HHS Public Access

Author manuscript

J Phys Act Health. Author manuscript; available in PMC 2016 June 16.

Published in final edited form as:

J Phys Act Health. ; 12(6 0 1): S102–S109. doi:10.1123/jpah.2013-0229.

Odds of Getting Adequate Physical Activity by Dog Walking

Jesus Soares,
Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, Atlanta, GA

Jacqueline N. Epping,
Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, Atlanta, GA

Chantelle J. Owens,
Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, Atlanta, GA

David R. Brown,
Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, Atlanta, GA

Tina J. Lankford,
Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, Atlanta, GA

Eduardo J. Simoes, and
Dept of Health Management and Informatics, University of Missouri, School of Medicine, Columbia, MO

Carl J. Caspersen
Division of Diabetes Translation, Centers for Disease Control and Prevention, Atlanta, GA

Jesus Soares: JSoares@cdc.gov

Abstract

Background—We aimed to determine the likelihood that adult dog owners who walk their dogs will achieve a healthy level of moderate-intensity (MI) physical activity (PA), defined as at least 150 mins/wk.

Methods—We conducted a systematic search of 6 databases with data from 1990–2012 on dog owners' PA, to identify those who achieved MIPA. To compare dog-walkers' performance with non–dog walkers, we used a random effects model to estimate the unadjusted odds ratio (OR) and corresponding 95% confidence interval (CI).

Results—We retrieved 9 studies that met our inclusion criterion and allowed OR calculations. These yielded data on 6980 dog owners aged 18 to 81 years (41% men). Among them, 4463 (63.9%) walked their dogs. Based on total weekly PA, 2710 (60.7%) dog walkers, and 950 (37.7%) non–dog walkers achieved at least MIPA. The estimated OR was 2.74 (95% CI 2.09–3.60).

Conclusion—Across 9 published studies, almost 2 in 3 dog owners reported walking their dogs, and the walkers are more than 2.5 times more likely to achieve at least MIPA. These findings suggest that dog walking may be a viable strategy for dog owners to help achieve levels of PA that may enhance their health.

Keywords

exercise; pet ownership; health promotion

Insufficient physical activity (PA) is a significant risk factor for a wide variety of chronic diseases and conditions and is associated with increased medical costs.[1,2] According to the 2008 Physical Activity Guidelines for Americans, "for substantial health benefits, adults should do at least 150 minutes a week of moderate-intensity (equivalent to a brisk walk for many people), or 75 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity (MVPA).[3]

According to these PA Guidelines, aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week. Some PA is better than none, and any amount seems to confer some health benefits.[3] Approximately half of the US adult population does not achieve recommended levels of PA.[4,5] This high rate of inadequate PA underscores the need to identify strategies to promote physical activities that are practical, sustainable, and accessible to as many people as possible. Dog walking may be such a strategy. Walking is a popular, easy, and sustainable form of physical activity with proven health benefits and a low risk of injury.[6]

The US pet ownership statistics show that 36.5% of households in the United States have at least 1 dog.[7] A number of health benefits are associated with owning dogs.[8,9] In addition to the health benefits of dog ownership, per se, a growing body of literature demonstrates an association between dog ownership and PA.[10–12] Several characteristics of dog walking suggest that encouraging people to engage in dog walking may be an effective means of increasing overall PA levels and improving the health of the US population.[13] For example, dog walking is a purposeful activity, and dogs can provide social support, companionship, and an increased sense of safety for walking.[14] The association of dog walking with PA guidelines adherence has been examined.[15] However, most studies have not examined the likelihood of reaching PA levels deemed important to health among dog owners who walk their dogs as opposed to dog owners who do not walk their dogs. To our knowledge, there are no published compiled data showing this prevalence.

Objectives

The goal of this review and meta-analysis was to determine whether adults who own and walk a dog are more likely achieving 150 minutes of PA per week than adults who own a dog but do not walk it.

Methods

Search Strategy

To identify potentially relevant articles for this review, 6 electronic databases were searched for the period January 1990 to May 2012 (Table 1), with the assistance of the Centers for Disease Control and Prevention (CDC) Library and Information Center. Members of the International Dog Walking and Activity Group were consulted to check for missing or unpublished studies.

Screening and Abstraction Strategy

Our search produced a total of 199 abstracts. Later, we added an article that was not captured by the search. Two reviewers independently screened and examined each abstract and discarded those that did not provide data on dog owners' physical activity behavior. Reviews, reports, case reports, and qualitative studies were excluded. Full-text articles in PDF format were collected for the abstracts that passed the screening process. These articles were then reviewed to determine if they provided physical activity data for dog owners who walk their dog (DW) and dog owners who do not walk their dog (NDW).

Seven studies identified DW by the answer to a dichotomous question regarding whether they walked their dog, one study by the response to a question as to whether they walked their dog for at least 10 minutes at a time over the preceding week, and another study by the response to a question as to whether they walked with the dog at least 3 times per week. For each of these studies, we examined outcome data (total weekly physical activity, time spent walking the dog, total weekly walking time, the number or percentage of individuals who achieved at least 150 minutes of PA per week). This amount of physical activity is common among the published PA recommendations over the time that the studies gathered data and is also commonly linked to an intensity of PA that is at least moderate[16] or moderate to vigorous.[17] In 4 studies the authors assessed whether participants achieved 150 min/wk of at least moderate PA.[18–21] and in 1 study[15] 150 min/wk of moderate to vigorous PA was assessed.

According to the 2008 Physical Activity Guidelines for Americans,[3] 150 minutes of moderate intensity PA is one way to attain a total amount of PA that would also be reached by 75 minutes of vigorous PA or some combination of both moderate and vigorous intensity PA.[3] Oka and Reeves assessed whether study participants met this latter recommendation.[22,23] Coleman determined whether participants met the moderate to vigorous PA recommendations[17] by accelerometer activity count, "cut points" established for the Actigraph (≥ 1952 counts per minute),[24] if the participants engaged in average of 30 minutes or more of MVPA per day. Lentino used the total metabolic equivalent (MET) minutes per week to categorize participants as participating in moderate to vigorous PA if they achieved ≥ 600 MET minutes per week.[25] Based on the findings from the studies in this review, we used the terms "meeting recommendations" or "achieving 150 minutes of at least moderate intensity PA" because they represent a level of PA participation that the study authors expected to be conducive to health.

Key study features included author, year, study design, survey characteristics, sample characteristics, dog owner characteristics, and method of PA assessment (Table 2).

Analysis

We pooled data from the abstracted studies using Comprehensive Meta-Analysis statistical software[26] to estimate the prevalence odds ratios (OR) and corresponding confidence intervals (CI) of achieving 150 minutes per week of at least moderate-intensity, total PA participation by dog walking status among dog owners. We used the random effects model in estimation, which allows for heterogeneity between studies.

Results

Of the 200 records collected, we retrieved a total of 44 relevant articles on dog ownership and health outcomes. Of these, 9 studies met our inclusion criterion and allowed us to collect the data to calculate the prevalence OR of achieving a total of 150 minutes per week of at least moderate intensity PA. Three studies had been conducted in 5 cities in the United States: Seattle, WA and Baltimore, MD;[27] San Diego, CA;[15] and Memphis, TN and Pittsburgh, PA;[28] 1 was conducted at the state level in Michigan;[23] and 1 study used a national sample.[25] Three studies from Australia included those conducted in New South Wales,[18] Perth,[19] and Queensland.[21] One study was from a national sample in Japan.[22] Of the 9 studies, 8 used a cross-sectional design; 1 used a prospective cohort design and was analyzed both cross-sectionally and longitudinally. For the latter study, we used only the cross-sectional data from the second measurement cycle.[28] Altogether these studies provided a total sample of 6980 dog owners (41% male, 59% female) ranging in age from 18 to 81 years. Among these, 4463 (63.9%) reported that they walked their dogs. Eight studies used self-reported questionnaires and 1 study[27] used accelerometers to assess dog owners' PA (Table 2).

The owners' reported weekly time spent walking the dog varied from 46 minutes[18] to 300 minutes[25] (Table 3). The total weekly walking time of owners who walked their dogs, as reported in the studies, varied from 120 minutes[18] to 252 minutes.[22] The total weekly PA time varied from 210[18] to 410 minutes.[22]

Based on total weekly PA of 6980 dog owners, 2710 (60.7%) who walked their dogs and 950 (37.7%) who did not walk their dogs met levels of PA recommended in the aerobic component of the 2008 Physical Activity Guidelines for Americans (Table 4).

The point estimate for random effects of meta-analysis was an OR (95% CI) of 2.74 (2.09, 3.60). The diamond represents the pooled OR of achieving 150 minutes of PA for dog walkers versus non–dog walkers (Figure 1). Significant heterogeneity between studies was found (Q-value = 47.141, df = 8, $P < 0.001$)

Discussion

The goal of this review was to determine the crude prevalence OR of achieving 150 minutes of PA per week when owners walked their dogs. We reported PA indicators, such as time

spent walking the dog, total weekly walking time, and total weekly PA. Our data show that dog owners who walk dogs are more physically active than owners who do not walk dogs based on total weekly PA, and they are 2.74 times more likely to achieve 150 minutes of PA than owners who don't walk their dog (Figure 1).

Our findings are generally consistent with those from studies that have examined and compared PA between people who have and people who don't have dogs, and findings indicate that an association between dog ownership and increased PA exists in various population subgroups. A 2009 Canadian study of 658 dog owners and non–dog owners found that those dog owners who walked their dogs spent more time walking for leisure than dog owners who walked their dog minimally or not at all, and also walked more than people who did not own a dog.[29] Specifically, dog owners who walked their dogs walked for leisure 383 minutes more than dog owners who walked their dog minimally or not at all and 339 minutes more than people who did not own a dog.[29] In an observational study in the United Kingdom, among 11 466 pregnant mothers, dog owners were 50% more likely to achieve 3 or more hours of PA per week and were also more likely to participate in brisk walking than those who did not have a dog.[30] A UK study of 2065 children aged 9 to 10 years found that those living in a household with a dog spent more time in light, moderate to vigorous, and vigorous PA and also recorded more overall accelerometer-activity counts, counts per minute, and overall steps compared with people who were not dog owners.[31]

The findings from these 3 studies indicate that the association between dog ownership and increased PA exists among various population subgroups. The majority of cross-sectional studies examined in a critical review of the literature found that pet owners (and in particular, dog owners) were more likely to be physically active compared with nonowners.[10] Also, an Australian study has shown that following acquisition of a dog, weekly walking increased by 31 minutes per week,[32] while in a British study, the number and duration of recreational walks increased, and was maintained 6 and 10 months later.[33]

The amount of time spent walking the dog is an important factor to be considered in determining the contribution that dog walking makes to total weekly PA and to meeting PA guidelines. For example, Bauman et al, reported data from 3 dog-walking categories ("walks dog up to 1 hour/week," "walks dog 1–2.5 hours/week," "walks dog > 2.5 hours/week") to reveal an estimated mean time for walking the dog of 0.95 hours (95% CI, 0.77–1.13 hours) per week and also reported that that dog owners who walked their dog for at least 1 hour a week were more likely (OR, 1.89) than nonowners to achieve the recommended 150 minutes per week of PA for health benefits.[18] In a 1-year prospective weight loss study, Kushner, et al found that, in participants paired with dogs, approximately 66% of all PA performed was dog-related and that average total weekly PA time increased from 2.8 hours from baseline to 3.9 hours posttest.[34] These findings support the notion that having a dog and walking a dog can both add time to total weekly PA.

Although most studies to date that have examined the relationship between dog walking and PA have been cross-sectional, a small intervention study (n = 58) found that dog owners who were encouraged to walk dogs increased total weekly walking from 57 to 150 minutes from baseline to 12 weeks, compared with an increase of 83 to 133 minutes in the control

group.[35] The intervention group also had 1823 more total pedometer step-counts compared with the control group in addition to the significantly higher trajectories in self-reported PA from baseline to 12 weeks ($\eta^2 = 0.11–0.27$).[35] The latter finding demonstrated that an increase in time spent walking the dog did not reduce time spent walking without the dog.

The size, age, health status, and breed of the dog may influence the amount of time spent dog walking. Schofield et al found that the households with medium or large dogs had significantly more minutes of recreational walking per week than those with small dogs or no dogs.[21] Reeves et al found that there was no overall effect of dog size on the prevalence of dog walking among all dog owners or weekly frequency of dog walking; however, walks were longer with larger breeds than with smaller breeds. Dog age was significantly related to prevalence and duration of dog walks (ie, older dogs were walked less frequently and for shorter duration than younger dogs).[23]

Dog walking as a strategy to increase PA could reach a large proportion of the US population. According to the American Veterinary Medical Association—US Pet Ownership and Demographics Sourcebook 2012, there are approximately 70 million dogs in US households.[7] Dogs and other pets are becoming increasingly valued members of households. As an example, pet expenditures in the United States grew from $17 billion in 1994 to approximately $47.7 billion in 2010.[36] Despite pets becoming increasingly valued as household and family members, as many as 36% of dog owners don’t walk their dogs. Depending on breed, health status, and age, most healthy dogs are recommended to get 30–60 minutes of exercise daily to remain fit.[37] Simply walking a dog at a moderate intensity for the frequency and duration recommended for dogs would result in the dog walkers exceeding current guidelines for adults for moderate intensity aerobic PA. Even if walking the dog is performed at light intensity (less than 3 METS), health benefits are still likely to be gained.[3,25] In a study of diabetes patients, Peel and colleagues noted that dogs helped to maintain a PA regimen,[38] suggesting the value of dog walking to patient care, while providing benefit to the dog, as well.

Limitations and Strengths

This review has some limitations. It included primarily cross sectional studies and no randomized control trials. The majority of the studies used self-reported PA. The studies described the criteria to achieve recommended levels of PA per week, but how recommended levels were computed was mixed. Achieving recommended levels of PA was based on total weekly PA, which did not enable us to determine what quantity of dog walking contributed to success of meeting recommendations. Finally, our crude estimate did not control for confounders.

However, strengths of this review are that it included a variety of studies conducted at local, state, and national levels, in a variety of populations, and in 3 countries. It is also the first study to determine the pooled prevalence ORs of achieving recommended levels of PA between dog owners who walk their dogs and dog owners who do not walk their dogs. This is important because dog ownership has costs related to caring for the dogs (such as feeding, veterinarian care, grooming), and household income is a strong predictor of PA. By

including only dog owners in our review, we felt that we controlled, at least to some extent, for the effect of variable household income on the association under investigation.

Conclusion

Our systematic review revealed that, across 9 published studies, almost 2 in 3 dog owners report walking their dogs, and these particular walkers are more than 2.5 times more likely to have achieved recommended levels of PA when considering total weekly PA. Future research should examine whether adjustment for covariates affects this association. However, we found sufficient evidence that dog walking may be a viable strategy for dog owners to help reach recommended levels of PA to enhance their health.

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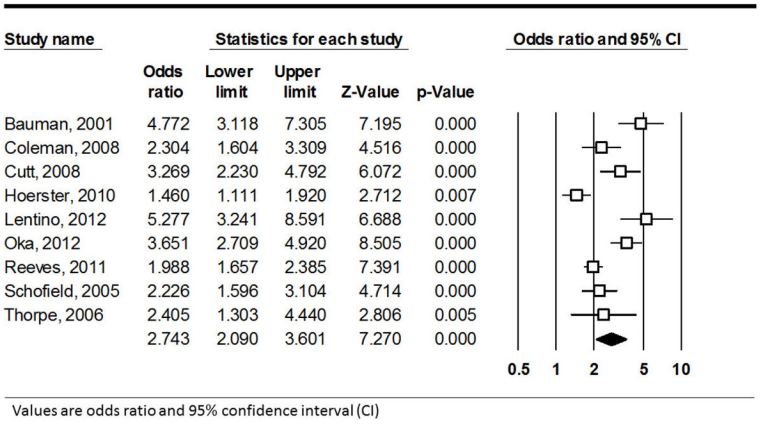

Figure 1.

Odds of achieving 150 min/week of physical activity by total weekly physical activity among dog owners who walk a dog versus dog owners who don't.

Table 1

Search Strategy[a]

Search syntax for electronic databases
Key terms: (dog *or* dog walking *or* dog ownership *or* canine *or* pet *or* pet ownership *or* companion animal *or* human animal interaction) AND (walk* *or* physical activity *or* leisure-time physical activity *or* leisure-time exercise *or* physical fitness *or* health* or human health)
Study designs: (intervention)* *or* controlled clinical trial *or* evaluation studies *or* process evaluation *or* evaluation* *or* randomized controlled trial *or* random allocation *or* non randomized *or* nonrandomized *or* nonrandomized or pseudo randomized *or* quasi experimental *or* pseudo experimental *or* experiment* *or* cross-sectional study *or* comparative studies *or* comparison* *or* controlled before and after study *or* uncontrolled before and after study *or* cohort study *or* cohort studies NOT (reviews *or* reports *or* case reports *or* qualitative studies)
Search restrictions: Age: 18–100 years. Subjects: human subjects only. Language: English only. Publication dates: January 1990–May 2012.

[a]Electronic databases searched: Sociological Abstracts (ProQuest), PubMed, Medline (OVID), PsycInfo (OVID), CAB Abstracts (OVID), Web of Science.

*Search terms expanded.

Table 2

Characteristics of the Included Studies of Physical Activity (n = 9)

Author, year	Survey location	Sample characteristics	Study sample characteristics (N, age, male status, % dog owners)	Dog owner characteristics (N, age and male status)	PA measure and instrument
Bauman, 2001	New South Wales, Australia	Telephone survey respondents of a population-based random sample drawn from the Electronic White Pages (Response rate: 74%)	N = 894 Age: Range of 25–64 yrs. Male: 45.6% Dog owners: 46%	N = 410 Age: Not specified Male: Not specified	Self-reported PA questions from the Australian Bureau of Statistics of 1991
Coleman, 2008	Seattle, Washington, and Baltimore, Maryland, USA	Participants selected from the "Neighborhood Quality of Life Study" designed to compare multiple health outcomes among residents of neighborhoods stratified on characteristic of the ability to walk in the neighborhood (Response rate: NR)	N = 2199 Age: Range of 20–65 yrs. Male: 52% Dog owners: 28%	N = 612 Age: Range of 20–65 yrs. Male: 55%	PA assessed by accelerometer for 7 consecutive days for at least 10 h/day
Cutt, 2008	Perth, Western, Australia	Dog owners identified from individuals participating in the RESIDE Project during the first follow-up of a 5-yr longitudinal study (Response rate: 33.4%)	N = 1379 Age: Not specified Dog owners: 45.6% (for additional description of the population from RESIDE, see Giles-Corti, 2008)	N = 629 Age: Not specified Male: Not specified	Self-reported PA questions from RESIDE's Neighborhood Physical Activity Questionnaire
Hoerster, 2011	San Diego, California, USA	Respondents to a mailed survey of dog-owing clients of 2 veterinary clinics in 2008 (Response rate: For Clinic 1 = 31.4%, retest = 74%; and, for Clinic 2 = 32.6%, retest = 82%)	N = 984 Age: Mean of 52.3 (SD = 13.7) yrs. Dog owners: 100%	N = 984 Age: Mean of 52.3 (SD = 13.7) yrs. Male: 22.2%	Self-reported questions specific for the study (paper and pencil)
Lentino, 2012	Sample from multiple sources, USA	Participants recruited via classifieds advertisements (Craiglist.org), social networking group forums (Dogster.com), and dog-related blogs (Response rate: 95%)	N = 916 Age: Mean of 40.0 (SD = 13) yrs. Male: 22% Dog owners: 58.5%	N = 536 Age: Range of 27–56 yrs. Male: 16%	Self-reported PA questions from International Physical Activity Questionnaire Short Form (IPAQ-SF)
Oka, 2012	Japanese national sample, Japan	Respondents of an Internet-based survey in Japan (Response rate: 31.3%)	N = 5253 Age: Range of 20–79 yrs. Male: Not specified Dog owners: 18%	N = 834 Age: Mean of 42.0 (SD = 12.4) yrs. Male: 43.4%	Self-reported PA questions from IPAQ-SF
Reeves, 2011	State of Michigan, USA	Participants of the 2005 Michigan Behavioral Risk Factor Survey (BRFS) (Response rate: 51.1%)	N = 5819 Age: Range of 18–65 yrs. Male: 38% Dog owners: 41%	N = 2170 Age: range = 18–65 yrs. Male: 38%	Self-reported BRFSS questions for dog ownership and walking
Schofield, 2005	Queensland, Australia	Telephone survey respondents of a population-based random sample drawn from the Electronic White Pages (Response rate: 43.3%)	N = 1237 Age: Older than 18 yrs. Male: Not specified Dog owners: 52.2%	N = 410 Age: Not specified Male: Not specified	Self-reported PA questions from the Australian Bureau of Statistics of 1991

Author, year	Survey location	Sample characteristics	Study sample characteristics (N, age, male status, % dog owners)	Dog owner characteristics (N, age and male status)	PA measure and instrument
Thorpe, 2006	Memphis, Tennessee and Pittsburgh, Pennsylvania	Participants of the Health, Aging and Body Composition Study using a random sample of white Medicare recipients and all age-eligible black residents of 2 US cities (Response rate: Not specified)	N = 2533 Age: Range of 70–81 yrs. Male: 48%	N = 394 Age: Range of 70–79 yrs. Male: 54%	Self-reported PA questions from face-to-face interview

Abbreviations: PA, physical activity.

Table 3

Description of Dog Walkers' Physical Activity (PA) Reported in the Studies

Author, year	Weekly time spent walking the dog	Total weekly walking time	Total weekly PA
Bauman, 2001	M = 0.95 (95%CI, 0.77–1.13) hrs (57 min)/wk	2.0 (95%CI, 1.8–2.2) hrs (120 min)/wk	M = 3.5 (95%CI, 3.1–3.8) hrs/wk (210 min/wk)
Coleman, 2008	Not specified	Not specified	M = 35 (SE, 24) min/day (245 min/wk)
Cutt, 2008	M = 133.8 (SD, 112.8) min/wk	M = 180.1 (SD, 161.4) min/wk	M = 356.5 (SD, 326.5) min/wk
Hoerster, 2011	M = 186.3 (SD, 7.4) min/wk	Not specified	M = 355.4 (SD, 378.5) min/wk
Lentino, 2012	Volume of 300 min/wk	Not specified	M = 4805.49 (MET min/wk)
Oka, 2012	M = 214.1 (SD, 189.5) min/wk	M = 252.2 (SE, 11.4) min/wk	M = 409.8 (SE, 19.1) min/wk
Reeves, 2011	Median = 85 (IQR, 37 to 173) min/wk	Median = 132 (IQR, 57–240)	At least 150 min/wk
Schofield, 2005	Modal = 30 min/day for 7 days/wk	M = 114.9 (SD, 197.9) min/wk	M = 334.8 (SD, 408.6) min/wk
Thorpe, 2006	M = 7 times per week (min not specified)	Not specified	At least 150 min/wk

Abbreviations: M, mean; SD, standard deviation; SE, standard error; IQR, interquartile range; CI, confidence interval; MET, metabolic equivalent.

Table 4

Number of Dog Walkers and Non–Dog Walkers Achieving 150 Minutes of Physical Activity (PA) per Week

	Achieved 150 min of PA per wk		
	Yes	**No**	**Total**
Dog walkers	2710	1753	4463
Non–dog walkers	950	1567	2517
Total	3660	3320	6980