

Family Dog Ownership and Levels of Physical Activity in Childhood: Findings From the Child Heart and Health Study in England

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Dog ownership is associated with higher physical activity levels in adults; whether this association occurs in children is unknown. We used accelerometry to examine physical activity levels in 2065 children aged 9 to 10 years. Children from dog-owning families spent more time in light or moderate to vigorous physical activity and recorded higher levels of activity counts per minute (25; 95% confidence interval [CI]=6, 44) and steps per day (357; 95% CI=14, 701) than did children without dogs. (*Am J Public Health*. 2010;100:1669–1671. doi:10.2105/AJPH.2009.188193)

Adults who own dogs are more physically active (taking approximately 25% more steps per day) than are those who do not own dogs.^{1–8} However, the association between dog ownership and physical activity levels in children remains unknown. We therefore examined whether family dog ownership is associated with objectively measured physical activity in a population-based study of 2065 9- to 10-year-old children from different ethnic groups.

METHODS

The Child Heart and Health Study in England (CHASE) was a school-based cross-sectional survey of the cardiovascular health of children of White European, Black African-Caribbean, and South Asian origin in 3 cities

(London, Birmingham, and Leicester, UK).⁹ Physical activity measurements were carried out in 78 schools studied between February 2006 and February 2007.¹⁰ Children were asked to wear an ActiGraph GT1M activity monitor (ActiGraph, LLC, Pensacola, FL) over the left hip on an elasticized belt during waking hours for 7 complete days. On return of the instrument, ActiGraph data files were downloaded and batch processed with a dedicated program (MAHUFFe; MRC Epidemiology Unit, Cambridge, UK; available at http://www.mrc-epid.cam.ac.uk/Research/Programmes/Programme_5/InDepth/Programme%205_Downloads.html).

Outcomes included mean daily activity counts, mean daily steps, and activity counts per minute (cpm) of registered time; days with less than 600 minutes were excluded. Mean daily times (minutes) spent in sedentary (defined as <100 cpm), light (100 to <2000 cpm), and moderate to vigorous (≥ 2000 cpm) physical activity also were used (equivalent to walking at least 4 km/h).^{11,12}

Ethnic origin of the child was based on parentally defined ethnicity and classified as White European, South Asian, Black African-Caribbean, or “other.” Child questionnaires asked “Do you have any pets at home?” and, if so, “What kinds of pets?” Children were classified as dog owners or non-dog owners. We compared differences in activity outcomes by dog ownership category with multilevel linear regression adjusted for age, gender, ethnicity, socioeconomic position (based on self-reported parental occupation coded according to the Standard Occupational Classification 2000),¹³ allowing for day of the week, day order of recording (i.e., whether it was the first, second, third, and so forth day of recording), and month, with school fitted as a random effect.¹⁰

RESULTS

In all, 2065 children provided at least 1 complete day of ActiGraph recording and questionnaire data (participation rate=69%), with similar numbers of children and participation rates by ethnic group. Overall, 10% of the participants had family dogs; family dog ownership was more prevalent among White European children (22%) than among other ethnic groups (all <10%; Table 1).

Children with a dog spent more time in light, moderate to vigorous, and vigorous physical activity and recorded more overall activity counts, counts per minute, and steps compared with non-dog owners (Table 2). Associations between dog ownership and physical activity did not differ significantly between weekdays and weekends, summer and winter, boys and girls, or ethnic groups (data not shown). Dog ownership did not account for the ethnic differences in physical activity levels previously described in this study.¹⁰ Although participants who provided a single day of physical activity data (5%) were included in the analysis (to optimize participation rates), most children (89%) provided 3 or more days of physical activity data, and the exclusion of children who contributed fewer days made little difference to the results. Results were not materially affected by exclusion of the few children who reported cycling (not adequately measured by accelerometry) or swimming (when monitors were removed).

DISCUSSION

Our results suggest that children from households with a pet dog have higher levels of physical activity, measured objectively by accelerometry (which provides more accurate assessment of physical activity levels in this age group).^{14,15} However, in both adults and children, the extent to which physical activity differences reflected a causal influence of dog ownership or the self-selection of dog owning by more active individuals and families was difficult to establish.¹⁶ Longitudinal studies in adults before and after dog ownership suggest that dog owners become more active³; effects in children are unknown. The smaller effect size in children (360 steps/day; 4% difference) compared with that observed in adults (1700 steps/day; 25% difference)⁸ is unsurprising and suggests that children’s physical activity undertaken with a dog is likely to account for a smaller proportion of total physical activity than that for an adult responsible for exercising a dog.¹⁷

Our study (in a less affluent urban population) may have underestimated the potential influence of dog ownership on physical activity in a more affluent setting, where there may be better access and proximity to higher-quality

TABLE 1—Dog Ownership Status Overall and by Ethnic Group: Child Heart and Health Study in England, February 2006–February 2007

	Ethnic Group				Total
	White European	Black African-Caribbean	South Asian	Other	
Dog owner, no. (%)	114 (22)	28 (5)	13 (3)	47 (9)	202 (10)
Non-dog owner, no.	393	546	474	450	1863
Total, no.	507	574	487	497	2065

public open space,^{18–20} although the independent mobility of children in more affluent areas is not necessarily greater.²¹ Further work is needed to examine the influence of dog ownership in different social settings. In adults, the increased physical activity associated with dog ownership primarily reflects walking¹; the increase in children could reflect active play involving the dog and walking. We could not distinguish between these possibilities; further studies documenting the timing and nature of activities carried out with the pet dog would help to resolve this issue. ■

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Contributors

All authors contributed substantially to the origination and design of this brief. C. G. Owen drafted the brief and led the physical activity assessment with support from U. Ekelund, D. G. Cook, and P. H. Whincup. C. M. Nightingale and A. R. Rudnicka carried out the statistical analyses. P. H. Whincup conceptualized, raised funding for, and directed the Child Heart and Health Study in England with help from D. G. Cook. All authors had access to the data and approved the final version.

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Human Participant Protection

Ethical approval was obtained from the relevant Multi-Centre Research Ethics Committee.

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TABLE 2—Summary of Objectively Measured Activity Outcomes, by Child-Reported Pet Ownership, Comparing Non-Dog Owners With Dog Owners: Child Heart and Health Study in England, February 2006–February 2007

	Non-Dog Owners (n = 1606), Mean (95% CI)	Dog Owners (n = 178), Mean (95% CI)	Mean Difference (95% CI)	P (Difference)
Time, min, spent sedentary	573 (566, 580)	562 (546, 578)	-11 (-27, 5)	.17
Time, min, spent in light physical activity	176 (172, 180)	181 (175, 187)	5 (0, 10)	.04
Time, min, spent in moderate physical activity	47 (45, 48)	48 (46, 50)	1 (-1, 3)	.18
Time, min, spent in vigorous physical activity	22 (21, 23)	24 (22, 25)	2 (0, 3)	.04
Time, min, spent in moderate to vigorous physical activity	69 (66, 71)	72 (68, 75)	3 (0, 6)	.06
Counts	394 257 (387 611, 400 903)	412 490 (397 264, 427 716)	18 233 (2 969, 33 497)	.02
Counts/min	486 (478, 495)	511 (492, 530)	25 (6, 44)	.01
Steps	9 798 (9 642, 9 953)	10 155 (9 809, 10 501)	357 (14, 701)	.04

Note. CI = confidence interval. Analyses are adjusted for gender, age (in quartiles), ethnicity, socioeconomic position, day order of recording, day of the week, month of the year, and clustering effect of school. Socioeconomic status was available for 1784 children.

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