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Physical Activity, Well-Being, and Community Engagement: A Socioecological Examination of Volunteers Walking Shelter Dogs

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ABSTRACT

Background: The purpose of this work is to examine physical activity levels of volunteers who walk shelter dogs at an open-admission animal shelter in the southern United States. In doing so, shelter dog walking is presented as an activity of relational community engagement that can enhance well-being at all levels.

Methods: For this quasi-experimental study, a purposive sample of volunteer dog walkers in rural North Carolina was asked to record daily activity for a twelve-week period, with a total of 336 days submitted. Descriptive statistics and a paired-samples t-test were analyze the data.

Results: Data from a total of 336 days was collected. Paired-samples t-test was performed to compare outcomes assessed on days shelter dogs were not walked and days they were walked by volunteers. Significant differences were demonstrated for the steps taken ($t(154) = 9.5$, $p < .001$), the distance walked ($t(154) = 9.0$, $p < .001$), and the calories expended ($t(154) = 5.2$, $p < .001$).

Conclusion: The implications of these findings are multi-level and suggest walking shelter dogs can be a beneficial activity for all parties involved. At the micro-level, volunteers walked further, burned more calories, and accumulated more steps on days they walked shelter dogs. In turn, shelter staff and the local community benefited at the meso- and macro-levels, respectively.

Keywords: Exercise, Community engagement, Volunteers, Dogs, Walking, Health

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Introduction

Over the past 20 years, dog walking research has documented benefits to both the dogs and the humans, reflecting the importance of human-animal interactions for health and well-being at multiple levels and in various contexts. Recognizing the importance of enrichment activities for dogs housed in animal shelters, some works have noted the benefits associated with walking shelter dogs. Within older populations, for example, walking shelter dogs is suggested to be a motivator for engaging in physical activity (Harvey et al., 2024). Physical and emotional benefits have been demonstrated from walking shelter dogs in other populations as well (Sartore-Baldwin et al., 2019, 2021). Shelter dog walking has also been used as a successful therapeutic tool to reduce stress in specific populations such as veterans with post-traumatic stress disorder (PTSD) (Krause-Parello et al., 2019).

While research projects assessing the outcomes of walking shelter dogs are important for advancing the literature, it is crucial to note that enrichment activities are a daily necessity for shelter animals' well-being (Mellor et al., 2020). Ideally, shelters are staffed such that staff members can engage in these activities, but the numerous constraints to publicly funded, municipal animal shelters often leads to a reliance on volunteers to do these activities (Guenther, 2017). Thus, engaging with the local community to invite volunteers to participate is integral to achieving and maintaining positive well-being outcomes. Employing a socio-ecological lens allows for these outcomes to be examined and interpreted for not only the volunteers who walk the dogs, but also the dogs, the shelter staff, and the community.

The socio-ecological model (SEM), derived from systems theory, allows researchers to examine the micro-, meso- and macro- domains and the relationships and interdependencies among individuals, groups, communities, ideological belief systems, and institutions within and across these domains (Kilanowski, 2017). Using this model, Wünderlich et al. developed an Interactive Welfare Framework to examine the relationships between consumers, animals, and the communities they form (Wünderlich et al., 2021). Specifically, this framework is based on the premise that human-animal relationships are important to micro-, meso-, and macro-level well-being in specific contexts where animals are present in our lives. An extension of the One Health (Carver, 2022) and One Welfare (Lindenmayer & Kaufman, 2021) initiatives, the Interactive Well-Being Framework focuses on communities, the interest of those within communities, and the manner to which these interests shape well-being. While the Interactive Well-Being Framework has been applied to specific contexts in which animals are present (Wünderlich et al., 2021), the model has not been used to examine a context in which animal well-being is increasingly a concern – open admission animal shelters.

Approximately, 334,000 dogs and 273,000 cats were euthanized in shelters across the United States in 2024 (ShelterAnimalsCount, 2024). Within the state of North Carolina, shelters reported euthanizing 23,636 animals and ranked second in the nation for the percentage of animals euthanized (*North Carolina*, n.d.). These euthanasia statistics reflect deaths at both non-profit, private shelters and open-admission, publicly funded municipal animal shelters, but the latter have higher intake numbers, more stray animals, higher euthanasia rates, and fewer adoptions than the former (Reese, 2024). As a result of these higher numbers, caring for the animals in these facilities can be a difficult task. This is particularly the case when employing the National Animal Care and Control Association (NACA) standard guidelines for staffing that allocates only 15 minutes per day per animal in their formula (i.e., *number of animals X 15 minutes = total minutes of staff time*). The 15 minutes allows nine minutes for cleaning and six minutes for feeding. While these duties are important, a lack of focus on enrichment within the shelter environment can diminish the care and welfare of

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the animals.

The Association of Shelter Veterinarians (ASV) provides guidelines for welfare and care in shelters in the United States. Historically these guidelines have centered around The Five Freedoms which include freedom from hunger and thirst, freedom from pain, injury, or disease, freedom to express normal behavior, and freedom to not experience fear and distress (Newbury et al., 2010). Recently, the ASV used The Five Freedoms as the foundation from which they developed a more holistic approach to animal welfare and care called The Five Domains Model (Veterinarians, 2022). Specifically, this model locates things like nutrition, environment, and physical and mental enrichment activity opportunities as domains in which the needs can be met to increase wellbeing in shelter animals. Given the conflicting guidelines for staffing and animal care in the animal shelter environment, it is often difficult for staff to find time to engage in enrichment activities with the animals. As a result, volunteers can become a valuable resource as they can engage in many daily activities to assist with the care of the animals. Indeed, most municipal animal shelters become somewhat reliant on volunteers for numerous organizational tasks, including activity-based enrichment activities such as walking (Guenther, 2017).

Methods

Pitt County Animal Services is in Greenville, North Carolina in the United States. Greenville is a town with a population of 90,856 people and serves as the county seat of Pitt County, a county with a population of 173,542 people. The population of Greenville, NC, USA has a median household income of $59,946 and a 57.7% employment rate. Data from the county shows that, in 2006, 3247 live animals entered the Pitt County Animal Services, of which 39% left the shelter alive. In 2023, 1943 live animals entered the shelter, of which 82.5% left the shelter alive. This is a vast improvement that has driven the goal of attaining and maintaining no-kill status. As an open-admission, municipal facility, the shelter takes in strays, owner surrenders, and houses animals involved in court cases, as space allows.

Members of the Mutt Strutter volunteer dog walking group are from the local community and meet daily to walk shelter dogs housed at Pitt County Animal Services. The group was founded under the guise that walking shelter dogs is beneficial to all people involved and was promoted as a way for humans to obtain physical activity while also giving back to the community. While dog walking has been found to be beneficial for both dog owners and their companion animals (Potter et al., 2021), limited research has assessed walking shelter dogs in open-admission, municipal shelters, likely due to the stigma associated with, and the highly emotional context of the setting (Tallberg & Jordan, 2022). Within the shelter environment; however, the benefits of dog walking can occur at all levels. With this in mind, the Mutt Strutter group was formed so that shelter dog walking would 1.) provide physical activity and enrichment for both humans and dogs, 2.) aid shelter staff by engaging with the dogs in a way that the NACA formula does not allow, and 3.) create an opportunity for community members (i.e., volunteers) to become actively engaged in addressing the problem of pet overpopulation in their community and beyond.

Participants

A purposive sample was used for this quasi-experimental study. Criteria for inclusion was being a member of the Mutt Strutter walking group at the local open-admission, municipal animal shelter. To be a member of the group, one must complete the liability paperwork and go through an orientation session. The group has had hundreds of people go through the introductory orientation, many of whom never return. Fifteen volunteers (87% female, 13% male; ages 25 – 73 years old) agreed to participate in this study. Fourteen volunteers identified as White and one identified as Latinx. Most volunteers reported being involved in Mutt Strutters for less than one year who walked anywhere from one to seven times per week.

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Procedures

Volunteers were recruited through the walking group's private Facebook page and word of mouth. Despite the hundreds of people who have gone through the orientation required to join the group, the number of walkers each day can range from three to thirty. Those participants who were members of the social media group and those who regularly attended walking sessions were more likely to be participants in the study compared with other members. Participants were asked to volunteer for the study and were assured there was no obligation to do so, confidentiality would be upheld, and that they could leave the study at any time.

To assess physical activity levels within the group, participants were asked to wear a Fitbit (Inspire 2) for twelve weeks. The Fitbit 2 is a commercially available fitness tracker that utilizes a variety of health monitoring features including heart rate monitoring, physical activity tracking, and sleep monitoring. The Fitbit 2 device tracks physical activity using the built-in sensors of an accelerometer and gyroscope and assesses steps taken, distance traveled, and calories burned. Furthermore, Fitbits demonstrate validity in measuring steps on a short time scale compared to an ActiGraph accelerometer (Delobelle et al., 2024).

Participants were asked to attend walking sessions as they were able and recorded daily activities regardless of whether they walked shelter dogs or not. There were no requirements for the number of walking sessions each week or the duration of the walks they took. Daily screenshots of their activity were emailed to the investigators using an email address specifically constructed for the purpose of the study. Those who volunteered were also asked to provide their demographic information (e.g., age, ethnicity, gender expression) and their duration of time belonging to the group with their first screenshot.

Analysis

Descriptive statistics were used to examine demographic information and physical activity measurements. Sums, means, and standard deviations were calculated for the number of steps taken, the distance walked, and the calories burned. A paired-samples t-test was finally performed to compare group outcomes.

Results

Walking data from 336 days was collected. Of these, 181 (54%) were submitted from the days volunteers did not walk shelter dogs, and 155 (46%) were submitted from days volunteers did walk the shelter dogs. Nearly half (46%) used walking shelter dogs as their only source of daily physical activity. Across all the 336 days, volunteers accumulated 3,460,893 steps, 1522 miles, and expended 784,202 calories. Volunteers averaged 10,300 (SD = 3432.9) steps, 4.5 (SD = 1.57) miles, and 2334 (SD = 550.9) calories burned across all days as well. On the days the volunteers walked the shelter dogs, they averaged 12,127 (3095.5) steps, 5.4 (SD = 1.48) miles, and burned 2491.5 calories (SD = 625.4). On the days the volunteers did not walk shelter dogs, they averaged 8736 (SD = 2898.6) steps, 3.8 (SD = 1.29) miles, and burned 2199 (436.6) calories (Table 1).

Table 1. Sums, means, and standard deviations for days volunteers did and did not walk shelter dogs

	Sum	Total N = 336		At the shelter N = 155		Not at the shelter N = 181	
		M	SD	M	SD	M	SD
Steps	3,460,893	10,300	3432.9	12,127	3095.5	8736	2898.6
Distance (miles)	1522	4.5	1.57	5.4	1.48	3.8	1.29
Calories burned	784,202	2334	550.9	2491.5	625.4	2199	436.6

After confirming normal distribution through a Q-Q plot, between-group means were compared. Steps taken on days shelter dogs were walked (M = 12126.7, SD = 3095.5) was significantly different

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from steps taken on days shelter dogs were not walked (M = 8709.1, SD = 3011.8); $t(154) = 9.5$, $p < .001$. Cohen's d was .76 indicating a medium effect. Distance walked on days shelter dog was walked (M = 5.3, SD = 1.5) were significantly different from the distance walked on days shelter dogs were not walked (M = 3.9, SD = 1.3); $t(154) = 9.0$, $p < .001$. Cohen's d was .72 indicating a medium effect. Calories expended on days shelter dog were walked (M = 2491.2, SD = 625.4) was significantly different from calories expended on days shelter dogs were not walked (M = 2185.1, SD = 462.7); $t(154) = 5.2$, $p < .001$. Cohen's d was .42 indicating a small effect (Table 2).

Table 2. Paired-samples t-test for the days volunteers did and did not walk shelter dogs

	Walked shelter dogs		Did not walk shelter dogs		*t*(154)	*p*	Cohen's *d*
	M	SD	M	SD			
Steps	12126.7	3095.5	8709.1	3011.8	9.5	<.001	.76
Distance	5.3	1.5	3.9	1.3	9.0	<.001	.72
Calories	2491.2	625.4	2185.1	462.7	5.2	<.001	.42

Discussion

The purpose of this work was to examine the physical activity of volunteer shelter dog walkers at a municipal, open-admission animal shelter as an activity of community engagement. In doing so, a systematic approach provided the opportunity to provide multi-level insights. At the micro level, the volunteer shelter dog walkers in this study took more steps, walked further distances, and burned more calories on days they walked shelter dogs than days they did not walk them. This is consistent with the current dog walking literature that focuses on dog owners; however, these findings also extend the literature to the volunteer and animal shelter realms. There is growing support for the utility of dog walking to assist adults in being physically active, and the current findings suggest that walking shelter dogs may also serve as a notable source of daily physical activity. On days volunteers walked the dogs, they surpassed the 10,000 steps per day recommended by the Centers for Disease Control and validated by Paluch et al. (Paluch et al., 2022), demonstrating the potential effectiveness of shelter dog walking in helping to promote positive well-being outcomes associated with meeting physical activity guidelines. While data for the physical activity levels of the shelter dogs was not collected, dog walking has been demonstrated to be beneficial for shelter dogs as well, both physically and mentally (Friedmann et al., 2021; Mellor et al., 2020).

Walking a dog who is not one's own is different from walking one's pet, particularly within the open-admission animal shelter environment where euthanasia is a certainty. Volunteering to walk shelter dogs is a unique activity that serves a different purpose than the traditional act of a dog owner walking their pet. Westgarth et al. (Westgarth et al., 2021) identified two distinct types of dog walks performed by dog owners: functional and recreational. Functional walks are typically performed out of guilt and, as such, the experience feels like a chore. Recreational walks are performed as a collaborative effort between dog and owner, provide an opportunity for bonding, and can be therapeutic in nature. While it could be argued that walking shelter dogs can take both functional and recreational forms, it is perhaps more helpful to view walking shelter dogs as a unique experience that is more purposive in nature. Thus, these purposive walks provide activity-based enrichment to dogs that may otherwise not get a chance to get physical activity each day.

Research has found that dog owners walk their dogs for both physical and mental health benefits, however volunteers who walk shelter dogs in open-admission shelters put themselves in a position where they may ultimately experience negative mental health outcomes (Jacobs & Reese,

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2021; McNamee & Peterson, 2016). In this way, positive and negative well-being outcomes may be at odds, combined, and even intertwined. Dedicated volunteers within the animal welfare community are referred to as "high stakes volunteers" (HSVs), due to the unique commitment they demonstrate toward shelter animals who are at risk for euthanasia (McNamee & Peterson, 2016; Reese, 2024). Within the animal welfare context, HSVs are deemed such due to the significant responsibilities, intense care provided, emotional relationships formed, and long-term commitment required (McNamee & Peterson, 2016; Reese, 2023). Further, their exposure to euthanasia, the effects of human neglect and cruelty to animals, large numbers of animals in need, and human distress may make them more susceptible to compassion fatigue (Rank et al., 2009). Compassion fatigue is comprised of two factors: burnout and secondary traumatic stress (Figley, 1995) and can emerge as volunteers repeatedly "take on" the trauma or traumas and stressors experienced by the animals.

Taking on these traumas suggests volunteer dog walkers and shelter dogs form relationships, a key component to the Interactive Well-Being Framework. To the extent that these relationships are positive, they can facilitate volunteer longevity and provide them the opportunity to learn about and individualize the dogs and, in doing so, additional well-being outcomes at the meso and macro levels may also occur. When volunteer dog walker and shelter dog relationships lead to compassion fatigue, implications for animal shelter initiatives at the meso level that focus on volunteer retention and well-being become increasingly important (Jacobs & Reese, 2021).

While the current findings are from a relatively small sample of people, the data from the days walked provide some hope that linking physical activity, well-being, and community engagement has important implications for shelter environments. To the extent that trustworthy and reciprocal relationships exist between the shelter staff and volunteers at the meso-level, positive multi-level outcomes can be obtained and maintained in a long-term manner (Redvers et al., 2024). In the current study, these outcomes included well-being evidenced by the interdependencies between the micro, meso, and macro-levels of the open admission shelter setting studied (Wünderlich et al., 2021). Specifically, from a micro-level perspective, both volunteers and dogs obtained a notable amount of physical activity. At the meso-level, volunteers were able to assist the shelter staff by carrying out enrichment activities they likely do not have the time to perform. From a macro-perspective, the community benefited from having a core group of volunteers dedicated to the well-being of the homeless animals in their county and beyond.

Conclusion

The purpose of this work was to examine the physical activity levels of volunteers who walk shelter dogs at an open-admission animal shelter in the southern United States. In doing so, shelter dog walking is presented as an activity of relational community engagement that may enhance well-being at all levels. Findings suggest that walking shelter dogs can assist in meeting daily physical activity needs for humans and provide enrichment for the shelter dogs. In doing so, human and shelter dog well-being is being enhanced at the micro level. Adopting an interactive and socio-ecological approach allows for the interpretation of findings at additional levels and identifies that walking shelter dogs also assists shelter staff at the meso level and the community in which the shelter is housed at the macro level. These findings suggest that shelter dog walking can be a beneficial activity for all the individuals involved.

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Conflict of Interest

The authors declared no competing interests.

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Ethical Considerations

Permission was granted from the Director of the local county animal shelter to assess the study's purposes relative to their volunteer dog walking program, Mutt Strutters. Upon receiving Institutional Review Board approval from the University and Medical Center (UMCIRB 22-001571), all participants were informed of the purpose of the study, their roles and requirements, and how long they would be asked to take part. Upon agreeing, each participant signed the required informed consent document and filled out a questionnaire whereby demographic information was collected.

Code of ethic

UMCIRB 22-001571

Authors' Contributions

Conceptualization was done by M.S., B.D.; Data curation by M.S.; formal analysis by M.S.; methodology by M.S., B.D.; writing by M.S., Reviewing by M.S., B.D.; editing by M.S., B.D.

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