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Dog-Associated Road Safety Concerns: A Pre-COVID Survey of New Zealand Pet Owners

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Abstract: Aims: To investigate the road safety concerns associated with pet dogs in New Zealand. Methods: An online survey was developed and offered to New Zealanders via SurveyMonkey© from 8 January 2019 to 31 March 2019) using New Zealand residents aged ≥ 18 years. Questions about the demographics of respondents and their number of pet dogs along with those about dog transportation and dog roaming were asked. Results: Of 2744 respondents who completed the online survey, 1494 (65%) owned a dog. Of the total respondents, 1511 completed the question about how their dog or dogs travel in vehicles. Of these, 2% (n = 29) let their dog sit on the driver's knee, and 12% (n = 179) allowed their dog to sit on the passenger's knee. Only 7% (n = 105) allowed the dog to roam free throughout the vehicle, while 44% (n = 663) allowed their dogs to roam free in the backseat area only and 19% (n = 280) put their dog in the boot/hatchback area. A minority of respondents (2%, n = 22) indicated they let their dog travel unrestrained on the deck of a ute or truck. Approximately half, 51% (n = 767), of the respondents indicated that they restrained or crated their dogs in or on the vehicle. Respondents also expressed concerns about roaming dogs being a road safety hazard with the themes of responsible ownership, physical and psychological harm, and the dangers of rescue altruism emerging. Conclusions: Increased awareness about proper pet restraints during transportation and preventing dogs from roaming, especially near and on roads, is crucial to ensure traffic safety for humans and dogs.

Keywords: Aotearoa; New Zealand; attitudes; car; companion animal; safety; dog–owner relationship; regulation; restraining

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1. Introduction

In New Zealand (NZ), approximately 34% of households own at least one dog, with a five percent increase in dog ownership reported between 2011 and 2020 [1]. Globally, companionship is the primary reason for the global spread of pet ownership [2,3]. In NZ, the majority of pet owners consider their dogs to be family members and report that they spend considerable amounts on their care [4]. As pet ownership rises, owners' and pets' health and well-being become increasingly significant [5,6]. Studies suggest that pet ownership, particularly dogs, may positively affect human health [7,8]. Meta-analyses indicate that pet ownership is associated with increased physical activity levels [7] and reduced physiological and subjective stress responses [9]. Demographic factors such as household size, the number of children in the family, location, education level, and income influence dog ownership rates [10,11]. Forrest et al. [12] found that increasing age, household income, and household number of children increased the likelihood of owning a dog, while increasing qualification (education) level and living in a town/city decreased the likelihood of owning a dog. Disparities in dog ownership are not only evident between urban and rural areas within NZ but also across international contexts like the United States of America (USA), India, Tanzania, Mexico, Zambia, and Chile [13–18]. Interestingly,

Forrest et al. [12] found that males and those with a rural upbringing were less likely to consider dogs part of the family, as were older adults and those with a higher level of qualification (education).

The evolving role of dogs as family members influences travel behaviour and pet care practices, highlighting the need for enhanced safety measures during car transportation [19–23]. Despite awareness of the risks associated with unrestrained pets in vehicles, many pet owners do not use proper restraints, contributing to distractions and potential hazards on the road [24,25]. In the USA, approximately 28% of pet owners report riding with a pet at least once a month; 30% of those driving with pets in the vehicle admitted to being distracted [24,26]. Pets can distract drivers and become projectiles during accidents [27]. Roadside observational studies found that 32.7% of drivers were distracted, with passenger interaction, phone use, and external distractions being the most common [25]. Distraction-prone drivers are more likely to engage in risky behaviours [28]. Thus, dog transportation in vehicles represents a significant health and safety risk. Dog transportation practices and pet owner attitudes to road safety were explored as part of a larger study Furry Whānau Wellbeing research study, funded by New Zealand Companion Animal Trust (NZCAT), and are reported here [12]. In addition, pet owner attitudes about roaming dogs associated with road safety were also explored.

2. Materials and Methods

The current research data were collected as part of the 2018–2019 Furry Whānau Wellbeing research project, with ethical research approval obtained from the Eastern Institute of Technology (EIT) Research and Ethics Approval Committee (REAC ref 19/53). The online survey was developed in consultation with Māori (indigenous people on NZ) and offered in te reo Māori (Māori language) and English. The participants, survey questions, and data collection methods are described in detail [12]. The online survey was open from 8 January 2019–31 March 2019. The question specific to dog transportation was Question 21, which asked:

When travelling in your vehicle, your dog/s are (tick all that apply): I don't have a vehicle, Allowed to sit on the driver's knee, Allowed to sit on the passenger's knee, Unrestrained and free to go anywhere, Unrestrained but must remain in the back seat, Restrained using an animal harness, Put in a crate or animal carrier, Put in the boot, Unrestrained on the deck of a ute/truck, Restrained on the deck of a ute/truck, Other (please specify).

A forward stepwise binary regression was used to explore if gender (female, male), ethnicity (Māori, NZ European, Other), age (18–24 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years, 65–74 years, 75–84 years), income range (<NZD 14,000, 14,001–48,000, 48,001–70,000, 70,001–100,000, >100,000, would rather not say), qualification (education) level (1–10), being brought up rurally (yes, no), currently living in a town (yes, no), the number of children, and/or whether the number of adults present in the household impacted on whether or not a dog was transported safely (restrained, crated, or in an animal carrier). Respondents were not required to answer all the questions (including those about demographic factors) and were provided the option to skip questions as desired. All statistical analyses were done using IBM SPSS Statistics (version 25) software.

In response to Question 40. Do you think that roaming pet dogs and cats are a problem? Yes, No, Never thought about it and Question 41. If yes, please explain why. Some respondents expressed road safety concerns. These narrative responses were analysed thematically using an inductive approach [29].

3. Results

A total of 1511 people responded to the question about how their dog or dogs travel in vehicles. Approximately half, 51% (n = 767) of the respondents indicated that they restrained or crated their dogs in or on the vehicle. Of the remaining 49%, 44% (n = 663) allowed their dogs to roam free in the backseat area only and 19% (n = 280) put their dog in

the boot/hatchback area, while 12% (n = 179) allowed their dog to sit on the passenger's knee and 2% (n = 29) let their dog sit on the driver's knee. Only 7% (n = 105) allowed the dog to roam free throughout the vehicle. A minority of respondents (2%, n = 22) indicated they let their dog travel unrestrained on the deck of a ute or truck.

Of the respondents, 1155 could be used in the binary regression analysis for whether or not the respondent safely transported their dog/s (yes, no). Qualification (education) level (odds ratio 1.103, $p < 0.001$) and number of dogs (odds ratio 1.146, $p = 0.032$) were retained in the model. The higher the qualification (education) number and the larger the number of dogs, the greater the likelihood of safe transportation.

Of those who selected "Yes" that they considered roaming pets an issue, 1479 provided an explanation. The themes of physical and psychological harm, responsible ownership, and the dangers of rescue altruism emerged. Many respondents noted that roaming dogs "...pose a threat to both their own and the public's safety. Particularly within cities and larger towns, dogs and cats can be hit by cars..." and that dogs "Can be a road hazard...Cause an accident". Similarly, roaming dogs were viewed as a road hazard in the rural setting as well, with one respondent sharing that "They [dogs] also lie on the main gravel roads. This means drivers are at risk of hitting the dogs and causing a possible car accident from attempting to miss the dogs. This is an issue". Other respondents worried about the psychological impact on the occupants of a vehicle who injure a roaming pet, saying it can be "... horrid for people who might hit them with cars ..." potentially causing "... mental harm if you accidentally ran a pet over", with these sentiments being further reflected in this quote "... Both cats and dogs can be easily run over by vehicles = undue stress on drivers".

Several respondents emphasised the need for responsible ownership and control of dogs to mitigate the risk to both animal and human welfare, a sentiment which is captured in the following quotes: "[roaming dogs] Cause traffic accidents, cause issues for other pets, can damage property and other animals, lead other animals into roaming behaviour, owners should be prosecuted", "Dogs: at risk of being accidentally killed/injured [on the road], ... roaming dogs may be indicative of lack of responsible dog ownership ...". One respondent concluded that "All pets should have a home and be looked after properly. It's sad to see pets roaming. Could be run over by traffic & will be scared & hungry".

In addition to roaming dogs, well-meaning members of the public who try to help the roaming animal may also be a traffic hazard. Respondents said that they do it because "Because they [roaming dogs] might get hurt! I've picked up a few wandering doggos in my work car which very nearly got hit by cars", with one respondent saying, "I have found and returned approx 10 dogs in the last year since living in the city! I am mainly worried for the dog's safety, especially around roads".

Thus, the respondent raised several issues associated with roaming dogs in relation to road safety along with human and animal welfare.

4. Discussion

The transportation results reported here highlight that half the dog-owning respondents transport their pets without proper restraints, which is very concerning. This result is similar to that observed in the USA, where a little under half of the respondents (45%) did not restrain their dogs during transportation [30]. In contrast, in Australia and the United Kingdom (UK), 33% and 28% were observed, respectively, with the most common reason being that the respondents did not think it was necessary [28]. It was noted that the regulations regarding dog transportation in private vehicles were more robust in the UK compared to the USA [28]. Therefore, it was not surprising that country was a significant factor in whether dogs were unrestrained in private vehicles, along with dog size and age, owner age, and vehicle type [30]. In European Union countries, all pets, including dogs, need to be secured when transported in a private vehicle: for example, using partitions, transport boxes, or seat belts according to Section 23 of the Road Traffic Act (§ 23 StVO) [31]. Although the present study did not explore dog characteristics such as age and size or

vehicle type, interestingly, in this study, dogs were more likely to be restrained during transportation with increasing qualification (education) levels and number of dogs. Age was likely to have been confounded with qualification (education) level, and therefore, an association was not detected. Nevertheless, the association with qualification (education) level suggests that many dog owners may lack education and be unaware of the potential risks associated with unrestrained pets in vehicles.

Consistent with these findings, previous research indicates widespread non-compliance with pet restraint recommended practices and laws during car travel [20,27]. Previous research has found that cultural and regional factors significantly influence pet owners' attitudes toward pet transportation. For instance, rural pet owners may be less likely to use restraints due to perceived safety on rural roads or limited exposure to safety information about pet travel [32]. As typical of self-selected online surveys, the survey sample was not representative of the NZ population and had an over-representation of white females [10], and therefore, such associations may not have been as evident in the data. Nevertheless, as highlighted by Hazel et al. [30], tailored educational campaigns that account for these variations are crucial for promoting safer practices across diverse communities. Furthermore, other research has revealed a disparity between pet owners' awareness of pet safety and their actual practices [10,33,34]. This gap highlights the need for targeted education initiatives and interventions to align attitudes with safer practices, similar to efforts in agriculture safety [35]. In addition, pet-related driving laws vary globally, for example, with significant differences in regulations between countries such as Australia, the USA, and the UK [30]. Addressing these disparities through cohesive policies and regulations, supported by collaborations among governmental agencies, animal welfare groups, and the automotive industry, could improve safety standards globally.

Studies investigating the correlation between pet transportation and motor vehicle collisions (MVCs) have yielded varied results. Although some studies found no significant increase in MVC rates for pet owners who drive with pets [24,25]. Others reported the highest risks, particularly among older drivers who consistently transport pets [24,25]. Research also identifies demographic factors such as age and gender differences as influencing crash involvement patterns, with young males more often implicated in collisions [36,37]. The necessity of securing dogs in vehicles to prevent distractions and mitigate accident risk remains paramount [27]. Hazel et al. [30] also highlight that as well as a lack of restraint in vehicles precipitating traffic accidents through driver distraction that unrestrained dogs may also increase the risk of injury during an accident. The authors conclude that there is "...the need for improved education and information regarding the use of restraints for dogs traveling in vehicles, ..." (p. 1).

Unrestrained dogs outside a vehicle also pose a road safety risk. Animal-vehicle collisions pose significant risks to both humans and animals, with dogs frequently involved, particularly in urban areas and during low-light conditions [38,39]. Animal-vehicle collisions are also a significant cause of road trauma in regional and remote areas where fatality rates are double those in urban regions [40–42]. These incidents endanger drivers and also lead to substantial economic costs [43]. Wildlife rehabilitation centres frequently treat animals injured in these collisions, with the highest number of cases occurring in spring [44]. Efforts to mitigate these animal-vehicle collisions include infrastructure improvements, such as animal crossings, and public awareness campaigns [45]. Furthermore, attempting to rescue animals from roads can be extremely dangerous, sometimes resulting in human injuries and fatalities [46,47]. Therefore, the concerns raised about roaming dogs in this study are reflected in the wider research and support tighter regulations and law enforcement regarding keeping dogs safely contained within their owner's property.

Collectively, the evidence indicates that consistent regulations regarding dog transportation and improved education play a vital role worldwide in behaviour change and safety promotion. Prior studies demonstrate that awareness campaigns effectively reduce risky behaviours in various contexts [48]. Similar strategies aimed at educating pet owners

about the dangers of unrestrained pets during car travel and roaming dogs could yield positive road safety outcomes by increasing awareness and offering practical solutions.

5. Conclusions

The Furry Whānau Wellbeing research study has shed light on road safety issues in NZ associated with dogs not being safely contained, whether in a car or on their owner's property. The findings emphasise the need for targeted education and awareness campaigns to promote pet restraint and carrier use in vehicles and address free-roaming dogs to improve road safety. Standardised guidelines for safe transportation and increasing awareness about laws in NZ that require responsible dog containment practices inside and outside vehicles are tangible steps toward better road safety for pets and humans.

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