Hoerster et al., 2011). Christian et al. (2010) and Cutt, Giles-Corti, and Knuiman (2008) reported from the RESIDE study that the perception of the dog as walking motivation was associated with an increased likelihood to walk the dog ≥90 minutes/week. The sense of obligation and commitment that an owner feels to their dog has been positively associated with physical activity (Brown & Rhodes, 2006; Higgins et al., 2013; Hoerster et al., 2011; Johnson and Meadows 2010; Oka and Shibata 2013; Schofield et al.,
Being attentive to the dog’s need for exercise, for socialization and for toilet breaks has been described as motivators for dog owners to walk their dogs (Degeling & Rock, 2012).

There are many other correlates that are either negatively or positively associated with dog walking. For example, dog size is associated with walking, and specifically, smaller dogs are negatively associated with dog walking. This suggests that smaller dogs are walked less compared to larger dogs (Cutt, Giles-Corti & Knuiman, 2008; Schofield et al., 2005). Additional important factors related to dog walking include the number of dogs, which is inversely associated with dog walking (Cutt, Giles-Corti, Wood et al., 2008; Hoerster et al., 2011; Richards et al., 2013; Schofield et al., 2005), the health of the dog, as dogs in better health were positively associated with dog walking (Cutt, Giles-Corti, Wood et al., 2008; Degeling & Rock, 2012; Ham & Epping, 2006; Richards et al., 2013; Schofield et al., 2005), and other environmental factors such as perceived places to walk the dog and higher perception of neighbourhood aesthetics were higher among owners who walked their dogs (Hoerster et al., 2011). The dog’s age was found to be negatively associated with walking the dog (Degeling & Rock, 2012; Hoerster et al., 2011; Richards et al., 2013), and Degeling and Rock (2012) found that owning an older dog was associated with a decreased perceived need for exercise and therefore a reduction in the physical activity of the owner.

Related to the environment, owners having access to dog-friendly features in parks was positively associated with dog walking (Westgarth et al., 2014). For example, the perception of the visual appeal of the neighbourhood was higher among dog walkers (Hoerster et al., 2011), and the walking environment, the dog-specific environment and the presence of sidewalks were all associated with greater odds of dog walking (Richards, et al., 2013). Specifically, streets that are less-walkable were negatively associated with dog walking (McCormack, Rock, Sandalack &
Uribe 2011) and the lack of appropriate facilities and neighbourhood safety were associated with lower dog walking rates (Hoerster et al., 2011). Dog owners who perceived that they had less than average access to public open spaces with dog supportive features were twice as likely to not walk their dog (Christian et al., 2010; Cutt, Giles-Corti, Knuiman, 2008). Off-leash dog parks are correlated with dog-walking behaviours as well. McCormack et al. 2011 found that dog-owners were less likely to walk their dogs if they lived more than 1.6 km from an off-leash park and that off-leash dog parks were found to increase the frequency of dog walking among dog-owners who already walked their dogs (McCormack et al., 2011). This suggests that access to dog parks may promote dog-walking, especially among regular dog walkers (McCormack et al., 2011).

Enjoying a dog, owning an energetic dog, maintenance of both owner and dog weight, the perception that dog walking positively influenced the dog’s health (Richards et al., 2013) and owner’s health (Higgins et al., 2013) were positively associated with dog walking. The belief that the dog does not need to walk was associated with lower dog-walking rates (Hoerster et al., 2011).

Social engagement, outcome expectancies, expectations for dog walking, and social support from family, friends and the dog were associated with higher odds of dog walking (Richards et al., 2013). A negative subjective norm for family, other dog owners and the veterinarian about daily dog walking and the perception that barriers related to the dog discourage daily dog walking were both associated with not walking the dog (Christian et al., 2010; Cutt, Giles-Corti & Knuiman, 2008). Negative subjective norms are one’s perception that important people in their life think they should not engage in the behaviour (Fishbein, 2009).
Hoerster et al., 2011 suggests that a larger percentage of dog owners with higher incomes (≥$60,001) and higher levels of education (those with an advanced degree) report walking their dog compared to those with lower incomes (≤$40,000 and $40,000-60,000) and lower educational attainment (some college, a college degree, or less than high school education), respectively (Hoerster et al., 2011). Reeves et al. (2011) found that dog owners with a college degree were 2.3 times more likely to walk their dog compared to those without a high school diploma. However, Reeves et al., (2011) also found that dog owners with some college education and those with a household income of <$20,000 have a higher prevalence of regular dog walking (≥150 minutes per week), compared to dog owners with less than high school, those with a high school graduation and a college education and those with a household income of >$20,000. This suggests that higher education levels and higher income may not have a clear correlation with dog walking (Reeves et al., 2011). A higher prevalence of dog walking was also observed among owners who were younger (Reeves et al., 2011), male (Hoerster et al., 2011), women with dependents (McCormack et al., 2011), and married individuals (Oka & Shibata, 2012). Additionally, those who brought their pet to the dog park and had veterinarians who assessed dog walking were significantly more likely to walk their dogs (Hoerster et al., 2011).

1.14 Mediators of Dog Walking

There are several mediators of dog walking such as dog obligation, behavioural intention, self-efficacy and the size of the dog. Brown and Rhodes (2006) and Hoerster et al. (2011) found that dog obligation mediated the relationship between owning a dog and the frequency of walking. This suggests that obligation and responsibility are potential mechanisms explaining why dog owners walk more (Brown & Rhodes, 2006). Alternatively, an owner’s behavioural intention to walk was found to be a mediator in the relationship between dog ownership and
increases in recreational walking in a sample of dog owners (Cutt, Knuiman & Giles-Corti, 2008). In addition, Hoerster et al. (2011) suggest that self-efficacy may mediate the relationship between dog walking and increased physical activity levels. Directly related to the dog, Schofield et al. (2005) found its size mediated the relationship between dog ownership and acquiring adequate amounts of physical activity through recreational walking. The ownership of a smaller dog is associated with less walking (Cutt, Giles-Corti & Knuiman, 2008; Schofield et al., 2005).

To summarize, dog obligation, behavioural intention, self-efficacy and the size of the dog are mediators of dog walking among owners. These mediators may be targeted to increase physical activity among owners through dog walking and may be a useful way to increase the success of such an intervention (Hoerster et al., 2011).

1.15 The Theory of Planned Behaviour

Next, the theory that guided the current study, the integrated model of behavioral prediction, as well as theories that influenced the development of this theory (i.e., the integrated model of behavioral prediction) will be discussed. The theory of planned behaviour is derived from a previous theory, the theory of reasoned action. The theory of reasoned action addresses the attitude toward the act or the behaviour and the subjective norm regarding the act or behaviour, both of which influence intention and therefore behaviour (Ajzen & Fishbein, 1980). Ajzen and Fishbein extended the theory of reasoned action through the inclusion of perceived behavioural control, resulting in the theory of planned behaviour (Fishbein, 2009). The theory of planned behaviour, like the theory of reasoned action, proposes that behaviour is determined by the behavioural intention to engage in that behaviour, where behavioural intention is a person’s intention to perform a specific behaviour (Fishbein & Ajzen, 1975). The theory of planned
behaviour states that a person’s intention is influenced by 3 constructs, namely their attitude toward the behaviour, their subjective norms and their perceived behavioural control (Fishbein, 2009). Subjective norms refer to people’s perception of whether important others think they should or should not perform the behaviour (Fishbein, 2009). Perceived behavioural control is the belief that one has the skills and abilities required to perform the behaviour and that one can perform the behaviour despite potential obstacles that may be present (Fishbein, 2009). People’s attitude toward behaviour is shaped by their behavioural beliefs or the perceived consequences of performing the behaviour, balanced with their evaluation of such consequences (Ajzen & Fishbein, 1980). Subjective norms are defined by the normative beliefs, which are the perceptions of whether significant people think they should or should not engage in the behaviour, which is influenced by their motivation to comply with this perceived importance (Ajzen & Fishbein, 1980). Perceived behavioural control is defined by the control beliefs, which are reasons or circumstances that make the behaviour easy or difficult to engage in, balanced by their perceived influence of these reasons or circumstances (Ajzen, 1991). The theory of planned behaviour has been used to successfully predict health behaviours, including walking, in several studies (Darker, French, Eves, & Sniehotta, 2010; French, Stevenson, & Michie, 2012).

1.16 Integrated Model of Behavioral Prediction

The integrated model of behavioral prediction is an extension of Fishbein and Ajzen’s reasoned action theory and theory of planned behaviour (Montaño & Kasprzyk, 2008). The integrated model of behavioral prediction is a framework that may assist in the prediction, understanding and modifying of behaviour (Fishbein, 2000; Institutes of Medicine, 2002; National Academy of Science, 2002) and clearly identifies how key variables from several different theories can fit within a framework of reasoned action (Fishbein, 2009). With the
countless number of variables that may influence the performance of behaviour, the integrated model of behavioral prediction identifies specific variables which are useful to predict, change, understand, or reinforce any behaviour (Fishbein, 2009). Using a reasoned action approach, the health belief model, social cognitive theory, the theory of reasoned action and the theory of planned behaviour provide the framework with 7 crucial determinants of behaviour. The integrated model of behavioral prediction states that intention is the best predictor of specific behaviours and includes specific determinants that influence intention and behaviour. In this model, intention refers to one’s readiness to engage in a specific behaviour (Fishbein, 2009). Research over the past 30 years supports that specific behaviours can be accurately predicted by assessing the appropriate intentions associated with performing that behaviour (Fishbein, 2009).

The core construct of the integrated model of behavioral prediction is behavioural intention which, in turn, predicts behaviour. Environmental factors and skills and abilities are secondary constructs in the model which influence intention. These are secondary constructs because barriers, environmental constraints or lack of skills and abilities can interfere with the intention to perform a specific behaviour (Fishbein, 2009). The 3 core determinants of intention include (a) attitudes, (b) norms and (c) self-efficacy or perceived behavioural control (Fishbein, 2009). Specifically, these 3 core constructs are defined as:

(a) Attitude: One’s attitude toward engaging in that behaviour.

(b) Norms: The normative influence or social pressure that one feels toward performing the behaviour.

(c) Self-efficacy or perceived behavioural control: Belief that one has the necessary skills and abilities to perform the behaviour.

According to the model, these 3 core determinant are influenced by specific constructs:
(a) Attitudes are based on personal behavioural beliefs and outcome expectations (Fishbein, 2009).
   - Behavioural beliefs and outcome expectations are beliefs about the expected outcomes of the behaviour and the evaluation of these outcomes (Fishbein & Ajzen, 1975).

(b) Norms are based on injunctive and descriptive normative beliefs (Fishbein, 2009).
   - Injunctive norms refer to the person’s belief about other’s expectations (Montaño & Kasprzyk, 2008).
   - Descriptive norms are a person’s belief about other’s actual engagement in the behaviour (Montaño & Kasprzyk, 2008).

(c) Self-efficacy or perceived behavioural control is based on personal beliefs of control and perceived power (Fishbein, 2009).
   - Personal beliefs refer to one’s belief about the presence of factors that may assist or interfere with performing the behaviour (Fishbein & Ajzen, 1975).
   - Perceived power is the perception of power that one has over these specific factors (Fishbein & Ajzen, 1975).

According to the integrated model of behavioral prediction, additional background variables influence behavioural beliefs and outcome evaluations, injunctive and descriptive norms, and control beliefs and perceived power. Background variables that indirectly influence behaviour are (a) past behaviour, (b) demographics and culture knowledge, (c) attitudes toward targets, (d) personality, moods, and emotions, (e) other individual difference variables (affecting perceived risk), and (f) intervention and media exposure. Also, the model includes skills and
abilities as well as environmental factors as concepts which prevent people from executing their intention (Fishbein, 2009).

The comprehensive model incorporates important determinants of behaviour through use of multiple theories and it can be effective in predicting behaviour through determinants of intention. Although the theory has not been used to assess walking or dog walking, it has been used to understand and predict other health behaviours. For example, it has been used to predict adherence to post-operative treatment after weight loss surgery (Barbee, 2010), to examine the effects of sexual content on television on sex-related behaviours and cognitions among adolescents (Gottfried, Vaala, Bleakley, Hennessy, Jordan, 2013), and to predict and understand condom use behaviours among those at high risk for HIV (Montano, Kasprzyk, Von Haeften, Fishbein, 2001). It has also been used to examine other constructs such as barriers that instructors face in failing underperforming medical students (Cleland, Knight, Rees, Tracey, & Bond, 2008) and unprofessional behaviour among physicians (Rees & Knight, 2007). Overall, the model is comprehensive and appropriate to predict and understand several different behaviours. Some constructs in the model have been previously used to predict and understand dog walking, as the theory of planned behaviour has been used to guide previous dog walking research. Therefore, the integrated model of behavioral prediction was a useful theory to guide the current study to collect interview data about key determinants of behaviour related to human and animal health.

1.17 The Theory of Planned Behaviour and Dog Walking

To my knowledge, there are no primary academic journal articles using the integrated model of behavioral prediction to assess walking or dog walking. However, the theory of planned behaviour, from which the model was derived, has been used in dog walking research.
Research on dog walking has shown that the theory of planned behaviour constructs are correlated with walking behaviour. Brown and Rhodes (2006) found that the constructs in the theory were correlated with total walking behaviour, specifically perceived behavioural control, intention, instrumental attitude, affective attitude and subjective norms. Brown and Rhodes (2006) found that intention and perceived behavioural control accounted for 13% and dog obligation accounted for 11% of the variance in walking behaviour. In a different study involving a group of dog owners, the theory of planned behaviour constructs explained 47% of the variance in the intention to be physically active (Gretebeck, et al., 2013). In a sample of older adults, Feng et al. (2014) found that dog owners had higher perceived behavioural control and physical activity intention compared to non-dog owners. These dog owners were more physically active and walked more than non-dog owners (Feng et al., 2014). The theory of planned behaviour has also been used in the development of the Dogs and Physical Activity (DAPA) tool that measures factors that relate to dog walking as it is a helpful theory to examine the individual factors that influence dog walking (Cutt, Giles-Corti, Knuiman & Pikora, 2008).

Constructs in the theory of planned behaviour are associated with the intention to dog walk. In an Australian study, Rohlf, Toukhsati, Coleman, and Bennett (2010) noted intention was related to dog walking and strongly related to owners’ reports of exercising their dogs. Brown and Rhodes (2006) found that the constructs were correlated with intention, specifically perceived behavioural control, intention, instrumental attitude, affective attitude and subjective norms. Rolf et al. (2010) found that the intention to exercise the dog was predicted by the owner’s attitudes and perceived behavioural control. Specifically, the owners’ beliefs about the importance of exercising their dog and their perceived control over the factors that facilitate or impede exercising their dog both predicted their intention to exercise their dog (Rolf et al.,
2010). The theory of planned behaviour has been successfully used to examine influential factors on dog walking and can help explain one’s intention to walk their dog.

1.18 One Health and Zooeyia

One Health is a worldwide initiative devoted to improving the overall health of humans and animals by uniting human health care and veterinary medicine (Hodgson & Darling, 2011). It is based on the concept that veterinarians have the responsibility and opportunity to protect and improve the health and well-being of humans as well as animals (Frank, 2008; Hodgson & Darling, 2011). Frank (2008) describes One Health as the integrated efforts of several disciplines on the local, national and global levels, to achieve optimal health for humans and animals, as well as the environment. Degeling, Kerridge, and Rock (2013) explain how human health is intricately linked with the animals we consume, those we have as pets and those surrounding us. Therefore, it is critical for health regulators and research organizations to incorporate this assumption into their work (Degeling et al., 2013).

One Health is concerned with the prevention of diseases spread from animals to humans, also referred to as zoonoses, to achieve optimal health of humans, animals and the environment (Hodgson & Darling, 2011). One Health is also concerned with the health benefits that animals may provide to humans (Hodgson & Darling, 2011). Hodgson and Darling (2011) have created the term “zooeyia”, which is the inverse and opposite of zoonoses, describing the positive effect that animals have on human health (Hodgson & Darling, 2011). Zooeyia and the benefits of the human-companion relationship on human health are demonstrated in the People and Pets Exercising Together (PPET) study (Kushner, Blatner, Jewell, & Rudloff, 2006). PPET has demonstrated how companion dogs can provide social support to humans for the purpose of exercise and weight loss. Hodgson and Darling (2011) also describe how companion animals
influence controllable risk factors such as obesity, physical activity, tobacco or alcohol use and high blood pressure, which are risk factors related to diseases such as cancer, cardiovascular disease and diabetes (Hodgson & Darling, 2011).

Physical inactivity is a significant predictor of chronic disease, and walking may be an excellent method of increasing physical activity among humans (Hodgson & Darling, 2011). To improve and increase exercise and walking patterns, experts often recommend a “buddy system” to provide support (Hodgson & Darling, 2011). Including another person in this “buddy system” is not always beneficial as they can encourage but also discourage exercise and motivation. Alternatively, pets provide reliable and positive encouragement for increasing exercise and are associated with initiation and enjoyment of activity (Kushner et al., 2006). The positive effects of pets on human health have been acknowledged by the US National Institutes of Health. Owning a pet has been thought to benefit human health through psychological growth and development as well as physical health, however there is still much research to be done on the human-animal relationship and the benefits it may have on human health (National Institute of Health [NIH], 2009).

Recent research suggests that dog owners may be healthier and more physically active compared to non-dog owners. Utz (2014) found that dog and cat owners who lived alone were healthier compared to non-pet owners as they were more likely to have a health rating of excellent or very good by self and physician reports. This may be related to another finding of the study, specifically that pet owners were found to be less likely to be obese and were more likely to engage in physical activity outside of walking, compared to those who did not own a pet (Utz, 2014). Additionally, Feng et al. (2014) found that older adults who owned dogs had better general health and physical function compared to those who did not own dogs. They found that
in older adults, dog ownership had a positive and significant effect on physical activity, and those who owned dogs were 27% more active and walked 12% more compared to non-dog owners (Feng et al, 2014). Utz (2014) and Feng et al. (2014) exemplify the positive effect that dog ownership and dog walking may have on human health.

Overall, it is suggested that the partnership of the medical and veterinary profession will enhance overall health of humans (Hodgson & Darling, 2011). Similarly, Smith (2013) suggests that modern science and veterinary medicine should benefit from the strong correlation between human and animal health in several disciplines, including nutrition and obesity. The concept of One Health can enhance zooeyia, as animals can aid in improving human health. The collaboration of veterinary and medical professionals may be a valued initiative in future health promotion (Hodgson & Darling, 2011).

1.19 Health Professionals and Physical Activity

1.19.1 Credibility of physical activity advice. Physicians and various health care professionals are in a unique position to address physical activity and healthy eating among their patients. They often have the first opportunity to provide a primary exercise and diet intervention and therefore have a critical role in delivering preventive health information (Loureiro & Nayga, 2006).

1.19.1.1 Physicians. Family physicians are viewed as a very credible source of information (Baer, 1997) and have a valued role in communities (Pfeiffer, Clay, & Conatser, 2001). Patients view clinicians as a trusted source for physical activity advice (Gnanendran, Pyne, Fallon, & Fricker, 2011) and they often rely on their health care providers as a central source for information and recommendations (Albright et al., 2000). Physicians have an important role in encouraging exercise (Pfeiffer, 2011) and can provide informative advice to
promote healthy lifestyles (Albright et al., 2000). Their credibility is highlighted through recent research, suggesting approximately 66% of patients would have an increased interest in being physically active if their physician advised it (Berryman, 2011). The credible and well-respected status of physicians presents them with the opportunity to influence changes in health behaviour, specifically exercise behaviours (Bock, Diehm, & Schneider, 2012).

General practitioners’ advice to patients can positively affect lifestyle change, including changes in diet and exercise behaviour (Ashenden, Silagy, & Weller, 1997). Physician prescribed exercise is associated with commencement of an exercise program (Ng & Irwin, 2013). Providing specific exercise prescriptions increases the likelihood of experiencing the health benefits associated with aerobic activity (Petrella, Koval, Cunningham, & Paterson, 2003).

Physical activity counselling delivered by physicians was found to be effective as self-report physical activity increased significantly after counselling. Specifically, the frequency of physical activity in bouts of at least 10 minutes increased significantly, the mean duration of physical activity increased to meet the recommendation of 30 minutes/day, and increases in moderate-intensity physical activity were observed (Spink, Reeder, Chad, Wilson, & Nickel, 2008). From a review of the literature, Eakin, Glascow, and Riley (2000) concluded that physician physical activity counselling in a primary care setting was moderately effective over a short-term period. Studies that reported more effective physical activity counselling had patient-tailored interventions and take-home written materials (Eakin et al., 2000). Overall, there are mixed and inconclusive results suggesting that physical activity counselling in primary health is useful in increasing physical activity (Eden, Orleans, Mulrow, Pender & Teutsch, 2002). This does not undermine that primary health physicians are regarded credible for preventive health information (Baer, 1997; Gnanendran, Pyne, Fallon, & Fricker, 2011).
1.19.1.2 Veterinarians. Veterinarians are specialty healthcare professionals with a primary role in animal health. They are responsible for vaccinating, administering medication, performing surgeries, and providing general health care for all animals (Wisconsin Veterinary Medical Association [WVMA], 2010). They are respected doctors of veterinary health and are the only doctors of health educated and skilled to protect both humans and animals, coinciding with the collaboration of medical and veterinary professions of the One Health initiative (WVMA, 2010).

Veterinarians, like physicians, have a critical role in providing support and recommendations to their clients for the promotion of animal health. Veterinarians are expected by their clients to be competent and to have the knowledge and the skills to properly care for their clients’ pets (Coe, Adams, & Bonnett, 2008). They are also expected by pet owners to educate clients on all aspects of their pets’ care and to be an accessible source of information for the care of their pets (Coe et al., 2008). Bok et al. (2014) demonstrated the importance that veterinarians place on their expertise in practice, as they were more likely to rate veterinary expertise as the highest competency in their practice.

Caring for pets involves counselling clients on all dimensions of animal health including exercise and nutrition (WVMA, 2010). This exercise and nutrition counselling involves informing clients about the importance of maintaining their dog’s ideal body weight and preventing obesity (Bland et al., 2010). Veterinarians also deliver specific obesity recommendations for dogs by providing their clients with advice on exercise and feeding practices (Rohlf, et al., 2010). Discussions of obesity and weight loss are becoming more common among veterinarians and clients, and veterinarians are concerned with successful management of obesity (Heinze & Linder, 2013).
Similar to physicians, veterinarians are viewed by their clients as credible because they have comprehensive knowledge and expertise for the care of animals (Ingwersen, 2004). They are viewed as a reliable resource for weight-loss assistance as the majority of dog owners reported they would seek such help from a veterinarian versus other sources (Bland, Guthrie-Jones, & Hill 2010).

Veterinarians can influence human health as their counselling can influence physical activity among owners of overweight dogs. This is evident in the second phase of Owners and Pets Exercising Together (OPET). The group of owners who were counselled by their veterinarian to increase physical activity to promote their dog’s health, reported a significant decrease in the amount of time spent sitting and larger increases in physical activity, compared to a group receiving general health counselling from their veterinarian (Goodie et al., 2011). Byers et al. (2014) noted that dog owners were typically willing to follow exercise programs that were recommended by their veterinarian. It remains unclear whether veterinarians’ counselling influences increases in physical activity among owners of overweight dogs (Goodie et al., 2011). However, this lack of knowledge does not undermine the credibility that veterinarians have regarding animal health and wellness.

The credibility of veterinarians is highlighted in other areas of veterinary medicine through client compliance and adherence to specific recommendations. Veterinarians influence their clients’ compliance specifically to dietary recommendations. The confidence that clients have in their veterinarian’s recommendation influences their adherence to such dietary advice (Abood, 2008). Veterinarians also influence client adherence in other aspects of veterinary medicine, specifically dental and surgical recommendations. Kanji, Coe, Adams, and Shaw (2012) found clients were 7 times more likely to have the dental or surgical procedure for their
dog when the veterinarian provided a specific recommendation. Although not in weight-loss or physical activity areas, this highlights the credibility of veterinarians and the important influence of their specific recommendations on client adherence (Kanji et al., 2012).

1.20 Veterinarians in Dog Walking Interventions

Veterinarian credibility and influence on client adherence may be vital to promote dog walking and in dog-walking physical activity interventions, as they are a significant source of knowledge and expertise. Veterinarians can positively influence sitting time and physical activity among dog owners through specific exercise counselling (Goodie et al., 2011). Their participation in future dog walking interventions is important in order to advise and promote dog walking and exercise practices. It is valuable to understand veterinarians’ perceptions of dog walking and gather information related to their discussions of dog walking with their clients. This information will help understand their promotion and counselling of dog walking with clients and assist in involving them in dog-walking physical activity interventions. In the present study, practicing veterinarians will be consulted to gather information about their attitudes, subjective norms, self-efficacy, barriers and skills and abilities regarding dog walking to gain insight into their perceptions of and experiences with counselling about dog walking. Gathering information about veterinarians’ perceptions and behaviours related to dog walking can help to increase veterinarians’ promotion of dog walking among clients. This data may also assist to involve veterinarians in dog walking interventions, since their expertise and credibility is vital.

1.21 Conclusion

Physical activity improves physical fitness and helps to delay and prevent undesired health outcomes (USDHHS, 2008a) and reduces the risk of many chronic diseases (PHAC, 2011). Physical activity can aid in disease prevention by reducing risk factors such as obesity,
high blood pressure, high blood cholesterol and high triglyceride levels (USDHHS, 2008a). Since there are multiple health benefits of physical activity, physical activity guidelines have been created to increase activity levels among Canadians. Despite the benefits and specific recommendations for physical activity, Canadian adults are not achieving the recommended levels for frequency, intensity, and duration (Colley et al., 2011).

Walking is a very opportune and comfortable way to increase physical activity because it is easy, accessible and inexpensive (Epping, 2011). Walking is safe and effective for those who are sedentary and is suitable for all fitness levels (Hootman et al., 2001). Brisk walking is classified as a form of moderate-vigorous physical activity, which is the intensity recommended by CSEP and PAGA, and may be an ideal method to meet these recommendations (USDHHS, 2008a).

In Canada, 33% of households own a dog (Perrin, 2011). Dog owners are more likely to achieve the physical activity recommendations and attain more minutes of physical activity per week compared to non-dog owners (Christian et al., 2013). Dog walkers report more total walking time, leisure activity, and total physical activity compared to non-dog walkers (Gretebeck et al. 2013). As a result, dog walkers are more likely to meet the physical activity recommendations (Christian, Giles-Corti, & Knuiman 2010), however the half of dog owners not active with their pets is an identified opportunity to improve human health (Ham & Epping, 2006).

Dog walking is related to the start and maintenance of physical activity and may assist individuals in meeting the physical activity recommendations (Ham & Epping, 2006). Dog obligation mediates the relationship between owning a dog and walking the dog, possibly explaining why dog owners walk more (Brown & Rhodes, 2006). However, a negative
subjective norm for the veterinarian about daily dog walking has been found to have a negative association with dog walking (Christian et al., 2010; Cutt, Giles-Corti & Knuiman, 2008). There is an opportunity to establish purposeful and long-term physical activity interventions through dog walking (Morgan, 2001) and veterinarians have an important role in promoting this activity among owners (Christian et al., 2010; Cutt, Giles-Corti & Knuiman, 2008).

Similar to physicians, veterinarians are credible as they have comprehensive knowledge and expertise (Ingwersen, 2004) and are a reliable resource for weight-loss assistance in pets (Bland, Guthrie-Jones & Hill, 2010). In turn, their counselling may increase physical activity among dog owners and could positively influence physical activity through specific exercise recommendations (Goodie et al., 2011). Veterinarians’ participation in interventions to advise and promote dog walking and exercise practices is evidently important in order to advise and promote dog walking among owners. However, to utilize veterinarians’ expertise and counselling for dog walking promotion and in dog-walking physical activity interventions, it is important to understand their perceptions of and experiences with counselling about dog walking. This information can be used to involve them in dog walking interventions, specifically as a resource for physical activity counselling.

After reviewing the literature, the author has not found any scholarly data regarding veterinarians’ perceptions of dog walking. This is evidently a gap in the literature and it is important to gather data to better understand veterinarians’ perceptions of and experiences with counselling about dog walking. Specifically, it will be useful to understand veterinarians’ perceptions of and experiences with counselling about dog walking and which factors influence their intentions and behaviour to discuss or counsel dog walking as exercise with dog owners. Again, veterinarian counselling can assist to increase physical activity among dog owners.
(Goodie et al., 2011), and it is important to examine veterinarians’ perceptions of and experiences with counselling about dog walking in order to engage veterinarians in the promotion of dog walking and to be involved in dog-walking physical activity interventions.

By studying veterinarians’ attitudes, subjective norms, self-efficacy, barriers and skills and abilities regarding dog walking, we can understand their perceptions of and experiences with counselling about dog walking and what influences their discussions of dog walking as exercise with dog owners. The implication of such research is to uncover perceptions and other factors that may facilitate or prevent discussions of dog walking exercise with their clients. Ultimately, veterinarians’ counselling and expertise can increase the likelihood of success in dog-walking interventions (Goodie et al., 2011).
1.22 Study Purpose

The main purpose of this study is to understand veterinarians’ perceptions of and experiences with counselling about dog walking. Secondly, additional contextual data will be collected regarding dog ownership, dog walking habits and general physical activity patterns of the veterinarians. There is very limited research on veterinarians’ perceptions about dog walking. More specifically, to our knowledge, there is no research focusing on understanding dog-walking counselling among veterinarians in practice. This study aims to address this gap in the literature by conducting qualitative interviews to understand perceptions of and experiences with counselling about dog walking among a sample of practicing veterinarians. Ultimately, this is important because veterinarians are a credible source of information and may be influential regarding dog walking. By understanding their views and practices regarding dog walking and their challenges to discussing dog walking, healthcare organizations will be better positioned to support veterinarians in promoting physical activity among owners and pets including their involvement in focussed dog-walking interventions.
Chapter 2.0 Research Objectives

The objectives of this research are:

1. To determine:
   a. Veterinarians’ behaviours, specifically whether they counsel their clients on dog walking in veterinary appointments.

2. To examine:
   a. Veterinarians’ attitudes (including behavioural beliefs and outcome evaluations) toward dog walking and dog-walking counselling.
   b. Veterinarians’ perceived norms about dog-walking counselling that dog owners and other veterinarians have.
   c. Veterinarian’s self-efficacy regarding dog-walking counselling.

3. To examine:
   a. An environmental factor, specifically external barriers to counselling clients on dog walking as a practicing veterinarian.
   b. The skills and abilities related to counselling clients on dog walking as a practicing veterinarian.

4. To gather supplementary contextual information about participants, specifically:
   a. Dog ownership (i.e., owns dog or does not own dog).
   b. Dog walking and general physical activity patterns (i.e., frequency, duration, and intensity).
Chapter 3.0 Method

3.1 Participants

To be eligible for participation in the study, participants had to be a veterinarian with a general class licence to provide veterinary care for dogs in the province of Ontario. Exclusion criteria for this study were veterinarians with restricted licence classes (i.e., when conditions or restrictions have been placed on the licence), post-graduate/resident licence classes (i.e., those enrolled as an intern, resident or Doctor of Veterinary Science student) or educational licence classes (i.e., those enrolled in post-graduate studies in veterinary medicine) as well as those who are in private practice and do not provide general wellness care (i.e., those who work for government and industry agencies and those who exclusively provide specialized care). Eligible veterinarians were recruited for participation from the cities of Cambridge, Guelph, Kitchener and Waterloo in Ontario. Veterinarians from these cities make up a large proportion (217 veterinarians) of the veterinarians in Southern Ontario, therefore providing a large sampling frame and these cities are also in close proximity to the University of Guelph. The sample for this study consisted of 17 participants from southern Ontario. As Crouch and McKenzie (2006) suggest, exploratory, concept-gathering research is best done using small sample sizes. Specifically, a sample as small as 20 participants or less may be appropriate to establish rapport and gather comprehensive data. Also, the research can be more focused and the data can be easily and thoroughly managed and analyzed throughout the stages of the research with a small sample size (Crouch & McKenzie, 2006). Additionally, research by Guest, Bunce and Johnson (2006) suggests that as few as 12 interviews may be required for data saturation. With this support for a small sample size in exploratory research using in-depth interviews, 17 veterinarians were recruited and interviewed for the main study.
Convenience sampling was used to recruit two veterinarians for piloting study materials. Participants for the main study were selected using purposive and random sampling to recruit 11 veterinarians (Gray, 2014). An additional 6 veterinarians were recruited using snowball sampling involving recommendations of other veterinarians interested in the topic from participating veterinarians. Random sampling was used to select veterinarians to invite for participation in the study, which can help reduce researcher bias in the selection of participants, and to enhance the credibility of the data (Shenton, 2004). Data saturation occurred in this group of participants in the main study at 15 veterinarians. Data saturation occurs when no new or related data emerges or when the researcher does not see or hear new information from participants (Saumure & Given, 2008; Siegle, 2002). Data analysis occurred concurrently with interviews, which assisted the researcher and the research assistants (i.e., two undergraduate thesis students) to determine when data saturation had occurred (Siegle, 2002). The results from four questions related to participants’ demographics are presented in Table 1. Most of the 17 participants were female (94.1%) and dog owners (88.2%). All participants were graduates from the Ontario Veterinary College, with almost half (47.1%) of participants graduating between 2010 and 2013.
Table 1. Demographic characteristics of the sample (n=17)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1 (5.9)</td>
</tr>
<tr>
<td>Female</td>
<td>16 (94.1)</td>
</tr>
<tr>
<td><strong>Veterinary college attended</strong></td>
<td></td>
</tr>
<tr>
<td>Ontario Veterinary College</td>
<td>17 (100)</td>
</tr>
<tr>
<td><strong>Year of graduation from veterinary college</strong></td>
<td></td>
</tr>
<tr>
<td>1986-1989</td>
<td>2 (11.8)</td>
</tr>
<tr>
<td>1990-1993</td>
<td>1 (5.9)</td>
</tr>
<tr>
<td>1994-1997</td>
<td>0</td>
</tr>
<tr>
<td>1998-2001</td>
<td>1 (5.9)</td>
</tr>
<tr>
<td>2002-2005</td>
<td>3 (17.6)</td>
</tr>
<tr>
<td>2006-2009</td>
<td>2 (11.8)</td>
</tr>
<tr>
<td>2010-2013</td>
<td>8 (47.1)</td>
</tr>
<tr>
<td><strong>Owns a dog</strong></td>
<td>15 (88.2)</td>
</tr>
</tbody>
</table>

Note. Percentages may not add up to 100 due to rounding.
3.2 Research Design

A cross-sectional research design was used in that the data were gathered at a single point in time via one interview with each participant (Neuman & Robson, 2015). This qualitative research employed an interpretivist approach, interview transcripts were systematically and directly analyzed while the focus of the analysis was on the meaning of the interview data (Guest, MacQueen, & Namey, 2012). This research is phenomenological as data regarding the participants’ perceptions and lived experiences as practicing veterinarians were collected (Guest et al., 2012). Consistent with a phenomenological approach, this study used semi-structured interviews with open-ended questions allowing participants to discuss their experiences in their own words (Guest et al., 2012).

3.3 Measures

3.3.1 Demographic and background information. Demographic and background information were collected from each participant after completion of the interview. Each participant completed either the Background and Demographic Information Questionnaire for face-to-face interviews (Appendix A), or the Background and Demographic Information Questionnaire for telephone interviews (Appendix B). The demographic information collected from participants included their name, gender, year of graduation from veterinary college, and veterinary college attended. In addition, this questionnaire included one general question addressing dog ownership and four additional questions regarding dog-walking habits. The last four questions were used to determine if participants walk their dog, and if so, the frequency and duration of their dog walking. Participants were asked to recall their dog walking in minimum bouts of 10 minutes during the past 7 days. Specifically, participants were asked to recall how many days in the last week that they walked their dog and the duration of dog walking on one of
those days. Additionally, dog owners in the sample were asked about moderate-intensity dog walking. Moderate-intensity dog walking defined as dog walking that takes moderate physical effort and makes the owner breathe somewhat harder than normal. Participants were specifically asked to report how many days in the last week that they engaged in moderate-intensity dog walking and the duration of dog walking on one of those days.

3.3.2 International Physical Activity Questionnaire - Short Form (IPAQ-SF). After completion of the interview, the IPAQ-SF was used to estimate physical activity levels of participants, as contextual information. Participants completed one of two versions, either the IPAQ-SF: Last 7 Days Self-Administered Format for face-to-face interviews (Appendix C) or the IPAQ-SF: Last 7 Days Telephone Format for telephone interviews (Appendix D). The IPAQ-SF offered an appropriate method to gather contextual data for the study, as it is a commonly used national and regional scale for surveillance of physical activity (IPAQ, 2001).

The IPAQ-SF consists of seven general questions regarding physical activity, walking and sitting patterns in the last seven days. Specifically, participants were asked to recall the number of days they engaged in walking, moderate activities, and vigorous activities for at least 10 minutes at a time during the last 7 days. Also, participants were asked to report how much time they usually spent walking and doing moderate and vigorous activities on one of those days. After participants completed the IPAQ-SF, four separate scores were calculated for each participant. Firstly, three scores were calculated, one for walking, one for moderate activity and one for vigorous activity. These three scores were calculated using MET values (i.e., values that indicate the energy expenditure of specific activities; for example, sitting is a 1-MET activity; Ainsworth et al., n.d.) and frequency and duration for each activity, and the scores are expressed as MET-minutes/week. The MET values used for these calculations were 3.3 METs for walking, 4.0
METs for moderate activity, and 8.0 METs for vigorous activity. Secondly, a fourth score was calculated for total physical activity. This score was calculated for each participant by taking the sum of his/her: (a) walking MET-minutes/week, (b) moderate MET minutes/week, and (c) vigorous MET-minutes/week.

Next, each participant’s four calculated scores were then used to categorize his/her activity level as low, moderate or high, using the Guidelines for Data Processing and Analysis of the IPAQ - Short and Long Forms (IPAQ, 2005). According to these IPAQ guidelines, there are 2 criteria to classify an individual’s physical activity level as high: (a) vigorous-intensity activity on at least 3 days achieving a total minimum physical activity of at least 1500 MET-minutes/week or (b) 7 or more days of any combination of walking, moderate-intensity activities, or vigorous-intensity activities achieving a total minimum physical activity of at least 3000 MET-minutes/week. The IPAQ guidelines provide 3 criteria to classify an individual’s physical activity level as moderate: (a) 3 or more days of vigorous-intensity activity at least 20 minutes per day, or (b) 5 or more days of moderate-intensity activity and/or walking at least 30 minutes per day, or (c) 5 or more days of any combination of walking, moderate-intensity activities, or vigorous-intensity activities reaching a total minimum physical activity of at least 600 MET-minutes/week. To classify an individual’s physical activity level as low, he or she must not meet the criteria outlined in the moderate or high levels of activity. The IPAQ-SF also includes one question to estimate the average time that participants spent sitting per day during the last 7 days. This value, which reflects time spent in sedentary activity, is not used to compute any of the physical activity scores (IPAQ, 2005).

The IPAQ-SF has established reliability and validity for use among young and middle-aged adults and can be self-administered in research projects (IPAQ, 2001). Craig et al. (2003)
examined several IPAQ instruments and reported on the reliability and validity of each measure. They specifically reported that the IPAQ-SF is as reliable as other scales for measuring physical activity. When examining the test-retest reliability of the IPAQ-SF in a study involving many countries, 75% of the correlation coefficients were large and ranged between .65 and .88 (Craig et al., 2003). Craig et al. (2003) also reported that the reliability of the IPAQ-SF: Last 7 Days Self-Administered Format for face-to-face interviews was not different from the IPAQ-SF: Last 7 Days Telephone Format for telephone interviews. In terms of concurrent validity, the level of agreement between the short and long form of the IPAQ was found to be reasonable with a coefficient of .67. Both the long and short forms have acceptable measurement properties compared to other self-report physical activity measures (Craig et al., 2003).

3.4 Semi-structured Interview Guide

A semi-structured interview guide was used in the face-to-face and telephone interviews with participants in the main study. This interview guide was pilot tested with two veterinarians, who are clinical faculty employed at the Ontario Veterinary College (OVC), University of Guelph. The pilot used a similar procedure to the main study and involved: contacting each participant using an invitation letter (Appendix E) and a follow-up phone call inviting participation using a predetermined script (Appendix F), obtaining informed consent (Appendix G), and conducting an interview. After the interview in the pilot study, the two participants: (a) completed the Background and Demographic Information Questionnaire for face-to-face interviews and the IPAQ-SF Last 7 Days Self-Administered Format for face-to-face interviews, (b) provided feedback on the interview questions by completing the Pilot Study Feedback Questionnaire (Appendix H), (c) completed a form to decide if they want to be re-contacted or not to provide information about the study to other veterinarians (Appendix I), and (d) were provided with a
$20 gift card for Starbucks as compensation for their time. Positive feedback was given regarding the interview process and interview guide, and therefore no revisions were made prior to the commencement of the main study. Data collected from the pilot was excluded because both participants worked at the OVC where they are involved with teaching veterinary students; therefore, their interviews were considered not representative of veterinarians in day-to-day general practice.

The interview guide for the pilot study and main study consisted of 12 questions and additional prompts developed to examine theoretical constructs from the integrated model of behavioral prediction (Appendix J). These theoretical constructs were examined to understand veterinarians’ perceptions and their counselling regarding dog walking. To achieve the research objectives, the following main constructs in the integrated model of behavioral prediction were addressed: attitudes, norms, self-efficacy, environmental factors (specifically external barriers), skills, abilities and behaviour.

To examine attitudes, questions directed at participants’ behavioural beliefs and outcome evaluations related to dog walking and counselling were included. Behavioural beliefs and outcome evaluations are the beliefs about the expected outcomes of the behaviour and the evaluation of these outcomes, respectively (Ajzen & Fishbein, 1980). To examine norms, both injunctive and descriptive normative beliefs were addressed. Injunctive norms are the beliefs about others’ expectations regarding one’s own engagement in the behaviour and descriptive norms are the beliefs about others’ engagement in the behaviour (Montaño & Kasprzyk, 2008). Self-efficacy was examined by assessing control beliefs (Fishbein, 2009). Control beliefs are beliefs that reasons or circumstances will make the behaviour easy or difficult to engage in (Ajzen, 1991). External barriers and skills and abilities were also examined. External barriers
are constraints that may influence an individual’s performance of behaviour (Fishbein, 2009). Skills and abilities refer to the skills and capabilities that an individual has that may influence his/her performance of behaviour (Fishbein, 2009). Behaviour was examined by inquiring about participants’ approaches to counselling dog owners on dog walking in veterinary appointments.

3.5 Procedure

Ethics clearance from the Research Ethics Board (REB) at the University of Guelph was obtained (Appendix K). Two undergraduate thesis students from the Applied Human Nutrition program at the University of Guelph were also involved in this research. Their role was to assist the researcher in transcribing and analyzing the data from the interviews. Both undergraduate thesis students completed the core on-line tutorial for the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans. This course supported them in becoming familiar with significant topics and issues regarding research ethics.

To establish dependability in this study, the researcher reported the steps of the research process in detail. Recording the steps of the study process establishes dependability in three ways (Shenton, 2004). First, the study procedure is described in detail below to allow for a future researcher to repeat our work. Second, this in-depth documentation of the research process allows our team to assess the research process and to ensure that proper steps were taken. Third, by reporting our research process, this allows the reader to develop an understanding of our methodology and its efficacy (Shenton, 2004). The detailed procedure of this study is described below.

Participants’ voluntary informed consent was obtained and their personal information remained confidential. The researcher created a master list on her laptop with the names of the participants, the number assigned to each participant, and the date of the interviews. Only the
researcher and the research advisor had access to the master list of participant names and corresponding participant numbers. This list was securely confined under lock and key in Dr. John Dwyer’s filing cabinet in his office. The researcher and the students had their laptops encrypted by the university to ensure confidentiality of the participants’ data. These encrypted laptops were used to access, share and work on data pertaining to the study (i.e., transcribing the audio-recorded interviews). The researcher and the two undergraduate thesis students used Briefcase to electronically share data from the study, specifically the audio-recordings and transcripts. Briefcase is a secure method of data sharing within GryphMail (the University of Guelph’s communication site with email, calendaring and secure file storage).

Veterinarians were contacted at the veterinary clinic at which they are employed. The information for the veterinary clinics was gathered from an online public database of the College of Veterinarians of Ontario (CVO) called “Find a Veterinarian”. This database provides the name, address, phone number, patient group (i.e., companion animals) and patient type (i.e., dogs, cats, reptiles, and other animals treated) for each veterinarian. The database was used to locate veterinarians in the aforementioned cites by entering the specific cities into the search area. The CVO webpage generated a total of 303 veterinarians who provide veterinary care for dogs, when entering the city names “Cambridge”, “Guelph”, “Kitchener” and “Waterloo” in the search area. Using the data from the CVO webpage, the researcher manually filtered out potential participants who did not meet the inclusion criteria for participation (i.e., those with restricted licence classes, post-graduate/resident licence classes and educational licence classes as well as those who are in private practice and do not provide general veterinary care). The final sampling frame consisted of 140 eligible participants. The names of these 140 eligible veterinarians were numbered and organized in a table in an Excel spreadsheet. Using “research
randomizer", a number generating software, 40 numbers were randomly selected and the corresponding veterinarians were contacted and invited to participate in the study. Eligible veterinarians were contacted in increments of 40, and this selection process was completed twice. Thus, a total of 80 eligible veterinarians were contacted for participation.

Participants were also recruited by snowball sampling. Following the conclusion of each interview, participants filled out a form to record whether they would like to be re-contacted or not in the event that we decide to recruit more veterinarians (Appendix I). If they chose to be re-contacted, they were provided with a study information sheet (Appendix L) to give to other veterinarians when it was decided to recruit more participants. Using a snowball sampling approach, this information sheet provided the study information and asked potential participants to contact the researcher by phone or email if they are interested in taking part in an interview.

The researcher mailed an information letter to potential participants containing the names of the research team, a brief description of the study and contact information for members of the research team (the researcher and the research committee) (Appendix M). The researcher contacted the veterinary clinics via phone using a phone script (Appendix N) approximately one to two weeks after mailing the information letter. The phone script included the name of the researcher, the affiliation with the University of Guelph, a brief description of the research, and a request to speak with the veterinarian. The researcher invited potential participants to contact her via phone or email. Interview times and dates were scheduled via phone or email and the veterinarians met with the researcher at a time, date and location to accommodate the participants. Telephone interviews were also offered to accommodate participants and these interviews were scheduled at a time and date chosen by the participants. Prior to the interviews,
participants received a copy of the consent form for face-to-face interviews (Appendix O) in person or via email or the information letter for telephone interviews (Appendix P) via email.

Each of the individual face-to-face interviews took place at a location convenient for the participants. This location was typically the veterinary clinic that the researcher commuted to or a private room in the Family Relations and Applied Nutrition Department. The researcher greeted and thanked participants for their time. Participants were encouraged to ask any questions and were informed that they could withdraw from the study at any point or refuse to answer any questions. Participants were informed that the interview would be audio-recorded and that their interview and personal data would remain confidential. For face-to-face interviews, the researcher provided participants with another copy of the consent form (Appendix O). The consent form included brief information about the purpose of the study, the inclusion criteria, and the procedure (i.e., the questionnaires, the interview process and data analysis). The researcher asked participants to read the consent form and then the participant and the researcher signed the form. For telephone interviews, in lieu of a consent form, the researcher provided an information letter to participants (Appendix P). This information letter included brief information regarding the purpose of the study, the inclusion criteria and the procedure (i.e., the questionnaires, the interview process and data analysis). The researcher turned on the audio recorders and then used a consent script to obtain oral consent for telephone interviews which outlined that: (a) the participant had read the information about the study, (b) the participant’s questions had been answered, (c) the participant agreed to participate in the study and (d) the participant had a copy of the information letter (Appendix Q).

To ensure that no data were lost due to a device malfunction, two audio-recorders were used during face-to-face and telephone interviews. One audio-recorder was on the researcher’s
encrypted laptop and the second was on a portable audio-recorder set up on the table. The researcher put the phone call on speaker function for the telephone interviews to ensure that the interview was recorded. By audio-recording the interviews, this gave the researcher the opportunity to use constant comparison to ensure rigour in this qualitative research, specifically to confirm that the data were credible and dependable (Guba & Lincoln, 1989; Lincoln & Guba, 1985). The researcher had a copy of the interview guide as well as a notepad and pen to note significant thoughts or questions that the researcher or participants may have throughout the interview.

The interview guide was used to conduct the interviews and the interviews lasted approximately 30-45 minutes. After the interviews, participants completed the two self-administered measures that took approximately 5 minutes in total. These self-administered measures included the Background and Demographic Information Questionnaire for face-to-face interviews and the IPAQ-SF: Last 7 Days Self-Administered Format for face-to-face interviews or the Background and Demographic Information Questionnaire for telephone interviews and the IPAQ-SF: Last 7 Days Telephone Format for telephone interviews.

Participants were also given the opportunity to decide if they want to be re-contacted or not to provide information about the main study to other veterinarians. There was a form for participants to complete after the face-to-face interview (Appendix I) or telephone interviews (Appendix R) to document their choice. If they wanted to be re-contacted, they were provided with a study information sheet (Appendix L) in person or via email for them to give to other veterinarians in the event that it was decided to recruit more participants. This process introduced snowball sampling as a method for recruitment.
The researcher invited participants to decide if they would like to provide feedback on the summary of themes identified across all interviews. Their choice was documented using either the Main Results Feedback Form for face-to-face interviews (Appendix S) or the Main Results Feedback Form for telephone interviews (Appendix T).

Finally, participants were given a $20 gift card for Starbucks as a token of appreciation for their participation for face-to-face interviews or they were sent the gift card via mail for telephone interviews. The researcher asked the participants to sign the Participant Compensation Form for face-to-face interviews (Appendix U). For telephone interviews, the researcher asked participants to send her an email upon receiving the token of appreciation. If the researcher did not hear from a participant regarding receiving the gift card, a follow-up email was sent to inquire about the gift card (Appendix V). Within 24 hours after the face-to-face or telephone interviews were completed, the researcher downloaded the audio-recorded interviews from the second recording device to her laptop.

3.51 Data Analysis.

The researcher used IBM Statistical Package for the Social Sciences (SPSS) 22 to analyze the contextual, quantitative data for participants. This data includes the participant’s sex, the year that he/she graduated from veterinary college, the veterinary college that he/she graduated from, dog ownership (i.e., owns dog or does not own dog), and dog walking and general physical activity patterns (i.e., frequency, duration, and intensity). The data from the IPAQ-SF: Last 7 Days Self-Administered Format for face-to-face and the IPAQ-SF: Last 7 Days Telephone Format for telephone interviews were analyzed using the Guidelines for Data Processing and Analysis of the IPAQ Short and Long Forms (IPAQ, 2005). As outlined in the IPAQ Scoring Protocol, the researcher calculated four IPAQ scores for walking, moderate activity, vigorous
activity and total physical activity for each participant. Each participant’s four calculated scores were used to categorize his/her activity level as low, moderate or high, using the Guidelines for Data Processing and Analysis of the IPAQ - Short and Long Forms (IPAQ, 2005).

The researcher and two undergraduate thesis students manually transcribed the audio-recorded interviews verbatim in Microsoft Word. The students transcribed 5 audio-recorded interviews on an encrypted laptop, while the researcher transcribed the remaining 12 interviews. The researcher reviewed all 17 of the transcripts while listening to the audio-recordings and made edits as required. This process of transcript auditing is important and ensures data accuracy before analysis begins (Tuckett, 2005). As explained below, the interview transcripts were analyzed using thematic analysis to identify and examine the themes to understand veterinarians’ perceptions of dog walking (Guest et al., 2012).

Three types of coding were used for data analysis, specifically open coding, axial coding and selective coding. First, data-driven, open coding was used to identify preliminary key themes. A theme captures important details of the data related to the research question and represents a pattern or meaning in the set of data (Braun & Clarke, 2006). During open coding, the researcher and undergraduate thesis students independently assigned preliminary themes in the margins of the transcripts as they read the transcripts. This process is a form of memoing, as the researcher and the two undergraduate students made reflective notes about the data. Memoing adds to the credibility and the trustworthiness of qualitative research as it provides records of the meaning that is derived from the data (Groenewald, 2008). The researcher and undergraduate students then created a list of preliminary themes to represent the data from the transcribed interviews (Neuman & Robson, 2015). After they individually generated preliminary themes for the first three transcripts, they met with each other to review transcripts and preliminary themes
to reach consensus on the initial set of themes. During this process, the researcher and the students constantly compared the transcripts to the list of preliminary themes to ensure the transcript data were accurately represented in this consensus of themes. This constant comparison technique is critical to the credibility or the truth value of the study as it allows the researcher to ensure that the analyzed data accurately represents the collected data (Guba & Lincoln, 1989; Lincoln & Guba, 1985; Sandelowski, 1986). Once a consensus of themes was reached, the researcher and students created a codebook that included a list of preliminary themes, a description of each theme, and illustrative quotes for themes. The researcher and students used this codebook to apply themes to the remaining 14 transcripts. They added to, updated and shared this codebook with the research team as new themes were identified.

Subsequently, the researcher downloaded the transcripts into NVivo 10 software, which was used to manage the qualitative data. The researcher, in consultation with the undergraduate thesis students, then used axial coding to reflect on how the preliminary themes identified in the 17 transcripts were connected to one another and then she organized them into larger clusters (Neuman & Robson, 2009). These themes and their descriptions were then revised and these revisions were used to create an updated master codebook. Codes for the corresponding themes were created and they were included in the codebook. By having multiple individuals analyze the data, analyst triangulation was employed. Analyst triangulation establishes data credibility by using multiple sources to understand and analyze data (Denzin, 1978; Patton, 1999). This type of triangulation strengthens the quality of the data by ensuring they are comprehensive and well-developed (Denzin, 1978; Patton, 1999). After the process of axial coding, the researcher emailed the Script for Review of and Feedback on Main Results form (Appendix W) and a summary of the results for member checking (Appendix X) to participants. The 17 participants
were asked to review and provide feedback on whether these themes captured the information that they shared in the interview. However, none of the participants responded to provide feedback on the results. The themes and codes were then entered into NVivo 10. Then the researcher used selective coding as she read each transcript again to apply the master list of codes to segments of text and to highlight good illustrations of themes (Neuman & Robson, 2015).
Chapter 4.0

Manuscript: Veterinarians’ perceptions of and experiences with counselling about dog walking

Manuscript prepared in the format of the Journal of the American Veterinary Medical Association
Veterinarians’ perceptions of and experiences with counselling about dog walking

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This manuscript represents a portion of a thesis submitted by Kathleen E. Burns to the Department of Family Relations and Applied Nutrition at the University of Guelph as partial fulfillment of the requirements for a Master of Science degree.

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Abstract:

Objective: To understand veterinarians’ perceptions of and experiences with counselling about dog walking.

Design: Qualitative study of individual in-person and telephone interviews.

Sample: 17 veterinarians licensed to provide veterinary care to dogs in Ontario.

Procedures: Individual in-person or telephone interviews were conducted using a semi-structured interview guide. The interview questions were developed to examine constructs from the Integrated Model of Behavioral Prediction, a behavior change theory. Thematic analysis was used to analyze the interview transcripts.

Results: Most of the participating veterinarians were female (94.1%) All participants were graduates from the Ontario Veterinary College, and 2010-2013 was the most common range of years for graduation (47.1%). Based on self-report data collection, 88.2% of the participants were dog owners and all dog owners in the sample reported walking their dog. Participants identified specific situations when they discuss dog walking with dog owners related to the dog’s physical condition, life stage and behavior. Participants described barriers to dog walking counselling including dog owners’ lack of compliance, and physical condition, as well as the dog’s behavior and lack of time/low priority in appointments.

Conclusions and Clinical Relevance: Veterinarians face barriers to having dog-walking conversations with their clients. By reducing these barriers and improving veterinarians’ discussions of dog walking with their clients, there is an opportunity to positively influence dog walking habits among pet owners which will lead to health benefits for both people and dogs.
Abbreviations

IMBP: Integrated Model of Behavioral Prediction

IPAQ: International Physical Activity Questionnaire

IPAQ-SF: International Physical Activity Questionnaire - Short Form

MET: Metabolic Equivalent
Introduction

Daily dog walking is important for the overall general health of dogs.\textsuperscript{1} There are benefits among dogs associated with dog walking which include weight loss, weight maintenance\textsuperscript{2} and reduction in problem behaviors.\textsuperscript{3} To support a dog’s need for regular exercise, it is recommended that dogs be walked 2-3 times per day.\textsuperscript{4} Physical activity is also important to living a healthy lifestyle among humans and helps reduce the risk of many chronic diseases.\textsuperscript{5} It is recommended that adults accumulate 150 minutes of moderate-intensity physical activity in bouts of at least 10 minutes throughout the week.\textsuperscript{6} Dog owners and regular dog-walkers are more likely to meet these physical activity recommendations compared to non-dog owners and non-dog walkers\textsuperscript{7} and dog ownership is strongly related to the maintenance of a physically active lifestyle among dog owners.\textsuperscript{8} Dog walking can benefit both humans and dogs as it provides an opportunity for them to be physically active together. This mutual benefit supports role of dog walking in the worldwide initiative of One Health, an initiative devoted to improving the health of animals and humans.\textsuperscript{9}

Veterinarians estimate that approximately 55% of companion dogs do not receive adequate exercise to promote good health, and this may be contributing to the rising incidences of canine overweight and obesity.\textsuperscript{10,11} Canine obesity is classified as 15-20% above a dog’s ideal weight\textsuperscript{11} and is associated with several adverse health effects including a reduction in lifespan, an increased risk of osteoarthritis\textsuperscript{12} dermatological diseases, certain cancers\textsuperscript{13} and diabetes.\textsuperscript{14} Rates of canine overweight and obesity are rising, and an estimated 53% of dogs are overweight or obese.\textsuperscript{10} Overweight and obesity in companion dogs is often associated with human management, specifically caused by an excess intake of required energy and/or inadequate exercise.\textsuperscript{10,11}
Similar to rates of canine overweight and obesity, rates of overweight and obesity among human adults have continued to rise in Canada over the past 5 years and 54.0% of Canadian adults are currently overweight or obese in Canada. Only 15% of the Canadian adult population is meeting the physical activity recommendations, which may be a contributing factor to this rise in obesity rates. Overweight and obesity are associated with the risk for many human adverse health effects including high blood pressure, stroke, type 2 diabetes, metabolic syndrome, and certain types of cancer. Overweight and obesity in humans is often associated with diet and physical activity, specifically the imbalance of calories in via diet and calories out via exercise.

Regular daily walking is one approach to increasing the exercise levels of dogs and their owners which can promote overall health and may help to reduce the incidence of overweight and obesity among dogs and their owners. Despite the mutual benefits of dog walking, a large percentage of dog owners do not walk their dog regularly with the suggested prevalence of dog walking being 59% of dog owners.

One way to encourage dog walking for the benefit of animals and human health is for veterinarians to discuss and promote dog walking with owners during veterinary appointments. The average dog visits the veterinarian 2.6 times per year with their owner, therefore presenting the opportunity for veterinarians to play an important role in discussing and promoting dog walking with owners. Additionally, veterinarians have an important role in positively influencing both dogs’ and humans’ physical activity levels by providing specific counselling related to dog walking.

To support veterinarians in advising and promoting dog walking, a current understanding of their perceptions of, experiences with and barriers to counselling about dog walking is
important. By understanding these perceptions, experiences and barriers, strategies can be developed to better position veterinarians to be involved in the promotion of dog walking. Constructs from the Integrated Model of Behavioral Prediction (IMBP), a behavior change theory, are relevant and useful for providing a framework to understand veterinarians’ perceptions, experiences and barriers to counselling pet owners about dog walking. The IMBP framework has been used to predict and understand behavior within other health professions. The core construct of this theory is behavioral intention (one’s readiness to engage in a specific behavior) which, in turn, predicts behavior. This theory suggests that there are 3 main constructs that directly influence intention: attitudes (one’s attitude toward engaging in a behavior), norms (the normative influence or social pressure that one feels toward performing a behavior), and self-efficacy (the belief that one has the necessary skills and abilities to perform a behavior). Secondary constructs that influence intention are external barriers (constraints that may influence an individual’s performance of behavior) and skills and abilities (skills and capabilities that an individual has that may influence his/her performance of behavior). Additionally, there are background factors such as behavior and demographics that indirectly influence behavior.

The IMBP has previously been used to understand and predict several health behaviors including adherence to post-operative treatment after weight loss surgery, the effects of sexual content on television on sex-related behaviors and cognitions among adolescents, and to predict and understand condom use behaviors among those at high risk for HIV and the behavior of health professionals.

To our knowledge there have been no studies examining veterinarians’ perceptions or their counselling behaviors regarding dog walking. The purpose of this qualitative study was
therefore to understand veterinarians’ perceptions, counselling behaviors and barriers relating to the promotion of dog walking within veterinarian-client-dog interactions using constructs from the IMBP, specifically attitudes, norms, self-efficacy, external barriers, and skills and abilities.

**Materials and Methods**

The University Research Ethics Board provided clearance for this study.

**Study design** - In the main study, eligible participants from 4 cities in southern Ontario (Kitchener, Cambridge, Waterloo and Guelph) were recruited using an online database of the College of Veterinarians of Ontario called “Find a Veterinarian”.a This database provides the name, address, phone number, patient group (i.e., companion animals) and patient type (i.e., dogs) for practicing veterinarians in Ontario. The database has a filtered search option, which was used to identify participants in the 4 cities who met the previously mentioned criteria. To be eligible for participation in the study, participants had to be practicing veterinarians with a general class license and providing veterinary care to dogs according to the College of Veterinarians of Ontario. Eligible participants were numbered and then randomly selected for contact using Research Randomizer website.b The sampling frame was 140 eligible veterinarians. Specifically, 80 veterinarians from the sampling frame were randomly selected and invited by letter and subsequently by phone, to participate in the study. Recruitment continued until data saturation was achieved, which occurred after the interview with participant 15. Data saturation occurs when no new or related data emerges or when the researcher does not see or hear new information from participants.31,32 Participants’ demographics are presented in Table 1. Most of the participants were female (94.1%) and dog owners (88.2%). All participants were graduates from the Ontario Veterinary College, and 47% of participants graduated between 2010 and 2013.
Individual face-to-face or telephone interviews were conducted with participating veterinarians. The interviews were conducted using a semi-structured interview guide and ranged from 30-45 minutes. After the interview, participants completed the Demographic and Background Questionnaire for either face-to-face interviews or for telephone interviews and either the IPAQ-SF: Last 7 Days Self-Administered or Telephone Format for face-to-face or telephone interviews, respectively. The questionnaires collected the same information through different formats, for face-to-face or telephone interviews. Then participants indicated if they wanted to be re-contacted to provide information regarding the study to other veterinarians, which supported recruitment via snowball sampling. Also, participants were invited to subsequently provide feedback on the summary of themes from all interviews. Participants were given a $20 Starbucks gift card as a token of appreciation at the end of the interview.

**Demographic and Background Questionnaire**

These questionnaires were used to collect information on participants’ gender, veterinary college attended and year of graduation from veterinary college during face-to-face or telephone interviews. This questionnaire also included one general question about dog ownership and four additional questions regarding dog-walking habits. The last four questions were used to determine if participants walk their dog, and if so, the frequency and duration of their dog walking. Participants were asked to recall how many days in the last week (i.e., 7 days) that they had walked their dog for at least 10 minutes and the total duration of dog walking on one of those days. Additionally, dog owners in the sample were asked how many days in the last week that they engaged in moderate-intensity dog walking and the duration of dog walking on one of those days. Moderate-intensity dog walking was defined for the participants as activities that take moderate physical effort and makes the owner breathe somewhat harder than normal.
International Physical Activity Questionnaire – Short form

Participants also completed either the International Physical Activity Questionnaire – Short form (IPAQ-SF) Last 7 Days Self-Administered or Telephone Format accordingly. These IPAQ-SF formats were used to estimate each participant’s physical activity level. Both IPAQ-SF formats consist of seven general questions regarding physical activity, walking and sitting patterns in the last seven days. Specifically, participants were asked to recall the number of days that they engaged in walking, moderate-intensity activities, and vigorous-intensity activities for at least 10 minutes at a time during the last 7 days. Also, participants were asked to report how much time they usually spent walking and doing moderate- and vigorous-intensity activities on one of those days. The IPAQ-SF has acceptable measurement properties compared to other self-report physical activity measures. Test-retest reliability between .7-.8, and criterion validity of rho=.30 based on comparisons to accelerometer data have been reported.

Interview structure -

A semi-structured interview guide (Table 4) was used in the face-to-face and telephone interviews in the main study. The interview questions were developed to examine constructs from the IMBP. To understand the participants’ behaviors and perceptions, the following main constructs in this model were addressed: behavior (if/how participants talk to owners about dog walking), attitudes (the importance and benefits of dog walking), norms (of dog owners and other veterinarians), external barriers (barriers that participants experience when talking to owners about dog walking), self-efficacy (participants’ confidence in talking to owners about dog walking), and skills and abilities (the training that participants received regarding counselling owners on dog walking). This interview guide was pilot tested with two veterinarians, who are faculty employed at the Ontario Veterinary College (OVC), University of
Guelph. Positive feedback was given regarding the interview guide and interview process, and therefore no revisions were made. Data collected from the pilot study was excluded because both participants worked at the OVC where they are involved with teaching veterinary students; therefore, their interviews were considered not representative of veterinarians in day-to-day general practice.

The final interviews were audio-recorded. Audio-recording allowed the researchers to use constant comparison when transcribing the data, to confirm that the transcripts were accurate before analysis began.34,35

**Data analysis -**

IBM Statistical Package for the Social Sciences (SPSS) 22.0 was used to analyze the quantitative data, which included participants’ demographic and background information and their IPAQ-SF data. In accordance with the IPAQ Scoring Protocol, four separate scores were calculated for each participant.36 First, three scores were calculated: one for walking, one for moderate-intensity activity, and one for vigorous-intensity activity for each participant. These scores were calculated using MET values (i.e., values that indicate the energy expenditure of specific activities; for example, sitting is a 1-MET activity)37 and frequency and duration for each activity, and then they were expressed as MET-minutes/week. The MET values used for these calculations were 3.3 METs for walking, 4.0 METs for moderate-intensity activity and 8.0 METs for vigorous-intensity activity. Secondly, a fourth score was calculated for total physical activity. This score was calculated for each participant by taking the sum of his/her: (a) walking MET-minutes/week, (b) moderate MET minutes/week, and (c) vigorous MET-minutes/week. Next, each participant’s four calculated scores were then used to categorize his/her activity level as low, moderate or high, using the Guidelines for Data Processing and Analysis of the IPAQ -
Short and Long Forms. These IPAQ-SF formats also included one question to estimate the average time that participants spent sitting per day during the last 7 days. This value, which reflects time spent in sedentary activity, is not used to compute a physical activity score.

The interviews were transcribed verbatim by 3 members of the research team (the first, fourth and fifth authors) and each transcript was compared to the audio recording and reviewed by the first author to ensure accuracy. NVivo 10 was used to manage this qualitative data. Thematic analysis was used to analyze the qualitative data. Specifically, open coding, axial coding and selective coding were conducted. Three team members, the first (KB), fourth (GT) and fifth (SW) authors, first performed open coding, which involved creating and assigning preliminary themes in the margins of the transcripts. Open coding is a form of memoing which adds to the credibility and the trustworthiness of qualitative research as it provides records of the meaning that is derived from the data. Second, the three team members performed axial coding, which involved reviewing preliminary themes to identify new themes, merge themes and identify connections among themes. At this stage, a summary of the study results was sent to participants inviting them to comment on whether these themes captured the information that they shared in the interview. Third, the first author used selective coding to further collapse themes and select quotes to represent the themes. Analyst triangulation establishes data credibility and strengthens the quality of the data by ensuring they are comprehensive and well-developed. Analyst triangulation is the use of multiple sources to understand and analyze data and specifically here, the use of three authors to review and analyze the data.
Results

Participating Veterinarians’ Dog Walking Patterns and IPAQ-SF Scores – The results regarding dog-walking patterns among the participating veterinarians in the sample owning a dog are presented in Table 2. All dog owners in the sample reported walking their dog. These dog owners reported walking their dog for an average of 4.6 days in the last 7 days for an average duration of 40.3 minutes on a typical day. Dog owners reported walking their dog at a moderate-intensity level for an average of 3.6 days in the last 7 days, for an average duration of 25.9 minutes on a typical day.

Participants’ IPAQ-SF results are presented in Table 3. This information for walking, moderate-intensity physical activity and vigorous-intensity physical activity was reported in minimum bouts of 10 minutes during the last 7 days. Participants reported walking for an average of 5.1 days and an average of 53.2 minutes on a typical day. Regarding moderate-intensity physical activity, participants engaged in an average of 3.5 days of this activity, for an average of 31.2 minutes on a typical day. Participants engaged in an average of 2.8 days of vigorous-intensity physical activity, for an average of 39.9 minutes on a typical day. Participants were placed in 1 of 3 categories to reflect their levels of physical activity. Just over half of the participants were classified in a high level of activity (52.9%), 29.4% were in a moderate level of activity, and 17.6% were in a low level of activity. Participants reported sitting for an average of 4.3 hours per day during the last 7 days.

Veterinarians Behaviors and Approaches to Discussing Dog Walking – Regarding veterinarians’ approaches and behaviors to discussing dog walking with dog owners, most participants described how dog walking is not a typical discussion during routine veterinary appointments and that they counsel dog owners on dog walking if the dog owner initiates the
conversation. For example, participant 11 said “Unless [dog walking] is brought up directly to me, it’s not usually a normal talking point for routine exams.” Similarly, participant 4 stated “Mostly if [the dog owners] bring [dog walking] up. If they ask questions about it. So usually it is client driven.”

Most participants identified specific situations in which they discussed dog walking with dog owners. These situations related to the physical condition of the dog, the life stage of the dog or the behavior of the dog.

In terms of the physical condition of the dog, just over half of participants talked to dog owners about dog walking only when the dog has an obvious, overt health issue. Participants discussed not talking about dog walking with owners when the dog appears healthy and when there are no health concerns for the dog. For example, participant 2 said “If there’s not an overt problem, I probably don’t mention it [dog walking] very often.” Also, participant 15 mentioned “In a general health exam or vaccine appointment, if the dog is young, healthy and fit, I probably wouldn’t bring [dog walking] up.”

Overweight and illness were two physical conditions that participants indicated had an influence on their discussions about dog walking. First, many participants reported talking about dog walking specifically if the dog appears to be overweight or if the dog has a body condition score classified as overweight or obese. Body condition scoring is used to assess body composition. It involves both the visual and palpable evaluation of the bone structure of the animal, specifically the evaluation of the vertebrae, ribs and pelvis. Participant 2 said “I only approach [dog walking] if the dog seems to be out of shape. Overweight is common.” Participant 16, who also described only talking about dog walking when the dog is overweight, supported dog walking as a strategy to promote weight loss. This participant said “The only time
that [dog walking] comes up is when you have a dog that is overweight and we’re trying to come up with some kind of weight loss plan.” As a first step in approaching overweight or obesity, many participants discussed that it is important for dog owners to be aware that their dog is overweight or obese. Participants often talked about doing a body condition assessment in appointments and how they use this to help owners understand that their dog is overweight. For example, participant 4 said “Sometimes it’s hard to get [the owners] to accept that their dog is overweight…. So I do body condition out of five and I tell them where their dog stands.” Likewise, participant 14 explained “When I’m doing my physical exam, I show them [the owners] how I’m assessing the body condition. I show them … what I’m looking for and I do actually have a body condition chart in the room with me.”

Relating to discussions with owners of overweight and obese dogs, most participants reported discussing both nutrition and physical activity with dog owners of overweight or obese dogs. Participants often expressed the importance of incorporating changes to both the diet and physical activity regimen to treat overweight dogs, as the combination of both changes is likely to be more effective than one change. For example, participant 7 said “Then [I] discuss both the combination of diet and exercise and how those should be done together.” Similarly, participant 16 discussed “It’s all about the calories in and calories out balance. If they’re not burning calories, then they also need to be counseled about the exercise … more regular, consistent exercise. You can’t just cut down the calories dogs get because then they might become deficient in nutrients.”

Regarding nutrition, many participants described making recommendations to control or reduce the current food intake and the treats that the dog is getting. For instance, participant 15
said “[During the appointment, we focus on] measuring the food or being aware of what we’re feeding, cutting cookies out, or appreciating what low-calorie treats we can feed.” Participants also discussed changing the diet of an overweight or obese dog. To illustrate, participant 5 mentioned “On the diet side of things, sometimes it means switching to a reduced-calorie diet.”

In terms of physical activity, many participants reported discussing general recommendations as a strategy to reduce overweight and obesity. They described recommending increases to the dog’s physical activity or current walking routine. For example, participant 12 said “The basic thing I talk about is [the] activity level and increasing that, … and more frequent walks are an easy way to approach that.” Similarly, participant 5 said “In terms of the exercise, you just need to get them more active. Calories going in have to be used. It’s just getting them to be more active.”

In contrast to a combined discussion of nutrition and physical activity, some participants reported using nutrition-focused approaches to counselling owners of overweight or obese dogs. They described talking to owners specifically about feeding with less focus on physical activity, when addressing overweight or obesity. For example, participant 10 said “I focus more on diet because it’s something I can provide. I can tell them how much to feed and I can control [the diet]. Less focus on the walking.” Similarly, participant 13 stated “Sometimes I’ll actually talk against exercise as ‘Your dog is not going to lose this 20 percent obesity problem it has unless it also eats less calories.’”

Many participants discussed using follow-up appointments as an approach to treating overweight or obesity in dogs. These follow-up appointments are used to track weight changes and changes in body condition score. For instance, participant 11 said “For the overweight ones, our usual way to go about it is getting them to come in for regular weigh-ins every week or every
two weeks.” Participants also discussed follow-up appointments as a time to provide support and advice to owners of overweight or obese dogs. For example, participant 8 explained:

“We do a lot of follow-ups at our clinic…. We’ll call in two weeks time and say ‘Do you want to stop by and weigh?’, ‘Do you have any questions?’, ‘Have you initiated a feeding change or an increase in the exercise levels?’, and we’ll stay with people and work with them through it.”

In addition to overweight, many participants also described talking to owners about dog walking when the dog has a general injury or illness. For example, participant 10 said “The only time that I concentrate on dog walking is after an animal had an injury and we’re starting to get back to the dog walking…. It’s not something I routinely do on a typical annual.” Also, participant 5 stated “If there has been an illness, a surgery or an injury, then exercise and walking comes up in terms of when and how much at that point.”

Many participants described how the life stage of the dog influences discussions of dog walking with dog owners. Specifically, some participants reported talking about dog walking when the dog is a puppy and their discussions of dog walking include recommendations for young dogs. For instance, participant 17 said “In our puppy visits, I often touch on [dog walking], … getting out to exercise twice a day.” Participants also talked about providing advice regarding dog-walking training and dog-walking recommendations when owners bring their puppies to the clinic. For example, participant 6 stated “Puppies hate their leashes and hate being restrained in any way, shape or form, and we discuss the training with [dog owners]. In terms of how often they should walk and how long they should walk.” Additionally, some participants talked about how they address dog walking among the owners of older dogs. To illustrate, participant 12 said “That [dog walking] definitely comes up, especially when there are
animals that are starting to get a little bit older and if we’re talking about the pet slowing down.” Participants also discussed more frequent discussions of dog walking with owners of older dogs as their risk of injury from exercise increases. For example, participant 3 said “It [dog walking] does become a much more common discussion with geriatric dogs, and then it’s ‘what’s an appropriate length of exercise?’”

Many participants stated that the behavior of the dog influences discussions of dog walking in routine veterinary appointments. They are more inclined to talk about dog walking with an owner when a dog has behavioral issues. For example, participant 6 said “A lot of behavioral issues stem from lack of getting that energy out. They need that energy outlet, so if I hear behavioral issues, then that [dog walking] is kind of my first go to.” Similarly, participant 2 described

“One other time when I do bring [dog walking] up is behavior problems. If I have a dog that clearly is just not getting enough stimulation … I will definitely address [dog walking] and strongly encourage [the owner] to get [their dog] more exercise.”

**Participating Veterinarians’ Attitudes** toward dog walking– Most participants perceived dog walking as an important part of dog ownership. For example, participant 6 said “I think it [dog walking] is a huge aspect of owning a dog, absolutely.” Additionally, participant 4 stated “Yes, very [important]. I think that [dog walking] is part of owning a dog.” In contrast to dog walking being an important part of dog ownership, a couple of participants perceived that dog walking is not always important. They commented that dog walking is not important for all dogs and that other forms of exercise can be beneficial. To illustrate, participant 1 said “I think it depends on the dog. I think there are some dogs that are quite happy to get played with and go out in the yard. If they never went for a walk, they would not miss it.”
Participants elaborated on their perceived benefits of dog walking. Three major themes were identified: bonding, benefits for the dog, and benefits for the owner.

Many participants discussed how dog walking promotes bonding between the dog and the owner as it is a time for the owner and dog to spend together. For example, participant 3 commented “[Dog walking] is good bonding for the pet and the owner.” Additionally, participant 4 said “I think [dog walking] is part of the bonding process, not just the exercise part.” Participants also discussed how dog walking strengthens the existing human-animal bond. To illustrate, participant 11 said “I think [dog walking] strengthens the bond between the owner and the pet.”

Participants commented that dog walking has many benefits for the dog including physical, social and mental benefits. First, many participants described the physical benefits that dog walking can have for the dog. Some physical benefits include weight management, maintained functionality and disease-risk reduction. For example, participant 7 said “From a health perspective, keeping good lean body mass and keeping the right weight and keeping good muscle. Muscle is so important in preventing arthritis and keeping bone structure the way it should be.” Also, participant 2 commented “The physical aspect of [the dog] burning off some energy and improving muscle mass and mobility.” Participants also discussed weight loss, improvements to general health, longevity and injury prevention as benefits of dog walking. For example, participant 9 said “There is weight loss, and just the general healthiness and stamina of the animal.” Additionally, participant 15 explained “If they [the dogs] are moving, then they’re keeping their joints healthy and they’re maintaining muscle mass … and controlling arthritis…. We want them to live long and taking them for walks means they get to live longer.”
Secondly, many participants also discussed the social benefits that dog walking has for the dog. They often identified the social interactions with other dogs and other people as a benefit to dog walking since it provides the opportunity for dogs to meet new people and other dogs. For example, participant 4 said “I think it [dog walking] is good for the dog for socialization … with other dogs and other people.” Also, participant 9 stated “The interaction with other animals and there is the social interaction with other people.”

Thirdly, many participants discussed the mental benefits that dog walking provides for the dog. Participants highlighted how dog walking can benefit the dog’s behavior and help to prevent behavioral issues by providing an energy release. For example, participant 13 said “I’ve learned that exercise can solve a lot of behavior problems, more than I would’ve thought. A tired dog is going to chew less, do less destruction in the house.” Participants also talked about the mental health benefits of dog walking. To exemplify this, participant 1 said “There are a lot of high-energy dogs that really benefit emotionally, for their well-being, from that [dog walking] exercise.” Participant 7 also explained “Exercise is important for their [the dogs’] mental health … [because the] less they’re getting walked, the more anxious they are.” Participants also talked about mental stimulation as a benefit of dog walking. For example, participant 2 commented “For dogs, it [dog walking] is their main mental stimulation over the course of the day because they spend the rest of the day in the same environment.” Participant 14 also said “[In terms of stimulation,] the only time a lot of dogs go outside is on their walks.”

Participants also highlighted that dog walking can benefit the owner. They discussed the physical and social benefits that are associated with dog walking. First, many participants (13) talked about how dog walking provides the opportunity for owners to go outside and get exercise. For example, participant 4 said “For the person, getting out of their house, getting fresh
air and getting exercise.” Additionally, participant 2 mentioned “[Dog walking] is good for you because it forces you to get outside and it would be easy not to go out that day or not do [exercise] otherwise.”

Secondly, many participants discussed the social benefits for the owner. Participants highlighted how owners benefit because they interact with other people and with other dogs. For instance, participant 11 stated “[Dog walking] also gives you the chance to socially interact with other dogs, other people or both.” Additionally, participant 9 said “They [dog owners] are also interacting with different animals and different people. So they probably meet more people that way.” Participants also discussed how dog walking can encourage relationships between dog owners and other people including neighbors, family and other dog owners. For example, participant 5 described

“You get out there walking and you meet your neighbors and you can build relationships from there. I think it’s a very good way to build a sense of community in your neighborhood as well. People have dogs and they’re out walking, and it just naturally occurs.”

Also, participant 14 mentioned “There can also be a huge social impact, I know people that go at the same time every day…. So they meet those people, and those people then become their friends.”

Veterinarians’ Subjective Norms— Many participants perceived that other veterinarians do discuss dog walking with their clients in a similar capacity to themselves, which relates to descriptive norms (i.e., the perception that other veterinarians are doing the behavior). For example, participant 18 said “We do definitely talk [about dog walking] because I know the veterinarians here all share a similar view point [on dog walking].” Also, participant 8 said “I
would think that most people bring up dog walking.” A few participants described how a focus on preventive medicine has influenced veterinarians’ discussions of dog walking with owners. To illustrate this, participant 7 said “I would like to think that there has been a shift in the last years where [veterinarians] are really trying to be preventive as opposed to just fixing problems, and walking and nutrition becomes a big part of that.” Participant 14 also explained “There has been a move towards preventive medicine in the last 15, 20 years in veterinary medicine so I think it [dog walking] is a much more common thing than maybe it would have been.”

Many participants discussed that dog owners do not have expectations that their veterinarian talk about dog walking, which relates to **injunctive norms** (i.e., the perception that others think you should or should not engage in the behavior). To exemplify this, Participant 12 explained “It is probably not an expectation when the clients come in, that we’re going to talk specifically about that [dog walking]. I have never had someone specifically come with a question about walking their pets.” Additionally, participant 4 described

“I would say that people sometimes seem surprised that I bring up anything other than the medical and the nutrition side of things. It [dog walking recommendations] wouldn’t be something coming from us. That would be more from a dog trainer or from someone else, but not from the veterinarian.”

**External Barriers** – Three themes were identified when participants were asked about the challenges they face when talking to dog owners about dog walking: owner-related barriers, dog-related barriers and time/priority barriers in appointments.

Participants described several **owner-related barriers** that they experience when talking to dog owners about dog walking. They discussed how an owner’s busy schedule, lack of compliance to dog-walking recommendations and physical condition are all owner-related
barriers. First, many participants discussed that a dog owner’s busy schedule is a barrier when talking to them about dog walking. For example, participant 2 said “[Dog owners] are pretty much as busy as they can be and they don’t tend to have time or necessarily the energy to get out more with their dog, or even get out maybe as much as they should.” Additionally, participant 17 said “The main challenge for people sometimes is time. They say ‘Oh I don’t have time’.”

Secondly, some participants described that dog owners’ lack of compliance with dog-walking recommendations as a challenge for them when talking about dog walking. For instance, participant 8 said “I think the biggest challenge is the follow-through. People will put things off and I find the follow-through is the hardest part.” Additionally, participant 16 stated “You could make [dog-walking] recommendations and if they [dog owners] don’t comply, then that would be the biggest challenge.”

Thirdly, most participants described how the physical condition of the dog owner makes the discussion of dog walking more difficult. One situation where the discussion of dog walking is difficult is when owners have a physical disability that affects their ability to walk. To illustrate, participant 12 commented “For the most part, I think it [dog walking] is pretty approachable, and the only scenario would be if the owner is physically disabled in a way that they are not able to get their pet out and walk them.” Additionally, participant 7 said “If owners are either unfit or if they are unwell, and you get people with disabilities that actually can’t walk”. Another situation where participants indicated discussions of dog walking were complicated was when the owner appeared to be overweight or obese. For instance, participant 3 explained “When they [the dog owner] are obese themselves. Absolutely, that’s always a difficult conversation.” Also, participant 11 described
“If they [dog owners] are really overweight and have a hard time walking around and getting around, then sometimes it is a hard sell. I can understand that it is a challenge for some owners to take on that responsibility [of dog walking].”

Some participants described dog-related barriers as a challenge when talking to owners about dog walking. For instance, participant 15 stated “The behavior of the dog on the walk can be a huge one [challenge]. So I have dogs who are leash aggressive, or aggressive toward other dogs.” Participant 11 also said “The two biggest challenges that come to mind are that the dog is really difficult to walk, a really big puller, or just really bad on leash.”

Some participants discussed that time/priority issues in appointments with owners make conversations about dog walking more difficult. To exemplify, participant 5 said “Time is a big factor in whether something like walking your dog gets talked about.” Additionally, participant 10 described

“The biggest challenge is time. There are so many things in the appointment if I had the time to discuss, I would love to. I think that’s one of the reasons why it [dog walking] hasn’t come up as often, unless it’s an issue.”

Secondly, some participants described dog walking as a low priority in appointments, which makes it difficult for them to talk to owners about dog walking. To explain this, Participant 13 said “In an appointment when there are a lot of things on the table, it [dog walking] will be less of a priority because we’re working on other things.”

**Veterinarians’ self-efficacy** - Most participants described having a high level of confidence related to talking about dog walking with dog owners. For instance, participant 2 said “I have pretty good confidence that my [dog walking] recommendations are appropriate and accurate. In fact, I have a high confidence that they are.” Also, participant 12 stated “It [my
confidence] is pretty high. I promote dog walking because I think it goes hand and hand with owning a pet.” Most participants described that this confidence originates from their personal experiences. They discussed how their previous or current dog ownership has positively influenced their confidence in talking to dog owners about dog walking. To illustrate, participant 11 said “I have a dog myself and I’ve had dogs for a while, so I’m fairly confident.” Also, participant 5 commented “I think it [my confidence] comes from owning my own dog.”

Alternately, some participants expressed that they have a low level of confidence when talking to owners about dog walking. For example, participant 13 described “I’m less confident in talking about exercise than about nutrition…. I’m a little worried about my ability to promote it [dog walking] and to make specific safe recommendations.”

**Veterinarians’ Skills and Abilities** – When discussing skills and abilities, participants focused on their **knowledge to counsel about dog walking**. Most participants described that their professional veterinary education did not include talking to dog owners about dog walking. They discussed that their formal education did not provide the knowledge to discuss dog walking with dog owners or to make dog-walking recommendations. For instance, participant 16 described

“I don’t know if I have ever been taught about the right [dog walking] recommendations, about what [dog-walking recommendations] people are expecting or the benefits of such recommendations…. I would say formally in the education aspect, at least through four years of school, I have probably received very little [training on dog walking].”

Also, participant 7 said “I would say very little to no training on that [dog walking] in vet school, with the exception of how much to restrict it post certain surgeries, but not how to encourage it for general well-being.” Participant 14 commented “Being a fairly recent grad, we didn’t talk
about what level of exercise the pet needs and what we should be encouraging people to do. That was not really a discussion in school.”

Many participants described how their knowledge about dog walking comes from personal experience. They discussed that their personal experiences from owning a dog and their professional experience as a veterinarian both contribute to their knowledge on dog walking. For instance, participant 11 said “[My dog-walking knowledge] is all based on personal experience and what I have seen work in the past.” Additionally, Participant 4 stated “[My dog-walking knowledge] has all been based on my own experiences, talking to other people and I have a dog myself.”

Discussion

To our knowledge, this was the first study to explore veterinarians’ perceptions of and experiences with counselling about dog walking. The IMBP was used to examine specific constructs to better understand veterinarians’ behavior regarding dog-walking counselling. The findings of this study provides information regarding veterinarians’ approaches to discussing dog walking with dog owners, their beliefs about dog walking and their norms, barriers, self-efficacy, and skills and abilities related to talking to owners about this topic.

To summarize the qualitative study results, participants indicated that dog walking is not a standard discussion during veterinarian-client interactions. When dog walking was discussed with veterinary clients, three specific situations related to the dog’s physical condition, life stage and behaviour were identified. Participants believed that dog walking is an important part of dog ownership and identified three benefits of dog walking, specifically bonding, physical, social and mental benefits for the dog, and physical and social benefits for the owner. Participants perceived that other veterinarians discuss dog walking with owners in a similar capacity to
themselves. Veterinarians participating in the study also expressed that dog owners generally do not have expectations that their veterinarian talk with them about dog walking. Three barriers for veterinarians in counselling dog owners about dog walking were identified: owner-related barriers, dog-related barriers, and time/priority during appointments. The participants generally described having a high level of confidence regarding talking to dog owners, which they described came from their personal experiences of dog ownership. They discussed that their professional veterinary education generally did not include counselling dog owners about dog walking. They explained that their knowledge of dog walking comes from their personal experiences with dog ownership and their professional experiences as a veterinarian.

Participants said that dog walking was not a part of their standard discussion during veterinary appointments. Related to the physical condition of the dog, participants reported discussing dog walking when the dog presented as overweight or obese or when the dog has an illness or injury. This suggests that discussions of dog walking may be prompted by canine health conditions that may benefit from walking, as it can positively influence weight and assist in the recovery and treatment of illnesses and injuries. Regarding the dog’s life stage, participants reported discussing dog walking with the owners of puppies and older dogs. Participants were more inclined to talk about dog walking at these life stages because a dog’s exercise and walking needs change as they age and older dogs tend to be less active and more sedentary compared to younger dogs. Also, it is important for veterinarians to discuss and monitor walking and exercise patterns of puppies and older dogs to maintain health and reduce the risk of exercise-related injuries. Participants also described how they were more inclined to discuss dog walking when the dog exhibited behavioral issues. This is likely because dog walking can help prevent destructive behavior and reduce problem behaviors.
To address canine overweight and obesity, participants said they generally discuss reducing food and treat intake and increasing physical activity during visits by owners. This is supported by research that suggests that the main approaches to reducing obesity in companion animals are dietary management and increases in physical activity. Although exercise tends to not be as effective as food reduction, exercise is still an important part of a weight management plan because of the health benefits and maintenance of lean body mass. Also, participants discussed the importance of follow-up appointments to facilitate and monitor weight changes and provide support to owners. Other research supports this method, as follow-up appointments are important to monitor body weight and supervise the weight loss plan in overweight and obese dogs.

Participants discussed mutual benefits of dog walking for the dog and the owner, including bonding. Dog walking can enhance the health of both the dog and the owner by increasing their physical activity levels and it also presents an opportunity for the dog and owner to bond. Participants also mentioned that dog walking has physical, social and mental benefits for the dog. First, they identified weight management, weight loss, maintained functionality, disease-risk reduction and improvements to general health as some of the physical benefits of dog walking. These physical benefits for the dog are highlighted in other research which shows that dog walking can help promote weight loss and weight maintenance and improve physical activity level which, in turn, may help to reduce osteoarthritis and other diseases. Secondly, participants highlighted the social benefits of dog walking, which include social interactions with other dogs and other people. These benefits are supported by a report that suggests that dog walking encourages socialization and enjoyment which can enhance quality of life. Thirdly, participants discussed the mental benefits, specifically emphasizing
that dog walking can positively influence the dog’s behavior. This is reported in other research that indicates that dog walking can help reduce and prevent destructive behavior and aggressive behavior. Veterinarians can use this information and promote dog walking as a method to help dog owners reduce problem behaviors among their dogs.

Participants also described how dog walking can promote physical activity among owners. Research on the human benefits of dog walking suggests that dog walking can help owners be physically active and may assist them in meeting the daily physical activity recommendations. This is important because participants recognize the benefit of dog walking to the owner and they also have the opportunity to improve the health and well-being of humans through specific dog-walking counselling. This highlights the role that veterinarians have in enhancing the health of humans and animals alike and supports the One Health initiative through dog-walking counselling. Although participants recognize the mutual benefits of dog walking, the results suggest that this is not a reason that they discuss dog walking with owner. This is likely due to the many barriers to dog-walking counseling that they face, such as time constraints and priority in appointment, and that dog walking is only discussed in situations where it directly impacts the dog’s health (i.e., overweight and injury).

Additionally, participants in the current study commented that dog walking encourages dog owners to interact and develop relationships with other dogs and people. Other research supports this, as dog owners often meet, socialize and develop relationships with other pet owners while walking their dog. Veterinarians can use this information to promote dog walking as an opportunity for dog owners to meet other dog owners and to promote socialization in their community.
Participants in our sample perceived that other veterinarians discuss dog walking with dog owners. This is important because according to the IMBP, participants may be more likely to discuss dog walking if they perceive that other veterinarians do so as well. However, participants also perceived that dog owners do not have expectations that their veterinarian discuss dog walking. This may be because veterinarians have many responsibilities (e.g., giving vaccinations, administering medication and performing surgeries) and owners may not recognize or expect that veterinarians are responsible for providing information on exercise and dog walking. This lack of expectation from dog owners may deter discussions of dog walking. Veterinarians may be more inclined to have these discussions if owners are expecting to talk about dog walking during their appointments. Dog owners may not view dog walking as a physical activity for themselves or their dog, and veterinarians can play an important role in raising this awareness as they can promote dog walking as a form of exercise for both the dog and the owner. One way to increase these expectations would be for veterinarians to make owners aware that they are able to provide accurate recommendations and advice on dog walking.

Participants identified three of their own barriers when discussing dog walking with owners, namely owner-related barriers, dog-related barriers and time/priority in appointments. Specifically regarding owner-related barriers, participants identified that an owner’s busy schedule, their lack of compliance to dog-walking recommendations, and their physical condition were barriers when discussing dog walking. First, participants said that an owner’s busy schedule was a barrier. This is not surprising, as lack of time is a major barrier in general to dog walking that owners face, which can negatively affect their dog walking habits. Secondly, a lack of compliance to dog-walking recommendations is likely because there may be several
barriers to dog walking for owners (i.e., weather, dog’s behavior), and it may be difficult for veterinarians to address these barriers and positively influence dog-walking routines. Owners may also not understand the many benefits that dog walking has to the health and well-being of their pet, which may contribute to their lack of compliance. Thirdly, relating to the owner’s physical condition, participants specifically discussed that owners with a disability or who appear overweight or obese make discussions of dog walking challenging. Perhaps participants in this study may have viewed owners’ disability as a barrier because these conditions may impact their mobility and therefore potentially their ability to walk their dog. Also, perhaps participants perceived that owners without mobility issues may be more capable of walking their dog. This is supported by research that found that dog walkers scored higher on objective mobility measures, as they had faster normal and rapid walking speeds compared to non-dog walkers. Related to overweight and obesity, studies using objective and self-report measures of owners’ heights and weights showed that normal weight is associated with dog walking and that obese owners were less likely to walk their dog. This research suggests that a dog owner’s mobility and normal weight is positively associated with dog walking while dog-owner obesity is negatively associated with dog walking. It may therefore be difficult for veterinarians to discuss and promote dog walking among owners with a disability or who appear to be overweight or obese as they may be less likely to walk their dog. Veterinarians can use this information to recognize some of the barriers that they may face when talking to dog owners about dog walking and to identify strategies to overcome them and better promote dog walking. For example, to address an owner’s busy schedule, veterinarians may provide advice and tips to incorporate dog walking in their schedule. Also, to discuss dog walking with an owner with mobility issues, veterinarians can provide owners with alternative exercise suggestions (i.e., playing fetch, paid
dog walker) or with suggestions for shorter and more frequent walks. In regards to discussing
dog walking with obese clients, veterinarians can sensitively highlight the value of exercise to
the health and wellbeing of their pet to promote dog walking.

Participants described the dog’s behavior as a dog-related challenge when talking to dog
owners about dog walking, specifically inter-dog aggression and reactivity on a leash. This may
be expected because behavioral problems are a common barrier that dog owners face when
walking their dog and it can cause the owner to be nervous or hesitant, which can negatively
influence dog walking. The management of aggression toward other dogs and reactivity on
leash can also be complicated, which further supports that these issues can make discussions of
dog walking difficult for veterinarians. Although participants identified a dog’s behavior as a
barrier, they were more inclined to discuss dog walking when the dog had behavioral issues.
This suggests that they are discussing dog walking with owners of dogs with behavioral issues
regardless of the challenge that may be present. This may be because although there are some
situations which complicate dog walking (i.e., aggressive behavior) there are other situations
when dog walking is a solution (i.e., destructive behavior). It is therefore important for the
veterinarian to highlight the value of dog walking for both the animal and the owner and work
with the client or refer the client and their dog to work on behavioral modification.

Another barrier that participants identified was the time and priority during veterinary
appointments. They described that time constraints during appointments make conversations
about dog walking more challenging. Lack of available time has been identified as a barrier for
veterinarians when communicating with clients as it often prevents them from adequately
addressing client needs and expectations. Research involving other health professionals,
specifically physicians, suggests that having limited time in an appointment is a barrier when
providing physical activity counselling to patients.\textsuperscript{54, 59} Participants also stated that discussing dog walking with owners is sometimes a low priority. Similarly, among primary care providers, it was found that physical activity counselling is often not a priority during appointments and it is therefore not discussed.\textsuperscript{59} This barrier may be addressed by providing dog owners with resources and take-home handouts about dog walking. This strategy would highlight the importance of dog walking to health to provide the dog owner with information without utilizing a great amount of time in the appointment.

Regarding confidence in talking to owners about dog walking, most participants described having a high level of confidence that came from their own personal experience of dog ownership. Confidence is positively related to intention to perform behavior and veterinarians with higher levels of confidence related to dog-walking counselling may be more likely to discuss dog walking with owners.\textsuperscript{52} Additionally, participants in our study said that their professional veterinary education did not adequately teach them about talking to dog owners about dog walking. This may present an opportunity for veterinary colleges to incorporate more training to educate their students on dog-walking counselling and to highlight the positive impact that dog walking can have on human and animal health alike. They discussed having the skills and abilities to talk about dog walking through their own personal experiences with dog ownership and their professional experiences as a veterinarian. This is promising because possessing the skills and abilities to talk about dog walking may positively influence these discussions with owners.\textsuperscript{52} Although many participants identified that they had the skills and abilities to talk about dog walking, a few participants said that they did not possess these skills. Similar results have been found in other research on physical activity counselling, as low confidence\textsuperscript{58} and lack of knowledge or training\textsuperscript{54} have been identified as barriers to physical
activity counselling among primary care human healthcare providers. Many participants said they possessed the skills and abilities to discuss dog walking with dog owners which may be explained by the origin of the participants’ confidence levels and skills and abilities, which was from their past experiences with dog ownership and their professional experiences as practicing veterinarians. According to the IMBP, past behavior is a background variable that indirectly influences behavior. In the current study, participants’ past personal and professional experiences may positively influence their confidence and skills and abilities and therefore intention, and thus this highlights the role that these experiences may have on dog-walking counselling among practicing veterinarians. Despite the positive role that these experiences may have, not all veterinarians may have adequate personal and professional experiences to positively influence their counselling habits. It is therefore important to provide veterinarians with training and resources that may improve and maintain their levels of confidence and skills and abilities regarding talking to owners about dog walking. For example, continuing education could be used to educate veterinarians on the importance of dog walking and the dog-walking recommendations as well as to teach them about approaches to discussing it during veterinary appointments.

A strength of this study is that to our knowledge, this is the first study to examine veterinarians’ perceptions and behaviors regarding dog walking and dog-walking counselling. Another strength is the use of theory, specifically the IMBP, to structure the questions in the interview guide. The IMBP is a behavior change theory assisting in the prediction, understanding and modifying of behavior. The sample of 17 participants was small and was sampled from a limited geographical region in southern Ontario. However, despite the small sample size, data saturation was reached as no new data were uncovered and little to no changes
were made to the themes when the final transcripts were being analyzed. The sample size achieved in this study is supported by work suggesting that as few as 12 interviews may be required for data saturation. Additionally, a sample of 20 participants or less is advantageous when conducting thorough interviews to establish rapport and to gather comprehensive data. In addition, the use of random sampling in qualitative research can help reduce researcher bias in the selection of participants, which helps to enhance the credibility of the data. The sample was also relatively homogeneous, as the gender distribution in our sample was 94.1% females compared to 66.4% females in our sampling frame. Although our results may be more representative of the perceptions and behaviors of female veterinarians, this is consistent with the current trend seen in veterinary education where more females than males are attending veterinary college and are becoming veterinarians. It is therefore beneficial to understand female veterinarians’ perceptions of dog walking because the proportion of women entering in veterinary medicine is rapidly increasing and more women will represent the practicing veterinarians. In the current study, all participants graduated from the Ontario Veterinary College, which is not surprising as it is the only veterinary school in Ontario. Almost half of participants graduated between the years of 2010-2013 which suggests that our findings in this sample may be more reflective of recently trained veterinary veterinarians, and may perhaps more established veterinarians may have different perceptions and behaviors related to dog walking and dog-walking counselling. This study was conducted with currently practicing veterinarians in the field and our results reflect the current perceptions and behaviors of these participants related to dog walking and dog-walking counselling. With 33% of Canadian households owning a dog, our sample had much higher rates of dog ownership compared to the Canadian population. This is likely because our sample consisted of veterinarians, whose
careers are dedicated to maintaining and improving the lives of animals, and they may be more likely to own a pet compared to the average Canadian. Dog owners in the current sample reported walking their dog at a moderate-intensity level for an average of 3.6 days in the last 7 days and for 25.9 minutes on one of those days. Other research examining moderate-intensity level suggests that dog owners spend 78% of their time dog walking at a moderate-intensity for average of 21.7 minutes per day. This frequency and duration of moderate-intensity dog walking is higher than reported in the current sample. Over half of the participants in the current study were classified as highly active, and excluding walking, participants spent an average of 221 minutes engaged in moderate-vigorous activity per week. These results are not consistent with the finding that 15% of Canadian adults accumulate 150 minutes of moderate-vigorous activity per week. This difference in activity level suggests that our sample of veterinarians may be more active compared to Canadian adults. This may be explained by the high percentage of dog owners in the sample (88.2%) and dog owners being more physically active compared to non-dog owners. These differences in dog walking and physical activity levels suggests that veterinarians more physically active and walk their dog may have been more likely to volunteer to participate in this study.

Several other areas for future research are suggested. Future research should examine methods to overcome the barriers that veterinarians encounter when discussing dog walking with owners. Given the importance of physical activity to human and animal health and the low cost of dog walking as a form of physical activity, future research should explore ways to communicate the benefits of dog walking to owners and veterinarians to encourage this physical activity. Additional research may examine behaviors related to dog-walking counselling among
a larger, more diverse sample of veterinarians to better represent different geographical regions as well as veterinarians in general.

The results of this study have theoretical and practical implications. Regarding theoretical implications, this study examined veterinarians’ perceptions of and experiences with counselling about dog walking using constructs from the IMBP. This theory served as a good guide in identifying constructs to help understand veterinarians’ perceptions and experiences with dog-walking counselling.

Regarding practical implications, the results can be used to increase and improve the discussions that veterinarians have with owners about dog walking. Participants disclosed barriers to talking to owners about dog walking and identified specific factors that may discourage these discussions. First, veterinarians may use this information to recognize and overcome some of the barriers to discussing dog walking with owners. By recognizing and possibly overcoming some of these barriers related to dog-walking counselling, veterinarians may be able to better promote dog walking among owners in veterinary appointments.52 Secondly, this study also highlights many benefits of dog walking that veterinarians recognize, which can be used to increase awareness of the benefits of dog walking among veterinarians. By increasing veterinarians’ awareness of the benefits of dog walking, they may be more likely to have these discussions.52 Thirdly, veterinarians can make owners aware that they are able to provide accurate advice and dog-walking recommendations to increase these owners’ expectations. If owners expect their veterinarian to discuss dog walking with them, veterinarians may be more inclined to have these discussions during veterinary appointments.52

The results from this study suggest that discussions of dog walking may be improved if veterinarians identify and reduce the barriers they face, by increasing veterinarians’ awareness of
the benefits of dog walking, and by increasing owner expectations. By improving veterinarians’ discussions of dog walking during veterinary appointments, dog owners may be more likely to walk their dogs. This is important because veterinarians have the opportunity to discuss dog walking with owners, they may be able to positively influence dog walking, and they are likely treating dogs and meeting with owners that may benefit from dog walking.

It is important that veterinarians discuss dog walking with owners for several reasons. First, veterinarians have the opportunity to discuss dog walking during veterinary appointments because the average dog visits the veterinarian 2.6 times per year with research showing 77% of dog owners have brought their dog to the veterinarian in the past year, presenting an opportunity for veterinarians to promote dog walking. Secondly, it is important for veterinarians to discuss dog walking with owners because they are able to positively influence dog walking through specific exercise counselling with benefits to both the dog and owner. Thirdly, veterinarians may be treating dogs that would benefit from dog walking, for example, overweight dogs and those with an injury or illness.
Footnotes


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Table 1. Demographic characteristics of the sample (n=17)

<table>
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<tbody>
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<td>Gender</td>
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<td>Female</td>
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<td>Veterinary college attended</td>
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<td>2002-2005</td>
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</tr>
<tr>
<td>2006-2009</td>
<td>2 (11.8)</td>
</tr>
<tr>
<td>2010-2013</td>
<td>8 (47.1)</td>
</tr>
<tr>
<td>Owns a dog</td>
<td>15 (88.2)</td>
</tr>
</tbody>
</table>
Note. Percentages may not add up to 100 due to rounding.
Table 2. Dog-walking patterns among dog owning veterinarians participating in the study (n=15)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean (SD) or % Median (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk their dog</td>
<td>100</td>
</tr>
<tr>
<td>Average amount of dog walking during the last 7 days*</td>
<td></td>
</tr>
<tr>
<td>Days of dog walking</td>
<td>4.6 (2.4) 6.0 (6.0)</td>
</tr>
<tr>
<td>Time spent dog walking on a typical day (minutes)</td>
<td>40.3 (21.3) 30.0 (70.0)</td>
</tr>
<tr>
<td>Average amount of moderate-intensity dog walking during the last 7 days†</td>
<td></td>
</tr>
<tr>
<td>Days of moderate-intensity dog walking</td>
<td>3.6 (2.7) 4.5 (7.0)</td>
</tr>
<tr>
<td>Time spent in moderate-intensity dog walking on a typical day (minutes)</td>
<td>25.9 (15.2) 30.0 (45.0)</td>
</tr>
</tbody>
</table>

*Refers to dog walking in minimum bouts of 10-minute bouts.
† Moderate-intensity dog walking refers to dog walking that takes moderate physical effort and makes the owner breathe somewhat harder than normal. Refers only to bouts of ≥ 10 minutes.
Table 3. IPAQ-SF scores for 17 veterinarians licenced to practice in Southern Ontario (n=17)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean (SD) or % Median (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average amount of walking during the last 7 days*</td>
<td></td>
</tr>
<tr>
<td>Days of walking</td>
<td>5.1 (2.5) 7.0 (7.0)</td>
</tr>
<tr>
<td>Time spent walking on a typical day (minutes)</td>
<td>53.2 (59.7) 45.0 (270.0)</td>
</tr>
<tr>
<td>1-15 minutes</td>
<td>6.3</td>
</tr>
<tr>
<td>16-30 minutes</td>
<td>37.5</td>
</tr>
<tr>
<td>31-60 minutes</td>
<td>43.8</td>
</tr>
<tr>
<td>&gt; 60 minutes</td>
<td>12.5</td>
</tr>
<tr>
<td>Average amount of moderate-intensity physical activity during the last 7 days †</td>
<td></td>
</tr>
<tr>
<td>Days of moderate-intensity physical activity</td>
<td>3.5 (2.7) 4.0 (7.0)</td>
</tr>
<tr>
<td>Time spent in moderate-intensity physical activity on a typical day (minutes)</td>
<td>31.2 (22.9) 30.0 (75.0)</td>
</tr>
<tr>
<td>Average amount of vigorous-intensity physical activity during the last 7 days ‡</td>
<td></td>
</tr>
<tr>
<td>Days of vigorous-intensity physical activity</td>
<td>2.8 (1.9) 2.0 (6.0)</td>
</tr>
<tr>
<td>Time spent in vigorous-intensity physical activity on a typical day (minutes)</td>
<td>39.9 (25.3) 30.0 (90.0)</td>
</tr>
<tr>
<td>IPAQ-SF</td>
<td></td>
</tr>
<tr>
<td>Low §</td>
<td>17.6</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td>High ¶</td>
<td>52.9</td>
</tr>
</tbody>
</table>
Average amount of sitting per day during the last 7 days

| Time spent sitting per day (hours) | 4.3 (2.6) 4.0 (11.0) |

Note. Percentages may not add up to 100 due to rounding.

* Time spent walking in the last 7 days in bouts of ≥ 10 minutes.

† Moderate activities refers to activities that take moderate physical effort and that make a person breathe somewhat harder than normal. Refers to minimum bouts of 10 minutes.

‡ Vigorous activities refer to activities that take hard physical effort and make a person breathe much harder than normal. Refers to minimum bouts of 10 minutes.

§ An individual is classified into a low activity level if they do not meet the criteria outlined in the moderate or high levels of activity.

|| An individual is classified into a moderate activity level if they engage in: (a) 3 or more days of vigorous-intensity activity for at least 20 minutes per day, or (b) 5 or more days of moderate-intensity activity and/or walking for at least 30 minutes per day, or (c) 5 or more days of any combination of walking, moderate-intensity activity or vigorous intensity-activity reaching a minimum total physical activity of at least 600 MET-minutes/week.

¶ An individual is classified into a high activity level if they engage in: (a) vigorous intensity activity on at least 3 days achieving a minimum physical activity of at least 1500 MET-minutes/week or (b) 7 or more days of any combination of walking, moderate-intensity activity or vigorous-intensity activity achieving a minimum total physical activity of at least 3000 MET-minutes/week.
<table>
<thead>
<tr>
<th>Theoretical construct</th>
<th>Interview question(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>1. Can you tell me about your approach to talking to clients about dog walking?</td>
</tr>
<tr>
<td></td>
<td>2. I appreciate that this can be challenging as a veterinarian, but I am interested in how you have advised dog owners with overweight or obese dogs. Can you tell me about the advice or counselling you have given to the owner of an overweight or obese dog?</td>
</tr>
<tr>
<td>Attitudes</td>
<td>3. In your opinion, is it important for owners to walk their dogs?</td>
</tr>
<tr>
<td></td>
<td>4. Can you tell me about some of the benefits of dog walking?</td>
</tr>
<tr>
<td>External barriers</td>
<td>5. What are some of the challenges you may face when discussing dog walking with clients?</td>
</tr>
<tr>
<td></td>
<td>6. Can you tell me about some of the circumstances or situations where you may feel uncomfortable or hesitant to</td>
</tr>
</tbody>
</table>
discuss dog walking with clients?

7. Are there any circumstances where you would be more inclined to discuss dog walking with clients?

Norms
(of dog owners and other veterinarians)

8. Do you think other veterinarians promote or discuss dog walking with their clients?

9. In the veterinary profession, what do you feel are the expectations of you to discuss dog walking with dog owners?

Self-efficacy

10. Can you tell me about your confidence in discussing dog walking with dog owners?

11. Can you tell me more about where this confidence comes from?

Skills and abilities

12. Can you tell me about some of the training that you may have received regarding counselling dog owners on dog walking?
Chapter 5.0 References


Christian, H., Giles-Corti, B., & Knuiman, M. (2010). "I'm just a'-walking the dog" correlates of regular dog walking. *Family & Community Health, 33*(1), 44-52. doi:10.1097/FCH.0b013e3181e4e208; 10.1097/FCH.0b013e3181c4e208


120


123


Appendix A: Background and Demographic Information Questionnaire for Face-to-Face Interviews

Demographic and Background Information Questionnaire

Please complete the following questions.

1. Name:

2. Sex: Male Female Other

3. Year of graduation from veterinary college:

4. What veterinary college did you graduate from?

5. Do you own a dog(s)?

   Yes - PROCEED TO QUESTION 6  No – The questionnaire is now complete.  Thank you for your participation!

The following questions have been adapted from the IPAQ- Short Last 7 Days Self-Administered Format and will be used to get a sense of how often and for how long you walk your dog (IPAQ, 2002).
6. Do you walk your dog?

Yes

No → The questionnaire is now complete. Thank you for your participation.

Think about the time you spent walking your dog in the last 7 days.

7. During the last 7 days, on how many days did you walk your dog for at least 10 minutes at a time?

_____ days per week

☐ No dog walking → The questionnaire is now complete. Thank you for your participation.

6. How much time did you usually spend walking your dog on one of those days?

_____ hours per day

_____ minutes per day

☐ Don’t know/Not sure

Think about all the moderate dog walking that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about when you walked your dog for at least 10 minutes at a time.

7. During the last 7 days, on how many days did you engage in moderate dog walking?

_____ days per week

☐ No moderate dog walking → The questionnaire is now complete. Thank you for your participation.

8. How much time did you usually spend engaging in moderate dog walking on one of those days?

_____ hours per day

_____ minutes per day

☐ Don’t know/Not sure

The questionnaire is now complete. Thank you for your participation.
Appendix B: Background and Demographic Information Questionnaire for Telephone Interviews

Part A:

Script:

1. “What is your full name?”
2. “What is your sex?” Male Female Other

Script:

3. “What year did you graduate from veterinary college?”
4. “What veterinary college did you graduate from?”

5. “Do you own a dog(s)?”

Yes - PROCEED TO PART B

No – “The questionnaire is now complete. Thank you for your participation!”

Part B:

Script:

“The following questions have been adapted from the IPAQ-Short Last 7 Days Telephone Format and will be used to get a sense of how often and for how long you may walk your dog (IPAQ, 2002).

1. Do you walk your dog?

   Yes

   No — The questionnaire is now complete. Thank you for your participation.

READ: Now think about the time you spent walking your dog in the last 7 days.
2. During the last 7 days, on how many days did you walk your dog for at least 10 minutes at a time?
   _____ days per week [WDAY; Range: 0-7, 8, 9]

8. Don’t know/Not Sure
9. Refused

[Interviewer clarification: Think only about the dog walking that you do for at least 10 minutes at a time.]

[Interviewer Note: If respondent answers zero, refuses, or does not know, the questionnaire is now complete. READ: The questionnaire is now complete. Thank you for your participation.]

3. How much time did you usually spend walking your dog on one of those days?
   _____ hours per day [WDHRS; Range: 0-16]
   _____ minutes per day [WDMIN; Range: 0-960, 998, 999]
   9998. Don’t know/Not sure
   9999. Refused

[Interviewer probe: An average time for one of the days on which you walk your dog is being sought. If the respondent can’t answer because the pattern of time varies widely from day to day, ask: “What is the total amount of time you spent walking your dog over the last 7 days?”

   _____ hours per week [WWHRS; Range: 0-112]
   _____ minutes per week [WWMIN; Range: 0-6720, 9998, 9999]
   9998. Don’t know/Not sure
   9999. Refused

READ: Now think about the dog walking which takes moderate physical effort that you did in the last 7 days. Moderate physical activities make you breathe somewhat harder than normal. Think only about when you walked your dog for at least 10 minutes at a time.

4. During the last 7 days, on how many days did you engage in moderate dog walking?
   _____ days per week [MDAY; Range: 0-7, 8, 9]
   8. Don’t know/Not sure
   9. Refused

[Interviewer clarification: Think only about the dog walking that you do for at least 10 minutes at a time.]

[Interviewer Note: If respondent answers zero, refuses, or does not know, the questionnaire is now complete. READ: The questionnaire is now complete. Thank you for your participation.]
5. How much time did you usually spend engaging in moderate dog walking on one of those days?

_____ hours per day [MDHRS; Range:0-16]

_____ minutes per day [MDMIN; Range: 0-960, 998, 999]

998. Don’t know/Not sure

999. Refused

[Interviewer clarification: Think only about the dog walking that you do for at least 10 minutes at a time.]

[Interviewer probe: An average time for one of the days on which you engage in moderate dog walking is being sought. If the respondent can’t answer because of the pattern of time spent varies from day to day, ask: “What is the total amount of time you spent over the last 7 days engaging in moderate dog walking?”

_____ hours per week [MWHRS; Range: 0-112]

_____ minutes per week [MWMIN; Range: 0-6720, 9998, 9999]

9998. Don’t know/Not sure

9999. Refused

The questionnaire is now complete. Thank you for your participation.
We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

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

   ____ days per week
   □ No vigorous physical activities  →  Skip to question 3

2. How much time did you usually spend doing vigorous physical activities on one of those days?

   ____ hours per day
   ____ minutes per day
   □ Don’t know/Not sure

Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

   ____ days per week
   □
4. How much time did you usually spend doing moderate physical activities on one of those days?

____ hours per day
____ minutes per day
☐ Don’t know/Not sure

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

____ days per week
☐ No walking  Skip to question 7

9. How much time did you usually spend walking on one of those days?

____ hours per day
____ minutes per day
☐ Don’t know/Not sure

The last question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

10. During the last 7 days, how much time did you spend sitting on a week day?

____ hours per day
____ minutes per day
☐ Don’t know/Not sure
This is the end of the questionnaire, thank you for participating.
Appendix D: IPAQ Short Last 7 Days Telephone Format for Telephone Interviews

Short Last 7 Days Telephone IPAQ

READ: I am going to ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

READ: Now, think about all the vigorous activities which take hard physical effort that you did in the last 7 days. Vigorous activities make you breathe much harder than normal and may include heavy lifting, digging, aerobics, or fast bicycling. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do vigorous physical activities?
   _____ Days per week [VDAY; Range 0-7, 8, 9]
   8. Don't Know/Not Sure
   9. Refused

   [Interviewer clarification: Think only about those physical activities that you do for at least 10 minutes at a time.]

   [Interviewer note: If respondent answers zero, refuses or does not know, skip to Question 3.]

2. How much time did you usually spend doing vigorous physical activities on one of those days?
   __ __ Hours per day [VDHRS; Range: 0-16]
   __ __ __ Minutes per day [VDMIN; Range: 0-960, 998, 999]
   998. Don't Know/Not Sure
   999. Refused

   [Interviewer clarification: Think only about those physical activities you do for at least 10 minutes at a time.]
Interviewer probe: An average time for one of the days on which you do vigorous activity is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: "How much time in total would you spend over the last 7 days doing vigorous physical activities?"

__ __ Hours per week [VWHRS; Range: 0-112]

__ __ __ __ Minutes per week [VWMIN; Range: 0-6720, 9998, 9999]

9998. Don't Know/Not Sure

9999. Refused

READ: Now think about activities which take *moderate physical effort* that you did in the last 7 days. Moderate physical activities make you breathe somewhat harder than normal and may include carrying light loads, bicycling at a regular pace, or doubles tennis. Do not include walking. Again, think about only those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities?

_____ Days per week [MDAY; Range: 0-7, 8, 9]

8. Don't Know/Not Sure

9. Refused

[Interviewer clarification: Think only about those physical activities that you do for at least 10 minutes at a time.]

[Interviewer Note: If respondent answers zero, refuses or does not know, skip to Question 5.]

4. How much time did you usually spend doing moderate physical activities on one of those days?

__ __ Hours per day [MDHRS; Range: 0-16]

__ __ __ Minutes per day [MDMIN; Range: 0-960, 998, 999]

998. Don't Know/Not Sure

999. Refused

[Interviewer clarification: Think only about those physical activities that you do for at least 10 minutes at a time.]
[Interviewer probe: An average time for one of the days on which you do moderate activity is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, or includes time spent in multiple jobs, ask: “What is the total amount of time you spent over the last 7 days doing moderate physical activities?”

_ _ _ _ Hours per week [MWHRS; Range: 0-112]

_ _ _ _ Minutes per week [MWMIN; Range: 0-6720, 9998, 9999]

9998. Don't Know/Not Sure

9999. Refused

READ: Now think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

_ _ Days per week [WDAY; Range: 0-7, 8, 9]

8. Don't Know/Not Sure

9. Refused

[Interviewer clarification: Think only about the walking that you do for at least 10 minutes at a time.]

[Interviewer Note: *If respondent answers zero, refuses or does not know, skip to Question 7.*]

6. How much time did you usually spend walking on one of those days?

_ _ Hours per day [WDHRS; Range: 0-16]

_ _ _ _ Minutes per day [WDMIN; Range: 0-960, 998, 999]

998. Don't Know/Not Sure

999. Refused

[Interviewer probe: An average time for one of the days on which you walk is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: “What is the total amount of time you spent walking over the last 7 days?”

_ _ _ _ Hours per week [WWHRS; Range: 0-112]
READ: Now think about the time you spent sitting on week days during the last 7 days. Include time spent at work, at home, while doing course work, and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television.

7. During the last 7 days, how much time did you usually spend sitting on a week day?
   _ _ _ Hours per weekday [SDHRS; 0-16]
   _ _ _ Minutes per weekday [SDMIN; Range: 0-960, 998, 999]

   998. Don't Know/Not Sure
   999. Refused

[Interviewer clarification: Include time spent lying down (awake) as well as sitting.]

[Interviewer probe: An average time per day spent sitting is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask: “What is the total amount of time you spent sitting last Wednesday?”]

   _ _ _ Hours on Wednesday [SWHRS; Range 0-16]
   _ _ _ Minutes on Wednesday [SWMIN; Range: 0-960, 998, 999]

   998. Don't Know/Not Sure
   999. Refused

This is the end of the questionnaire, thank you for participating.
Dear Dr. ________________,

My name is Kathleen Burns and I am a Masters of Science candidate in the Family Relations and Applied Nutrition (FRAN) department at the University of Guelph. I am a member of a research team of individuals from FRAN and the Ontario Veterinary College at the University of Guelph. For our pilot study, “Understanding Veterinarians’ Perceptions of Dog Walking”, I am interested in talking to veterinarians about their perceptions of dog walking and about their experiences and challenges regarding counselling clients on dog walking. I am recruiting veterinarians to participate in a pilot study to answer interview questions and give their feedback on these questions. I would like to get in touch with you to inquire about participating in the study. I will be following up with a phone call in about a week. If you have any questions, please do not hesitate to contact me.

Sincerely,

Kathleen Burns

Kathleen Burns, BASc (MSc. Candidate)  Dr. John Dwyer, PhD (Principal Investigator)  Dr. Jason Coe, DVM (Co-Investigator)
Phone: 519-807-5891  Phone: 519-824-4120  Phone: 519-824-4120
Email: kburns02@uoguelph.ca  Email: dwyer@uoguelph.ca  Email: jcoe@uoguelph.ca
Appendix F: Pilot Study Recruitment Phone Script

“Hi, my name is Kathleen Burns and I am a Masters of Science candidate in the Family Relations and Applied Nutrition (FRAN) department at the University of Guelph. I am following up on a letter I sent Dr. _______ last week. I am a member of a research team of individuals from FRAN and the Ontario Veterinary College at the University of Guelph. For our study, “Understanding Veterinarians’ Perceptions of Dog Walking”, I am interested in talking to veterinarians about their perceptions of dog walking and about their experiences and challenges regarding counselling clients on dog walking. I am recruiting veterinarians to participate in a pilot study to answer interview questions and give their feedback on the questions. I would like to get in touch with Dr. _______ at your clinic to inquire about participating in the study. Is there a time I could call back to get in touch with her/him? My phone number is 519-807-5891 and my email is kburns02@uoguelph.ca.”
Appendix G: Consent to Participate in Pilot Research

CONSENT TO PARTICIPATE IN RESEARCH

“Pilot Study: Understanding Veterinarians’ Perceptions of Dog Walking”

You are asked to participate in a research study conducted by Kathleen Burns (MSc. Candidate) and Dr. John Dwyer (Principal Investigator), from the Department of Family Relations and Applied Nutrition (FRAN) and Dr. Jason Coe (Co-Investigator) from the Ontario Veterinary College at the University of Guelph. The results from your participation will be used for Kathleen Burns’ Masters of Applied Human Nutrition thesis.

PURPOSE OF THE STUDY

The purpose of this study is to get your feedback on interview questions for a study designed to understand veterinarians’ perceptions about dog walking and their experiences with counselling clients on dog walking. These interview questions will then be revised based on this feedback.

If you have any questions or concerns about the research, please feel free to contact me (Kathleen Burns):

Kathleen Burns  Dr. John Dwyer, PhD  Dr. Jason Coe, DVM
(MSc. Candidate)  (Principal Investigator)  (Co-Investigator)
Phone:  Phone:  Phone: 519-824-4120 519-824-4120 519-824-4120
519-807-5891  Ext. 52210  Ext. 54010
Email:  Email:  Email:
kburns02@uoguelph.ca  dwyer@uoguelph.ca  jcoe@uoguelph.ca

INCLUSION CRITERIA

You are eligible to participate in this research project if you are a practicing veterinarian providing veterinary care for dogs in Ontario.
PROCEDURES

Your participation will involve meeting with the student researcher for a semi-structured interview. The total time commitment for your participation in this study is 55-70 minutes. First, you will be asked to review and sign this consent form.

Second, you will be asked to participate in a one-on-one, face-to-face interview with the researcher. The interview will be approximately 30-45 minutes in length. You will only be asked to participate in a single interview at a location convenient for you. The interview will be audio-recorded using two recording devices and will later be transcribed by the researcher and two undergraduate thesis students.

Next, after participation in the face-to-face interview, you will be asked to fill out a questionnaire to assess your physical activity level. You will then complete a background questionnaire that will ask for your name, sex, year of graduation from veterinary college, which veterinary college you attended, whether you own a dog, and how often and for how long you walk your dog (if you own a dog). Combined, both of these questionnaires will take approximately 5 minutes to complete.

You will be asked to share your thoughts about the interview questions. This will take approximately 10 minutes, and will involve sharing any concerns or ideas you may have about the questions to improve them. You will also be asked after the interview if you would like to be re-contacted in the future regarding sharing information about the study with other veterinarians, in the event that we want to recruit more veterinarians. You will then sign a form and will be provided with an information sheet if you choose to be re-contacted.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

Your feedback will be used to revise interview questions to conduct the main study. The main study addresses the gap in the research regarding dog walking counselling among veterinarians. The findings from this study may be used to better understand dog walking counselling and the challenges that veterinarians may face, possibly benefiting the veterinary community.

PAYMENT FOR PARTICIPATION

You will be provided with a gift card for Starbucks for the amount of $20 as a token of appreciation for your participation.

You will be required to sign a participant compensation form to ensure you have received the $20 gift card token of appreciation.
CONFIDENTIALITY

Every effort will be made to ensure confidentiality of any identifying information that is obtained in connection with this study.

All data generated during this study will remain confidential. The interview will be audio-recorded and transcribed for accuracy.

Two undergraduate thesis students in the Applied Human Nutrition program will be assisting the researcher with transcription and analysis of the interviews. They will not have access to the names of the participants. Instead, they will only have access to the participant number that will be assigned to each participant. The master list of names and assigned participant numbers will be kept under lock and key in either Dr. John Dwyer’s filing cabinet in his office or in his filing cabinet in the Applied Human Nutrition graduate student office. Your name will not appear in any research reports and only Dr. John Dwyer and Kathleen Burns will have access to names, sex, year of graduation, and veterinary college graduated from.

The researcher and undergraduate thesis students will have their laptops encrypted for this study. The researcher and undergraduate students will transcribe the interviews on the encrypted laptops. Encryption ensures that the transcribed documents are unreadable without the proper passwords. After each interview, the audio recordings will be saved on the researcher’s encrypted laptop and will be deleted from the audio-recording device. The transcribed audio recordings will be saved as an encrypted file.

It is important to have access to the transcripts and participant numbers for publication purposes. This information will be kept 5 years after the research findings are published. This stored information will not be identifying and will be kept under lock and key at the University of Guelph campus for 5 years after the results of the study are published. Written transcripts of the interviews will also be saved in an encrypted file. After this 5 year period, hard copies of these documents will be shredded. The electronic transcripts from the interviews will be permanently deleted.

DISSEMINATION

The results of this study will be published in Kathleen Burns’ Masters Thesis and submitted for possible publication in journals. Dr. John Dwyer may also use the data for teaching purposes.

PARTICIPATION AND WITHDRAWAL
Your participation in this study is completely voluntary. You may refuse to participate, refuse to answer any questions and still remain in the study, or you may withdraw from the study at any time without any consequences. The researcher may withdraw you from this research if circumstances arise that warrant doing so. If you complete the interview, you have 3 days to withdraw from the study by requesting your data be permanently destroyed.

RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Guelph Research Ethics Board.

If you have questions regarding your rights as a research participant, contact:

Sandra Auld, Director, Research Ethics, University of Guelph, reb@uoguelph.ca, 519-824-4120

SIGNATURE OF RESEARCH PARTICIPANT

I have read the information provided for the pilot study “Understanding Veterinarians’ Perceptions of Dog Walking” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

______________________________________
Name of Participant (please print)

______________________________________   ____________________
Signature of Participant      Date

SIGNATURE OF WITNESS

______________________________________
Appendix H: Pilot Study Feedback Questionnaire

“Thank you very much for your participation in this pilot study.

1. Were there any questions that seemed unclear in this interview?
   a. Can you tell me which questions these are?
   b. Do you have any thoughts on how to improve these questions?
   c. Are there any additional questions you felt were unclear in this interview?
2. Do you have any additional feedback on the interview questions?
3. Do you have any additional feedback on the interview process?

Thank you again for your time. Your participation in this pilot study is greatly appreciated.”
Thank you for your participation in this study. Your involvement is greatly appreciated.

If you know of any other veterinarians who may be interested in participating in this study, would you mind sharing the information about this study with them?

Yes No

If you select yes, in the event you are re-contacted please have these veterinarians contact me by phone or email to take part in an interview. (Give the veterinarian the Study Information Sheet).

Your time is greatly appreciated. Thank you again for your participation.
<table>
<thead>
<tr>
<th>Research Objective</th>
<th>Theoretical Construct</th>
<th>Question(s)</th>
<th>Prompt(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To determine the behaviour of veterinarians, specifically whether they counsel their clients on dog-</td>
<td>Behaviour</td>
<td>Can you tell me about your approach to talking to clients about dog walking?</td>
<td>Can you tell me more about your approach to discussing dog walking with clients?</td>
</tr>
<tr>
<td>walking in veterinary appointments.</td>
<td></td>
<td></td>
<td>In a routine appointment for a dog, do you discuss dog walking with these clients?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Can you tell me more about this?</td>
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<td></td>
<td></td>
<td></td>
<td>What do you discuss with your clients about dog walking?</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Do you discuss a specific frequency, duration or intensity?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[If they do not discuss dog walking with clients] Can you share why you don’t discuss dog walking in these appointments?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[If they have provided owners of overweight or obese dogs with advice] Are you more likely or less likely to discuss dog walking with an owner of an obese dog?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Can you tell me more about this?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>What would you</td>
</tr>
<tr>
<td>Research Objective</td>
<td>Theoretical Construct</td>
<td>Question(s)</td>
<td>Prompt(s)</td>
</tr>
<tr>
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</tr>
<tr>
<td>To examine the attitudes (including behavioural beliefs and outcome evaluations) toward dog walking and dog walking counselling among veterinarians.</td>
<td>Attitudes</td>
<td>In your opinion, is it important for owners to walk their dogs?</td>
<td>What are your thoughts about getting humans physically active with their dogs? Can you tell me more about your thoughts on this?</td>
</tr>
<tr>
<td></td>
<td>a) Behavioural Beliefs</td>
<td>Can you tell me about some of the benefits of dog walking?</td>
<td>Can dog walking benefit the health of the owner? Can you tell me more about your thoughts?</td>
</tr>
<tr>
<td></td>
<td>b) Outcome Evaluations</td>
<td>Can you tell me more about these benefits?</td>
<td>Can you tell me more about that?</td>
</tr>
<tr>
<td>To examine the external barriers veterinarians face to counselling clients on</td>
<td>Environmental Factors</td>
<td>What are some of the challenges you may face when discussing dog walking with</td>
<td></td>
</tr>
<tr>
<td>Research Objective</td>
<td>Theoretical Construct</td>
<td>Question(s)</td>
<td>Prompt(s)</td>
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</tr>
<tr>
<td>dog walking.</td>
<td></td>
<td>clients?</td>
<td>Can you tell me more about your hesitancy in these situations?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can you tell me about some of the circumstances or situations where you may feel uncomfortable or hesitant to discuss dog walking with clients?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can you tell me more about these situations?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Are there any circumstances where you would be more inclined to discuss dog walking with clients?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can you tell me more about these situations?</td>
<td></td>
</tr>
<tr>
<td>To examine norms (including injunctive and descriptive normative beliefs) regarding dog walking and dog walking counselling.</td>
<td>Norms: a) Descriptive Norms</td>
<td>Do you think other veterinarians promote or discuss dog walking with their clients?</td>
<td>Tell me more about your thoughts on this.</td>
</tr>
<tr>
<td></td>
<td>Norms: b) Injunctive Norms</td>
<td>In the veterinary profession, what do you feel are the expectations of you to discuss dog walking with dog owners?</td>
<td>Can you tell me more about these expectations?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can you tell me about the expectations your clients may have of you to discuss dog walking with them?</td>
<td>Tell me more about these expectations.</td>
</tr>
<tr>
<td>Research Objective</td>
<td>Theoretical Construct</td>
<td>Question(s)</td>
<td>Prompt(s)</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| To examine self-efficacy regarding dog walking counselling among veterinarians. | Self-Efficacy | Can you tell me about your confidence in discussing dog walking with dog owners?  
Can you tell me more about where this confidence comes from? | Can you expand on why you feel this way?                                      |
| To examine the skills and abilities required to counsel clients on dog walking as a veterinarian. | Skills and Abilities | Can you tell me about some of the training you may have received regarding counselling dog owners on dog walking?  
Can you tell me more about this training?  
Do you have access to resources on dog walking? | [If answered yes] Can you tell me about the content of this/these resource(s)?  
[If answered no] Would you be interested in a resource on dog walking? There is a resource I can share with you. |
Appendix K: Research Ethics Board Certification

RESEARCH ETHICS BOARDS
Certification of Ethical Acceptability of Research Involving Human Participants

<table>
<thead>
<tr>
<th>APPROVAL PERIOD:</th>
<th>November 20, 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXPIRY DATE:</td>
<td>November 20, 2015</td>
</tr>
<tr>
<td>REB:</td>
<td>G</td>
</tr>
<tr>
<td>REB NUMBER:</td>
<td>14OC044</td>
</tr>
<tr>
<td>TYPE OF REVIEW:</td>
<td>Delegated Type 1</td>
</tr>
<tr>
<td>PRINCIPAL INVESTIGATOR:</td>
<td>Dwyer, John (<a href="mailto:dwyer@uoguelph.ca">dwyer@uoguelph.ca</a>)</td>
</tr>
<tr>
<td>DEPARTMENT:</td>
<td>Family Relations &amp; Applied Nutrition</td>
</tr>
<tr>
<td>SPONSOR(S):</td>
<td>N/A</td>
</tr>
<tr>
<td>TITLE OF PROJECT:</td>
<td>Veterinarians' Perceptions of Dog Walking.</td>
</tr>
</tbody>
</table>

The members of the University of Guelph Research Ethics Board have examined the protocol which describes the participation of the human participants in the above-named research project and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement, 2nd Edition.

The REB requires that researchers:
- Adhere to the protocol as last reviewed and approved by the REB.
- Receive approval from the REB for any modifications before they can be implemented.
- Report any change in the source of funding.
- Report unexpected events or incidental findings to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants, and the continuation of the protocol.
- Are responsible for ascertaining and complying with all applicable legal and regulatory requirements with respect to consent and the protection of privacy of participants in the jurisdiction of the research project.

The Principal Investigator must:
- Ensure that the ethical guidelines and approvals of facilities or institutions involved in the research are obtained and filed with the REB prior to the initiation of any research protocols.
- Submit a Status Report to the REB upon completion of the project. If the research is a multi-year project, a status report must be submitted annually prior to the expiry date. Failure to submit an annual status report will lead to your study being suspended and potentially terminated.

The approval for this protocol terminates on the EXPIRY DATE, or the term of your appointment or employment at the University of Guelph whichever comes first.

Signature: [Signature]
Date: November 20, 2014

L. Kuwatsuki
Chair, Research Ethics Board, Guelph
Appendix L: Study Information Sheet for Snowball Sampling

Research Study: “Understanding Veterinarians’ Perceptions of Dog Walking”

My name is Kathleen Burns and I am a Masters of Science candidate in the Family Relations and Applied Nutrition (FRAN) department at the University of Guelph. I am a member of a research team of individuals from FRAN and the Ontario Veterinary College at the University of Guelph. For our study, “Understanding Veterinarians’ Perceptions of Dog Walking”, I am interested in talking to veterinarians about their perceptions of dog walking and about their experiences and challenges regarding counselling clients on dog walking. I would like to get in touch with you to inquire about participating in the study. If you are interested, please feel free to contact me via email or phone. If you have any questions, please do not hesitate to contact me.

Sincerely,

Kathleen Burns

Kathleen Burns, BASc.  Dr. John Dwyer, PhD  Dr. Jason Coe, DVM
(MSc. Candidate)  (Principal Investigator)  (Co-Investigator)
Phone: 519-807-5891  Phone: 519-824-4120  Phone: 519-824-4120
Ext. 52210  Ext. 54010
Email: kburns02@uoguelph.ca  Email: dwyer@uoguelph.ca  Email: jcoe@uoguelph.ca
Appendix M: Main Study Research Information Letter for Mail

Date

Dear Dr. ,

My name is Kathleen Burns and I am a Masters of Science candidate in the Family Relations and Applied Nutrition (FRAN) department at the University of Guelph. I am a member of a research team of individuals from FRAN and the Ontario Veterinary College at the University of Guelph. For our study, “Understanding Veterinarians’ Perceptions of Dog Walking, I am interested in talking to veterinarians about their perceptions of dog walking and about their experiences and challenges regarding counselling clients on dog walking. I would like to get in touch with you to inquire about participating in the study. I will be following up with a phone call in about a week. If you have any questions, please do not hesitate to contact me.

Sincerely,

Kathleen Burns

Kathleen Burns, BASc (MSc. Candidate)
Phone: 519-807-5891
Email: kburns02@uoguelph.ca

Dr. John Dwyer, PhD (Principal Investigator)
Phone: 519-824-4120
Ext. 52210
Email: dwyer@uoguelph.ca

Dr. Jason Coe, DVM (Co-Investigator)
Phone: 519-824-4120
Ext. 54010
Email: jcoe@uoguelph.ca
Appendix N: Main Study Recruitment Phone Script

“Hi, my name is Kathleen Burns and I am a Masters of Science candidate in the Family Relations and Applied Nutrition (FRAN) department at the University of Guelph. I am following up on a letter I sent Dr. _______ last week. I am a member of a research team of individuals from FRAN and the Ontario Veterinary College at the University of Guelph. For our study, I am interested in talking to veterinarians about their perceptions of dog walking and about their experiences and challenges regarding counselling clients on dog walking. I would like to get in touch with Dr. _______ at your clinic to inquire about participating in the study. Is there a time I could call back to get in touch with her/him? My phone number is 519-807-5891 and my email is kburns02@uoguelph.ca.”
CONSENT TO PARTICIPATE IN RESEARCH

“Main Study: Understanding Veterinarians’ Perceptions of Dog Walking”

You are asked to participate in a research study conducted by Kathleen Burns (MSc. Candidate) and Dr. John Dwyer (Principal Investigator) from the Department of Family Relations and Applied Nutrition (FRAN) and Dr. Jason Coe (Co-Investigator) from the Ontario Veterinary College at the University of Guelph. The results from your participation will be used for Kathleen Burns’ Masters of Applied Human Nutrition thesis.

PURPOSE OF THE STUDY

The purpose of this study is to understand veterinarians’ perceptions about dog walking and their experiences with counselling clients on dog walking.

If you have any questions or concerns about the research, please feel free to contact me (Kathleen Burns):

Kathleen Burns, BASc (MSc. Candidate)  
Phone: 519-807-5891  
Email: kburns02@uoguelph.ca

Dr. John Dwyer, PhD (Principal Investigator)  
Phone: 519-824-4120  
Ext. 52210  
Email: dwyer@uoguelph.ca

Dr. Jason Coe, DVM (Co-Investigator)  
Phone: 519-824-4120  
Ext. 54010  
Email: jcoe@uoguelph.ca

INCLUSION CRITERIA

You are eligible to participate in this research project if you are a practicing veterinarian providing veterinary care for dogs in Ontario.

PROCEDURES
Your participation will involve meeting with the student researcher for a semi-structured interview. The total time commitment for your participation in this study is 45-80 minutes. First, you will be asked to review and sign this consent form.

Second, you will be asked to participate in a one-on-one, face-to-face interview with the researcher. The interview will be approximately 30-45 minutes in length. You will only be asked to participate in a single interview at a location that is convenient for you. The interview will be audio-recorded using two recording devices and will later be transcribed by the researcher and two undergraduate thesis students.

Next, after participation in the face-to-face interview, you will be asked to fill out a questionnaire to assess your physical activity level. You will then complete a background questionnaire that will ask for your name, sex, year of graduation from veterinary college, which veterinary college you attended, whether you own a dog, and how often and for how long you walk your dog (if you own a dog). Combined, both of these questionnaires will take approximately 5 minutes to complete.

You will be asked whether you would like to provide feedback on the main results of the study. If you chose to, you will sign a feedback form and you will then be emailed the main results of the research. You will then have the opportunity to provide your feedback via email, which will take approximately 20 minutes. You will also be asked after the interview if you would like to be re- contacted in the future regarding sharing information about the study with other veterinarians, in the event that we want to recruit more veterinarians. You will then sign a form and will be provided with an information sheet if you choose to be re- contacted.

**POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY**

This study addresses the gap in the research regarding dog walking counselling among veterinarians. The findings from this study may be used to better understand dog walking counselling and the challenges that veterinarians may face, possibly benefiting the veterinary community.

**PAYMENT FOR PARTICIPATION**

You will be provided with a gift card for Starbucks for the amount of $20 as a token of appreciation for your participation.
You will be required to sign a participant compensation form to ensure you have received the $20 gift card token of appreciation.

CONFIDENTIALITY

Every effort will be made to ensure confidentiality of any identifying information that is obtained in connection with this study.

All data generated during this study will remain confidential. The interview will be audio-recorded and transcribed for accuracy.

Two undergraduate thesis students in the Applied Human Nutrition program will be assisting the researcher with transcription and analysis of the interviews. They will not have access to the names of the participants. Instead, they will only have access to the participant number that will be assigned to each participant. The master list of names and assigned participant numbers will be kept under lock and key in either Dr. John Dwyer’s filing cabinet in his office or a filing cabinet in the Applied Human Nutrition graduate student office. Your name will not appear in any research reports and only Dr. John Dwyer and Kathleen Burns will have access to names, sex, year of graduation, and veterinary college graduated from. The researcher and undergraduate thesis students will have their laptops encrypted for this study. The researcher and undergraduate students will transcribe the interviews on the encrypted laptops. Encryption ensures that the transcribed documents are unreadable without the proper passwords. After each interview, the audio recordings will be saved on the researcher’s encrypted laptop and will be deleted from the audio-recording device. The transcribed audio recordings will be saved as an encrypted file.

It is important to have access to the transcripts and participant numbers for publication purposes. This information will be kept 5 years after the research findings are published. This stored information will not be identifying and will be kept under lock and key at the University of Guelph campus for 5 years after the results of the study are published. Written transcripts of the interviews will also be saved in an encrypted file. After this 5 year period, hard copies of these documents will be shredded. The electronic transcripts from the interviews will be permanently deleted.

DISSEMINATION

The results of this study will be published in Kathleen Burns’ Masters Thesis and submitted for possible publication in journals. Dr. John Dwyer may also use the data for teaching purposes.
PARTICIPATION AND WITHDRAWAL

Your participation in this study is completely voluntary. You may refuse to participate, refuse to answer any questions and still remain in the study, or you may withdraw from the study at any time without any consequences. The researcher may withdraw you from this research if circumstances arise that warrant doing so. If you complete the interview, you have 3 days to withdraw from the study by requesting your data be permanently destroyed.

RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Guelph Research Ethics Board.

If you have questions regarding your rights as a research participant, contact:

Sandra Auld, Director, Research Ethics, University of Guelph, reb@uoguelph.ca, 519-824-4120 X56606

SIGNATURE OF RESEARCH PARTICIPANT

I have read the information provided for the study “Understanding Veterinarians’ Perceptions of Dog Walking” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

______________________________________
Name of Participant (please print)

______________________________________   ______________
Signature of Participant      Date

SIGNATURE OF WITNESS

______________________________________
CONSENT TO PARTICIPATE IN RESEARCH

“Main Study: Understanding Veterinarians’ Perceptions of Dog Walking”

You are asked to participate in a research study conducted by Kathleen Burns (MSc. Candidate) and Dr. John Dwyer (Principal Investigator) from the Department of Family Relations and Applied Nutrition (FRAN), and Dr. Jason Coe (Co-Investigator) from the Ontario Veterinary College at the University of Guelph. The results from your participation will be used for Kathleen Burns’ Masters of Applied Human Nutrition thesis.

PURPOSE OF THE STUDY

The purpose of this study is to understand veterinarians’ perceptions about dog walking and their experiences with counselling clients on dog walking.

If you have any questions or concerns about the research, please feel free to contact me (Kathleen Burns):

Kathleen Burns, BASc (MSc. Candidate)  Dr. John Dwyer, PhD (Principal Investigator)  Dr. Jason Coe, DVM (Co-Investigator)
Phone: 519-807-5891  Phone: 519-824-4120  Phone: 519-824-4120
Ext. 52210  Ext. 54010
Email: kburns02@uoguelph.ca  Email: dwyer@uoguelph.ca  Email: jcoe@uoguelph.ca

INCLUSION CRITERIA

You are eligible to participate in this research project if you are a practicing veterinarian providing veterinary care for dogs in Ontario.

PROCEDURES
Your participation will involve meeting with the student researcher for a semi-structured interview. The total time commitment for your participation in this study is 45-80 minutes. First, you will be asked to review and sign this consent form.

Second, you will be asked to participate in a one-on-one, telephone interview with the researcher. The interview will be approximately 30-45 minutes in length. You will only be asked to participate in a single interview at a location that is convenient for you. The interview will be audio-recorded using two recording devices and will later be transcribed by the researcher and two undergraduate thesis students.

Next, after participating in the telephone interview, you will be asked questions to assess your physical activity level. Your responses to these questions will be audio recorded and manually recorded by the researcher. You will then be asked questions from a background questionnaire including your name, sex, year of graduation from veterinary college, which veterinary college you attended, whether you own a dog, and how often and for how long you walk your dog (if you own a dog). Your responses will be audio recorded and manually recorded by the researcher. Combined, both of these questionnaires will take approximately 5 minutes to complete.

You will be asked whether you would like to provide feedback on the main results of the study. If you chose to, you will then be emailed the main results of the research. You will then have the opportunity to provide your feedback via email, which will take approximately 20 minutes. You will also be asked after the interview if you would like to be re-contacted in the future regarding sharing information about the study with other veterinarians, in the event that we want to recruit more veterinarians. Your response will be noted and you will be provided with an information sheet if you choose to be re-contacted.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

This study addresses the gap in the research regarding dog walking counselling among veterinarians. The findings from this study may be used to better understand dog walking counselling and the challenges that veterinarians may face, possibly benefiting the veterinary community.

PAYMENT FOR PARTICIPATION

You will be provided with a gift card for Starbucks via mail, for the amount of $20 as a token of appreciation for your participation.
After participation in the telephone interview, you will be asked to email the researcher upon receiving the $20 gift card token of appreciation.

CONFIDENTIALITY

Every effort will be made to ensure confidentiality of any identifying information that is obtained in connection with this study.

All data generated during this study will remain confidential. The interview will be audio-recorded and transcribed for accuracy.

Two undergraduate thesis students in the Applied Human Nutrition program will be assisting the researcher with transcription and analysis of the interviews. They will not have access to the names of the participants. Instead, they will only have access to the participant number that will be assigned to each participant. The master list of names and assigned participant numbers will be kept under lock and key in either Dr. John Dwyer’s filing cabinet in his office or a filing cabinet in the Applied Human Nutrition graduate student office. Your name will not appear in any research reports and only Dr. John Dwyer and Kathleen Burns will have access to names, sex, year of graduation, and veterinary college graduated from. The researcher and undergraduate thesis students will have their laptops encrypted for this study. The researcher and undergraduate students will transcribe the interviews on the encrypted laptops. Encryption ensures that the transcribed documents are unreadable without the proper passwords. After each interview, the audio recordings will be saved on the researcher’s encrypted laptop and will be deleted from the audio-recording device. The transcribed audio recordings will be saved as an encrypted file.

It is important to have access to the transcripts and participant numbers for publication purposes. This information will be kept 5 years after the research findings are published. This stored information will not be identifying and will be kept under lock and key at the University of Guelph campus for 5 years after the results of the study are published. Written transcripts of the interviews will also be saved in an encrypted file. After this 5 year period, hard copies of these documents will be shredded. The electronic transcripts from the interviews will be permanently deleted.

DISSEMINATION

The results of this study will be published in Kathleen Burns’ Masters Thesis and submitted for possible publication in journals. Dr. John Dwyer may also use the data for teaching purposes.
PARTICIPATION AND WITHDRAWAL

Your participation in this study is completely voluntary. You may refuse to participate, refuse to answer any questions and still remain in the study, or you may withdraw from the study at any time without any consequences. The researcher may withdraw you from this research if circumstances arise that warrant doing so. If you complete the interview, you have 3 days to withdraw from the study by requesting your data be permanently destroyed.

RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Guelph Research Ethics Board.

If you have questions regarding your rights as a research participant, contact:

*Sandra Auld, Director, Research Ethics, University of Guelph, reb@uoguelph.ca, 519-824-4120 X56606*
Appendix Q: Oral Consent Script for Main Study Telephone Interviews

“I am going to turn on the audio recording devices now. Have you received and read the information provided for the pilot/main study “Understanding Veterinarians’ Perceptions of Dog Walking” as described in the consent form? Were questions that you may have had answered to your satisfaction? Do you agree to participate in this study? Do you have a copy of the information letter?

Thank you and we will now begin the interview.”
Appendix R: Snowball Sampling Script for Telephone Interviews

“Thank you for your participation in this study. Your involvement is greatly appreciated. If you know of any other veterinarians who may be interested in participating in this study, would you mind sharing the information about this study with them?”

Yes  No

[If the participant selects yes] “In the event you are re-contacted, please have these veterinarians contact me by phone or email to take part in an interview.” (Send the veterinarian the Study Information Sheet via mail/email/fax).

“Your time is greatly appreciated. Thank you again for your participation.”
Appendix S: Main Results Feedback Form for Face-to-Face Interviews

Request to receive an overall preliminary summary of the research findings and/or to provide feedback on whether the themes capture your voice from your personal interview.

Please circle one response for the following questions.

1. I would like to receive a summary of the results of this overall research project.
   a. Yes
   b. No

2. I would like to provide feedback via email about whether my voice from my personal interview was captured in the overall themes identified in the study.
   a. Yes
   b. No

Thank you very much for your participation!
Appendix T: Main Results Feedback Form for Telephone Interviews

1. Would you like to receive a summary of the results of this overall research project?
   a. Yes
   b. No

2. Would you like to provide feedback via email about whether your voice from your personal interview was captured in the overall themes identified in the study?
   a. Yes
   b. No

Thank you very much for your participation!
Appendix U: Participant Compensation Form for Face-to-Face Interviews

Please initial this section to confirm that you have received the gift card for Starbucks for the amount of $20 as a token of appreciation for participating in this study.

Participant # ______

My initials on this page indicate that I have received the gift card for Starbucks for the amount of $20 for participating in the study “Veterinarians’ Perceptions of Dog Walking” by Kathleen Burns.

Initial ______

Thank you, and your participation is greatly appreciated!
Date

Dear Dr. ,

My name is Kathleen Burns and I am a Masters of Science candidate at the University of Guelph. You recently participated in a study conducted by a research team of individuals from the Family Relations and Applied Nutrition (FRAN) department and the Ontario Veterinary College at the University of Guelph called, “Understanding Veterinarians’ Perceptions of Dog Walking”. Thank you very much for your participation in this research.

I mailed a $20 Starbucks gift card to your clinic as a token of appreciation for participation in the study on Insert Date . I am following up with you to ensure you have received this token of appreciation. Please email me at your earliest convenience to let me know that you have received the gift card.

Thank you again. Have a great day.

Sincerely,

Kathleen Burns, BASc
(MSc. Candidate)
Phone: 519-807-5891
Email: kburns02@uoguelph.ca
Appendix W: Script for Review of and Feedback on Main Results

Dear Dr. [Name],

Thank you for your participation in the study “Understanding Veterinarians’ Perceptions of Dog Walking”, a University of Guelph study by Kathleen Burns, Master of Science Candidate. You are receiving this email because you indicated that you were interested in reviewing and/or providing feedback on the main themes identified in the study.

A document containing a summary of the themes identified across all interviews is attached to this email. If you choose to, please read them and let me know if you think these themes capture the information you shared with me in your interview. All thoughts and opinions you may have regarding these main results are welcome and would be greatly appreciated. Your feedback would assist me in confirming and finalizing the results of this study.

Please type your comments in this space, save the document, and return it to the sender in an email reply.

COMMENTS:

______________________________________________________________________________
______________________________________________________________________________
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Thank you again for your participation in this study and for your feedback on the main results.

Sincerely,

Kathleen Burns, MSc Candidate.
Appendix X: Summary of Results for Member Checking

1a.) Veterinarians’ Behaviours: Approaches to talking to clients about dog walking.

<table>
<thead>
<tr>
<th>Sub-Theme(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme: Not part of Standard Discussion</td>
<td>Describes when dog walking is not a routine discussion during appointments with clients.</td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Theme: Physical Condition of the Dog</td>
<td></td>
</tr>
<tr>
<td>1a.) Overweight</td>
<td>Describes when veterinarians talk about dog walking only when there is an overt and obvious health issue with the dog. Also includes when discussions of dog walking are influenced by the physical condition of the dog.</td>
</tr>
<tr>
<td>1b.) Injury</td>
<td></td>
</tr>
<tr>
<td>a.) Overweight</td>
<td>Describes when veterinarians talk about dog walking when they see that the dog is overweight. Can also describe an inclination to talk about dog walking with the owners of an overweight or an obese dog.</td>
</tr>
<tr>
<td>b.) Injury</td>
<td>Describes specific discussions of dog walking with dogs that have a disease or injury. I.e., arthritis, soft tissue injury.</td>
</tr>
<tr>
<td>Theme: Life stage of the dog</td>
<td></td>
</tr>
<tr>
<td>a.) Puppy</td>
<td>Describes discussions of dog walking as initiated by the life stage of the dog.</td>
</tr>
<tr>
<td>b.) Geriatric</td>
<td>Describes discussions of dog walking when the dog is a puppy. Includes how veterinarians may be more inclined to talk about dog walking with the owners of puppies.</td>
</tr>
<tr>
<td>a.) Puppy</td>
<td></td>
</tr>
<tr>
<td>b.) Geriatric</td>
<td>Describes discussions of dog walking in geriatric dogs. Includes how veterinarians may be more inclined to talk about dog walking with the owners of older dogs.</td>
</tr>
<tr>
<td>Theme: Behavioral</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>Used to describe when veterinarians' discussions of dog walking are influenced or dependent on the behavior of the dog. Veterinarians are more likely to talk about dog walking when the dog has behavioral issues, i.e., aggression or leash pulling, etc.</td>
</tr>
</tbody>
</table>

1b: Veterinarians’ Behaviours: Approaches to talking to clients about overweight and obesity.

<table>
<thead>
<tr>
<th>Sub-Theme(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme: Combined discussion of nutrition and physical activity</td>
<td></td>
</tr>
</tbody>
</table>
When participants describe how nutrition and physical activity are discussed in tandem: weight is not often solely a physical activity issue.

**Theme: Awareness among owners**

N/A

Used to describe how the veterinarian gets the owner to understand that their dog is overweight or obese. Can include that their body condition score is not ideal and includes visual tools (i.e., diagrams), showing the client the body condition chart.

**Theme: Follow-Up appointments**

N/A

Describes when the veterinarian uses follow-ups to help reduce overweight or obesity in the dog. I.e., follow-up appointments or weight-checks.

### 2a: Attitudes: Behavioural beliefs regarding dog walking.

<table>
<thead>
<tr>
<th>Sub-theme</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Theme: Dog walking is important</strong></td>
<td>Describes the importance of owners to walk their dogs. Can describe that it is important for dogs to go for a leash walk versus other types of exercise. Can also describe that dog walking is an important part of dog ownership</td>
</tr>
<tr>
<td><strong>Theme: Dog walking is not always important</strong></td>
<td>Describes how dog walking is not always important for all dogs and that other forms of exercise can be beneficial</td>
</tr>
</tbody>
</table>

### 2b: Attitudes: Perceived benefits of dog walking.

<table>
<thead>
<tr>
<th>Sub-Theme</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Theme: Bonding</strong></td>
<td>Describes how dog walking strengthens the human-dog bond or the relationship between a dog and its owner</td>
</tr>
<tr>
<td><strong>Theme: Mutual Physical Activity</strong></td>
<td>Describes one of the benefits of dog walking as being physically beneficial for both the owner and the dog</td>
</tr>
<tr>
<td><strong>Theme: Benefits for the Dog</strong></td>
<td>Describes a positive impact of dog walking on the dog's fitness levels. Can encompass weight loss, ideal weight management, functionality, disease risk reduction, disease management and prevention.</td>
</tr>
</tbody>
</table>
b.) Social benefits for the dog  
Describes the social benefits of dog walking which may include interactions and socialization with other dogs or people.

c.) Mental benefits for the dog  
Describes how dog walking can benefit the dog's behavior or mental health. Can encompass discussions about reduced aggression, increased mental stimulation and happiness.

Theme: Benefits for the Owner

a.) Social benefits for the owner  
Describes some of the social benefits of dog walking for humans. Can include socialization with neighbors, other dog owners, family, interacting with the world.

b.) Physical activity for the owner  
Describes how dog walking can help humans to be physically active. Can describe that humans may not get exercise otherwise, provides them with an exercise routine, and/or gets them active.

3a: Norms: Descriptive norms regarding dog walking and dog walking counselling among veterinarians

<table>
<thead>
<tr>
<th>Sub-Theme</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Theme: Positive perception</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>When participants perceive that other veterinarians do discuss dog walking with their clients.</td>
</tr>
</tbody>
</table>

Theme: Negative perception

<table>
<thead>
<tr>
<th>Sub-Theme</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>N/A</td>
<td>When participants do not perceive that other veterinarians discussed dog walking with dog owners or that they did not have this conversation often enough.</td>
</tr>
</tbody>
</table>

3b: Norms: Injunctive norms regarding dog walking and dog walking counselling among veterinarians

<table>
<thead>
<tr>
<th>Sub-Theme</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Theme: Lack of expectations from owners</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>Discussions of how there are no/low expectations from dog owners for veterinarians to discuss dog walking with them.</td>
</tr>
<tr>
<td>Not expected to be discussed by the veterinarian</td>
<td>When participants describe how dog owners do not expect discussions of dog walking to come from their veterinarian. May describe how dog owners expect dog walking to be discussed by another professional i.e., dog trainers, etc.</td>
</tr>
</tbody>
</table>

4: Self-efficacy (Confidence): regarding dog walking counselling among veterinarians
<table>
<thead>
<tr>
<th>Sub-Theme</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Theme: High Confidence</strong></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>When veterinarians discuss having high confidence when talking about dog walking in general with clients.</td>
</tr>
<tr>
<td>Personal Experience</td>
<td>When confidence in talking to clients about dog walking comes from the veterinarians' personal experience. (I.e., personal dog ownership)</td>
</tr>
<tr>
<td><strong>Theme: Low Confidence</strong></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>When participants express that they have a low level of confidence when talking to owners about dog walking.</td>
</tr>
</tbody>
</table>

5: Environmental factors: External barriers to counselling clients on dog walking.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Theme: Owner Related</strong></td>
<td></td>
</tr>
<tr>
<td>Owner’s busy schedule</td>
<td>Describes the challenge to talk about dog walking if the dog owner is busy or lacks the time to walk their dog.</td>
</tr>
<tr>
<td>Owner non-compliance to dog-walking recommendations</td>
<td>Describes dog owners’ lack of compliance with dog-walking recommendations as a challenge for participants when talking about dog walking with dog owners.</td>
</tr>
<tr>
<td>Owner Beliefs</td>
<td>The owner's beliefs about dog walking make discussions of dog walking challenging. I.e., the client believes their dog should be off leash, they underestimate the exercise needs of the dog.</td>
</tr>
<tr>
<td><strong>Theme: Physical Condition of Owner</strong></td>
<td></td>
</tr>
<tr>
<td>Disability of the dog owner</td>
<td>Describes when the discussion of dog walking is difficult if the owner has a physical disability that affects their ability to walk.</td>
</tr>
<tr>
<td>Overweight owner</td>
<td>Describes when discussions of dog walking are complicated when the owner appears to be overweight or obese.</td>
</tr>
<tr>
<td><strong>Theme: The dog’s behavior</strong></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>Describes how the behavior of the dog may make discussions of dog walking more difficult. I.e., tugs on the leash, pulls a lot, inter-dog aggression.</td>
</tr>
<tr>
<td><strong>Theme: Time/Priority in Appointment</strong></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>Lack of time in an appointment to discuss dog walking with owners is a challenge. Discussions about how dog walking may be a lower priority topic in an appointment.</td>
</tr>
</tbody>
</table>

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include comments about more important or urgent matters. Can also be related to time constraints.

6: Skills and abilities: related to counselling clients on dog walking as a practicing veterinarian.

<table>
<thead>
<tr>
<th>Sub-Theme</th>
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</thead>
<tbody>
<tr>
<td>Theme: Lack of Formal Training</td>
<td>Describes aspects of the DVM program as not dealing directly with dog walking or not adequately teaching about dog walking or exercise.</td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Personal Experience</td>
<td>Describes knowledge or training about dog walking that comes from a personal experience or personal educational experiences. I.e., owning dogs, other dogs outside, or in veterinary practice.</td>
</tr>
</tbody>
</table>