

Article

Canadian dog owners' use and perceptions of cannabis products

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Abstract – The legal market for recreational and medicinal cannabis for human consumption is growing worldwide. At the same time, marketing of cannabis products for use in pets is expanding. Yet, there is little research exploring the effects of cannabis use in veterinary medicine. This study used an anonymous, online survey to assess Canadian pet owners' reasons for purchasing cannabis products for their dogs, and their perceptions regarding efficacy of these treatments. Owners purchased cannabis products for treatment of pain, inflammation, and anxiety in dogs, and perceived these preparations to be equally or more effective than conventional medications. Most owners reported only minimal side effects in their dogs. Despite indicating comfort in discussing canine cannabis administration with their veterinarian, most owners relied on commercial websites for product information. The main reasons for choosing cannabis products were the ability to use as an adjuvant to other therapies, and the perception of it being a natural substance. Given this information, it is incumbent upon veterinarians to appropriately counsel their clients, and also to advocate for evidence-based studies to evaluate the efficacy of cannabis use in non-human species.

Résumé – Usage du cannabis et perceptions à l'égard de ce produit parmi les propriétaires canadiens de chiens. Le marché légal pour le cannabis récréatif et médicinal pour la consommation humaine affiche une croissance à l'échelle mondiale. La commercialisation des produits de cannabis pour utilisation chez les animaux de compagnie connaît une croissance. Pourtant, peu de travaux de recherche ont exploré les effets de l'usage du cannabis en médecine vétérinaire. Cette étude a mené un sondage en ligne anonyme pour évaluer les raisons des propriétaires canadiens d'animaux de compagnie d'acheter des produits de cannabis pour leurs chiens et leurs perceptions concernant l'efficacité de ces traitements. Les propriétaires ont acheté des produits de cannabis pour le traitement de la douleur, de l'inflammation et de l'anxiété chez les chiens et ils percevaient ces préparations comme étant tout autant ou plus efficaces que les médicaments conventionnels. La plupart des propriétaires ont signalé des effets secondaires minimaux chez leurs chiens. Malgré avoir indiqué de l'aise pour la discussion de l'administration de cannabis à leur chien avec leur vétérinaire, la plupart des propriétaires se fiaient à des sites Web commerciaux pour obtenir de l'information sur les produits. Les principales raisons pour le choix de produits de cannabis étaient la capacité de l'utiliser comme adjuvant pour les autres thérapies et la perception que c'était une substance naturelle. Compte tenu de ces renseignements, il incombe aux vétérinaires de bien conseiller leurs clients et aussi de préconiser des études factuelles pour évaluer l'efficacité de l'usage du cannabis chez des espèces non humaines.

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Introduction

Although cannabinoid use is a current hot news topic, it has been used for centuries and was first studied in the early 1800s by Sir William B. O'Shaughnessy (1). Cannabis can take the form of either hemp or marijuana, and both are derived from the plant *Cannabis sativa*. Marijuana typically refers to the psychotropic drug used for medicinal or recreational purposes.

It usually contains high levels of THC (delta-9 tetrahydrocannabinol) which leads to its psychoactive effects. In contrast, hemp is cultivated primarily for use in the production of foods and beverages, personal care products, nutritional supplements, and fabrics. The strains used for this purpose often have low levels of THC and high levels of cannabidiol (CBD), and thus do not have psychoactive effects (2). The rules and regulations

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for CBD and marijuana are different with each having separate statutory definitions (3).

Due to these rules and regulations, it has been challenging to conduct scientific studies evaluating the medicinal effects of cannabis. Yet, there have been a handful of controlled clinical trials with cannabinoids. The German Medical Association, for example, found cannabinoid treatment beneficial for a number of medical conditions and suggested that the use of cannabinoids may be a reasonable alternative for patients when conventional treatments do not achieve adequate relief of symptoms including pain, nausea, vomiting, or loss of appetite (4). A recent double-blinded (owner and veterinarian) clinical trial conducted by researchers from Cornell and Colorado State Universities found that a 2 mg/kg body weight (BW) dose of CBD oil was more effective at controlling signs of osteoarthritis than the placebo formulation (5). Other studies have found evidence supporting the therapeutic benefits of cannabinoids for pain, inflammation, cancer, asthma, glaucoma, spinal cord injury, epilepsy, hypertension, multiple sclerosis, Parkinson's disease, Alzheimer's disease, nausea and vomiting due to chemotherapy, weight loss in HIV, sleep disorders, and Tourette syndrome (6,7). In part due to these promising results, the National Institutes of Health website includes information about cannabinoids' potential to reduce opioid use and overdose (8).

Unsurprisingly, given these positive study results, the global market for legal cannabis has been identified as one of the fastest growing industries. Several countries including Canada, Australia, Greece, Croatia, Israel, Poland, Mexico, Finland, Turkey, the Czech Republic, Switzerland, Macedonia and Italy, Germany, Peru, Uruguay, the Netherlands, and Jamaica have legalized cannabis-based medicines (9). In Canada, the Industrial Hemp Regulations were instituted in 1998, permitting companies to grow and process hemp products for commercial purposes (10) with approximately 1830 currently active industrial hemp licenses (11).

Worth \$7.7 billion at the end of 2017, the global market for legal cannabis is projected to reach \$31.4 billion by 2021. While the United States currently accounts for 90% of the market share, this is expected to decrease because of legislative changes in Canada (12). Canada is considered one of the largest markets for cannabis products, and the Canadian Senate passed the "Cannabis Act" on June 21, 2018, giving provinces the ability to set their own rules and regulations (13). Thus, the US domination of the market is projected to decrease to approximately 57% in the coming years (Financial buzz) (14). The market for legal cannabis in Canada is expanding rapidly. First legalized in 2001, medical marijuana has rapidly increased in popularity. From March 2017 to September 2017, the number of people registered to use medical marijuana increased by 40% (15) and 41% of adult Canadians report having used cannabis at some point in their lives as of 2016 (16).

Humans are not the only species that appears to benefit from cannabis products, as demonstrated by an increasing interest in cannabinoids for animals as well (6). Numerous companies now market biscuits, edibles, and capsules containing non-psychoactive cannabinoid compounds (e.g., CBD) to pet owners (17–19). Sales of cannabis products developed for pets increased

by 1000% between September 2016 and 2017, with stock in these companies rising 122% between January and September 2017 (20). Recently, 3 publicly traded cannabis companies announced plans to begin selling cannabis pet products (Medical Marijuana Inc., Stony Hill Corp. and Vet Online Supply Inc.) with more companies set to follow (21).

Yet, there is still only a handful of published studies examining the clinical use of cannabinoids in veterinary medicine. Most papers published on animals and cannabinoids have focused on marijuana poisoning and its treatment rather than on therapeutic applications (22,23). One medical use for cannabinoids in companion animals that has been studied is its use as a topical treatment of glaucoma. Other potential medical uses of cannabinoids under investigation in veterinary medicine include inflammation, pain treatment, oncology, and dermatological conditions (6). Some recent studies have found that cannabinoids are a suitable treatment for canine osteoarthritis, immune-mediated and inflammatory disorders, and epilepsy (24–26). Current research at Colorado State University (USA), for example, involves investigating the effects of CBD on canine arthritis and epileptic seizures (27).

Because cannabis is classified as a Schedule 1 controlled substance under Federal law in the US, its use, sale, and possession are illegal at the Federal level. Schedule 1 status creates strict limitations on clinical research, severely impeding the ability to help educate clinicians and pet owners about its benefits and risks from an evidence-informed perspective. While CBD is classified as a Schedule 2 drug in Canada with fewer restrictions, both countries have limitations for scientific research, hampering the ability of researchers to conduct investigations into its benefits and risks (28). To help address this need, Canada has initiated a national research agenda which includes collaboration of several entities including The Canadian Centre on Substance Use and Addiction Expert Advisory Group on Cannabis, Health Canada, the Canadian Institutes of Health Research, the Canadian Academy of Health Sciences, Public Safety Canada and the US National Institute on Drug Abuse — International Program to provide evidence-informed advice and analysis on the health impacts of cannabis (29). While limited data exist for cannabis use in humans, even less data exist on the use of cannabis products for animals. The Canadian Veterinary Medical Association (CVMA) states that further research is recommended to understand the safety and effectiveness of medical marijuana or CBD products for animals. Veterinarians are not allowed to prescribe any of these products for pets given the fact that these products may have unknown side effects and unproven effectiveness (30).

This has not stopped pet owners from giving their pets cannabinoid treatments on their own, but this is not without risk — as illustrated by a study on marijuana toxicosis (22). As the use of cannabis for both humans and pets has become more common, the rate of overdose or toxic levels in pets has increased. The Pet Poison Helpline, for example, reported a 448% increase in cases of marijuana poisoning between 2011 and 2017 (31). It has also been noted that while in the past most pets' marijuana exposure was due to plant material, pets are currently exposed to appealing edibles such as cookies and brownies, many of which contain chocolate, which can exacerbate negative effects (32).

Yet, even with limited data from clinical trials, pet owners are purchasing cannabis products for their pets, with anecdotal reports indicating that many owners find the products helpful in the treatment of their pets' pain, arthritis, seizures, and anxiety. A study summarized by the AVMA reported that pet owners are using cannabis to treat behavior-based disorders in addition to the management of pain, nausea, and seizures (33). Another recent study surveyed pet owners who had purchased hemp products from one company (34). They found that dog owners reported hemp products were helpful for many ailments, with the most common uses including: pain relief, sleep aid, and relief from anxiety. The most common uses cited by cat owners were pain relief, reduction of inflammation, and aid in sleeping. The most common side effects reported by both cat and dog owners were sedation and an over-active appetite. When asked to compare hemp products to other forms of medication or therapy, most dog and cat owners felt hemp products were more effective than other treatments. These results have been replicated in a follow-up study in the US surveying a national sample of dog owners' use and perceptions of CBD products for their pets (35).

This current study expands on previous studies conducted with US pet owners. The purpose of the current study was to survey Canadian dog owners about which cannabis products (e.g., capsules, liquid, chew) they are purchasing, reasons for their purchases, and the perceived value of these products on their dogs' health.

Materials and methods

An online survey was created in Qualtrics (Seattle, Washington, USA) to assess perceptions held by dog owners residing in Canada regarding hemp and marijuana products for their dogs. The survey was designed, reviewed, and tested by the co-investigators and their colleagues at Colorado State University (CSU), North Carolina State University (NCSU), and the Canadian Association of Veterinary Cannabinoid Medicine (CAVCM), who provided feedback on content, navigability, survey questions and choices, and overall questionnaire design. The survey originated from CSU and received approval from the Institutional Review Board at CSU. Participants were recruited *via* social media, from October 25, 2017 to February 1, 2018. All data were collected anonymously. The survey began by asking participants to indicate if they were dog owners and lived in Canada. Non-dog owners and those not residing in Canada were eliminated from analysis.

Respondents were first asked to indicate demographic factors including gender, educational level, age, and province in which they currently reside. They were then asked if they had ever purchased hemp or marijuana products for their dogs and if so, where they obtained the products. If they replied no, they were asked to select the reasons why they had not bought hemp or marijuana products for their dogs. For those who had purchased these products, they were then asked specific questions about types of hemp or marijuana products including capsules/pills, biscuits/edibles, and oil for topical use.

The next section of the survey asked respondents to identify the ailments for which they used hemp or marijuana products,

how they felt these products compared to prescription or conventional medication, and side effects. Next, they were asked to identify where they obtained information about hemp or marijuana products and categorize their comfort level discussing these products with their veterinarian. They were then asked if they had recommended hemp or marijuana products to their friends.

The last section of the survey asked the respondents' level of agreement with several statements regarding the decision to purchase hemp or marijuana products. Lastly, they were asked if they use hemp or marijuana products either medically or recreationally for themselves.

Survey responses were downloaded into SPSS (IBM, Armonk, New York, USA) for data analysis. The 120 responses were screened in order to exclude respondents who reported they did not own a dog or left dog ownership question unanswered ($n = 7$), did not live in Canada ($n = 6$), or did not answer the question ($n = 8$). This resulted in 106 respondents for analysis.

Descriptive statistics and frequency distribution were determined using commercial software. The totals for each question vary because not all questions were answered by all participants. The percentages reported for each question are based on total responses for that question. A Chi-squared test was used to test for differences in decision to obtain hemp or marijuana products for their dog based on respondents' gender, age, educational level, and personal use of hemp or marijuana products (medical or recreational). Differences were considered significant when $P < 0.05$.

Results

Owner demographics

A total of 120 responses were collected. Participants who did not currently own a dog or did not live in the US were eliminated, leaving a total of 106 participants for analyses. Of those who reported gender ($n = 104$), 90 (86.5%) indicated they were female, and 13 (12.5%) indicated they were male, 1 (1.0%) reported NA. When asked about age ($n = 104$), 2 (1.9%) reported being 18 to 25 y of age, 13 (12.5%) ages 26 to 30, 7 (6.7%) between 31 and 35, 11 (10.6%) between 36 and 40, 13 (12.5%) between 41 and 45, 11 (10.6%) between 46 and 50, 18 (17.3%) between 51 and 55, 15 (14.4%) between 56 and 60, and 14 (13.5%) older than 60 y.

When asked about education ($n = 104$), 13 (12.5%) reported some high school or diploma, 39 (37.5%) reported some college, 27 (26.0%) a 4-year degree, and 25 (24.0%) a graduate degree. When asked to report what province they live in ($n = 68$), the largest percentages were from Ontario (29, 42.6%), and British Columbia (28, 41.2%). When asked about personal use of hemp or marijuana products ($n = 106$), 42 (39.6%) reported using medical hemp or marijuana products and 10 (9.4%) reported using recreational hemp or marijuana products.

Use of hemp or marijuana products for dogs

When survey respondents were asked if they had ever bought hemp or marijuana products for their dog(s) ($n = 104$), 83 (79.8%) replied yes and 21 (20.2%) said no. Those who reported they have never purchased hemp or marijuana products

for their dogs gave the following reasons for this decision: they did not know where to get it ($n = 7$), their dog does not have any medical issues they feel could be helped with these products ($n = 5$), safety or toxicity concerns ($n = 5$), lack of standardization/regulation of products ($n = 5$), have not really thought about it ($n = 4$), lack of research about hemp or marijuana products ($n = 3$), legal concerns ($n = 2$).

A Chi-squared test was used to assess the potential correlation of age, gender, and education level with the decision to purchase hemp or marijuana products for their dogs. None of these demographic factors affected owners' decision to purchase these products for their dogs. Respondents were also asked if they personally use any hemp or marijuana products either medically or recreationally. Recreational or medical use of hemp or marijuana products was not correlated with the decision to purchase cannabis products for their dogs.

Participants who indicated they had bought hemp or marijuana products for their dog ($n = 83$), were asked to indicate how they acquired the products (they could select all that apply, so total equals more than 100%). The most common response was online (38, 45.8%), followed by local pet or animal supply store (14, 16.9%), stores selling hemp or marijuana for human consumption (33, 39.8%), friends/family (10, 12.0%), veterinarian (9, 10.8%), and use of a product previously purchased for personal use (12, 14.5%).

Questions about the type(s) of hemp or marijuana products used for their pets were asked next. Regarding capsules/pills ($n = 68$), 12 (17.6%) reported using those marketed for animals, whereas 3 (4.4%) reported using capsules/pills that were marketed for humans. This same trend was seen for biscuits/edibles, with more owners (34, 47.2%) reporting using biscuits/edibles marketed for animals compared to (2, 2.8%) using those marketed for humans. For topical oil, however, more people reported using products marketed for humans (10, 14.3%) compared to products marketed for animals (8, 11.4%).

The next set of questions asked participants to indicate what dog ailment(s) they were treating with the hemp or marijuana products (they could select all that apply, $n = 83$). The most common responses were pain relief, anxiety, and reduction of inflammation. Many people also selected "other" (39, 47.0%). The most common "other" responses included cancer (11, 13.3%) and epilepsy/seizures (8, 9.6%). For each listed medical condition, participants were then asked to compare perceived effectiveness of hemp or marijuana products with prescription or conventional medications prescribed by their veterinarian. For all medical conditions, hemp or marijuana products were viewed more favorably or equal to prescription or conventional medications (Tables 1, 2).

Participants were then asked to report their perceptions of side effects experienced by their dog. Side effects were reported by only a minority of dog owners, with the most common ones including sedation and dry mouth/excessive drinking (Table 3).

When participants were asked where they obtained information about hemp or marijuana products ($n = 83$, they could select all that apply), the most common responses included: information on an animal hemp or marijuana product company website (31, 37.3%), veterinarian (21, 25.3%), neighbor/friend/

Table 1. Ailment for which hemp or marijuana products were purchased, among participants ($n = 83$) who reported their use.

Health condition	Used hemp or marijuana products for this ailment ($n = 83$)
Provide pain relief	60 (72.3%)
Reduce inflammation	39 (47.0%)
Help relieve anxiety	33 (39.8%)
Help with thunderstorm or fireworks phobia	15 (18.1%)
Aid with sleep	15 (18.1%)
Reduce vomiting and nausea	6 (7.2%)
Seizures	0 (0%)
Help suppress muscle spasms	6 (7.2%)

Participants were able to select more than one ailment, thus the total is greater than 83.

relative (20, 24.1%), someone in animal care (e.g., groomer, pet store employee) (16, 19.3%), and information on company website marketing hemp or marijuana product for human use (17, 20.5%). Participants were asked if they had ever talked to their veterinarian about hemp or marijuana products ($n = 71$ respondents) and 52 (73.2%) said yes. They were also asked how comfortable they feel talking to their veterinarian about hemp or marijuana products ($n = 70$), and 42 (60.0%) said extremely comfortable, 10 (14.3%) said somewhat comfortable, 9 (12.9%) said neither comfortable nor uncomfortable, 5 (7.1%) said somewhat uncomfortable, and 4 (5.7%) said extremely uncomfortable. When asked if they would recommend hemp or marijuana products to their friends to use with their own dog ($n = 70$), 65 (92.9%) said yes and 5 (7.1%) said no.

Next, respondents who purchased hemp or marijuana products were asked to indicate their level of agreement with several statements about these products. For example, most participants agreed that they purchased hemp or marijuana products because they prefer them to conventional medication or liked the idea they come from natural sources (Table 4). Lastly, participants were asked to rate their interest in further research on the potential benefits of hemp or marijuana products for animals ($n = 90$) and 77 (85.6%) reported high interest, 12 (13.3%) moderate interest, and 1 (1.1%) low/no interest.

Discussion

This is the first Canadian study to explore dog owners' use and perceptions of cannabis products for their dogs. Results of this study offer insights into dog owners' experiences, including perceived benefits and side effects of canine cannabis products as well as owner characteristics that might influence these decisions.

Most survey respondents (83, 79.8%) indicated that they have purchased cannabis products for their dogs. It is not suggested that this percentage can be generalized to the Canadian population. This high percentage is likely due to the social media postings and sharing of this survey on dog and pet cannabis Facebook pages. Although it is not suggested this sample is indicative of current usage rates of pet cannabis products among Canadian dog owners, there are valuable insights that can be garnered from the responses.

Table 2. Perceived efficacy of hemp or marijuana products for pet health conditions, as compared to conventional medications.

Health condition	Perceived comparison to conventional medications			
	More effective	Same	Less effective	Not a condition my dog has/NA
Provide pain relief (<i>n</i> = 68) ^a	45 (66.2%)	11 (16.2%)	4 (5.9%)	8 (11.8%)
Reduce inflammation (<i>n</i> = 65)	34 (52.3%)	12 (18.5%)	4 (6.2%)	15 (23.1%)
Help relieve anxiety (<i>n</i> = 65)	36 (55.4%)	8 (12.3%)	4 (6.2%)	17 (26.2%)
Help with thunderstorm or fireworks phobia (<i>n</i> = 64)	17 (26.6%)	4 (6.3%)	1 (1.6%)	42 (65.6%)
Aid with sleep (<i>n</i> = 58)	19 (32.8%)	8 (13.8%)	0 (0%)	31 (53.4%)
Reduce vomiting and nausea (<i>n</i> = 58)	9 (15.5%)	6 (10.3%)	1 (1.7%)	42 (72.4%)
Seizures (<i>n</i> = 61)	14 (23.0%)	2 (3.3%)	0 (0%)	45 (73.8%)
Help suppress muscle spasms (<i>n</i> = 60)	15 (25.0%)	2 (3.3%)	2 (3.3%)	41 (68.3%)

^a *n* values for comparison to conventional medication question.

NA — Not applicable.

Table 3. Side effects of hemp or marijuana products experienced by pet dogs, as reported by their owners.

Side effect	No side effects	Minimal side effects	Significant side effects	Don't know/NA
Sedation/tired (<i>n</i> = 62)	26 (41.9%)	28 (45.2%)	4 (6.5%)	4 (6.5%)
Lack of energy (<i>n</i> = 63)	50 (79.4%)	10 (15.9%)	1 (1.6%)	2 (3.2%)
Dry mouth/excessive drinking (<i>n</i> = 65)	45 (69.2%)	11 (16.9%)	2 (3.1%)	7 (10.8%)
Over active appetite (<i>n</i> = 68)	46 (67.6%)	15 (22.1%)	3 (4.4%)	4 (5.9%)
Impaired mental functioning (<i>n</i> = 62)	50 (80.6%)	9 (14.5%)	1 (1.6%)	2 (3.2%)
Dizziness (<i>n</i> = 62)	47 (75.8%)	6 (9.7%)	1 (1.6%)	8 (12.9%)
Panic reactions (<i>n</i> = 62)	53 (85.5%)	3 (4.8%)	2 (3.2%)	4 (6.5%)
Vomiting (<i>n</i> = 63)	55 (87.3%)	4 (6.3%)	1 (1.6%)	3 (4.8%)
Loss of appetite (<i>n</i> = 63)	59 (93.7%)	1 (1.6%)	0 (0%)	3 (4.8%)
Dry or red eyes (<i>n</i> = 62)	55 (88.7%)	2 (3.2%)	1 (1.6%)	4 (6.5%)

NA — Not applicable.

Table 4. Endorsement of reasons for purchasing hemp or marijuana products.

Reason for purchasing	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I thought it would work well as an adjunct to other therapies (<i>n</i> = 67)	52 (77.6%)	11 (16.4%)	3 (4.5%)	1 (1.5%)	0 (0%)
I like the idea that this product comes from natural sources (<i>n</i> = 67)	40 (59.7%)	16 (23.9%)	8 (11.9%)	0 (0%)	3 (4.5%)
I prefer hemp products to conventional medicine (<i>n</i> = 70)	40 (57.1%)	15 (21.4%)	8 (11.4%)	2 (2.9%)	5 (7.1%)
I don't like to support major pharmaceutical companies (<i>n</i> = 69)	18 (26.1%)	17 (24.6%)	21 (30.4%)	3 (4.3%)	10 (14.5%)
The cost of the product was right for me (<i>n</i> = 67)	13 (19.4%)	16 (23.9%)	22 (32.8%)	8 (11.9%)	8 (11.9%)

These results suggest that biscuits/edibles marketed specifically for dogs are the most common form of cannabis products currently purchased for dogs, distantly followed by capsules/pills. Few owners report administering products made for human consumption. Given the potential risk of giving dogs cannabis products produced for human consumption, it is encouraging to note that only a small percentage of respondents reported giving their dogs CBD products marketed for human use. This suggests that at least some dog owners appear to understand that human consumption products and animal use products are not easily interchangeable.

As reported by Kogan et al (34), the most common use of canine cannabis products was for pain relief (72.3%). This was followed by reduction of inflammation (47.0%) and relief from anxiety (39.8%). Interestingly, participants in this study reported using CBD as a sleep aid less frequently than those in the 2016 study by Kogan et al (18.1% versus 50.5%) (35). Yet, like the previous study, participants reported feeling that canna-

bis products were either equivalent or better when compared to conventional prescription medications for all listed conditions. Significant side effects were observed by less than 5% of owners, with most participants reporting no side effects. The exception was sedation; 6.5% of participants observed this as a significant side effect. Given reports of effectiveness and limited side effects, it is not surprising that 92.9% of participants reported they would recommend hemp or marijuana products to friends for use with their own dogs.

To better understand why dog owners are purchasing canine CBD products, respondents were asked a series of questions related to their beliefs about cannabis products. From their responses, it appears the most common reasons for purchasing cannabis products include the positive perception of these products as an adjunct to other therapies; because they like the idea that the product comes from natural sources; and because they prefer these products over conventional medicine. Less common responses included the fact that they do not like to support

major pharmaceutical companies or because of the price. It is noteworthy that 77.6% of respondents strongly agree that hemp or marijuana products can work well as adjunct therapies. This would appear to suggest that while the market for these products continues to expand, it might not come at the cost of other medical interventions.

For participants who responded that they have not obtained cannabis products for their dogs, the most common reasons given for this decision included: that they did not know how to acquire it, the fact that they were not currently needed, safety or toxicity concerns, and a lack of standardization/regulation of products. These results suggest that with additional education on its potential benefits, as well as changes in legal and logistical factors associated with obtaining it, many current non-users might be willing to try cannabis products for their dogs.

Given the constantly changing laws and regulations on cannabis products, and the lack of scientific study, obtaining accurate information on cannabis products is critically important. The sources most often identified for information are animal hemp or marijuana product company websites (37.3%) followed by veterinarians (25.3%) and neighbor/friend/relative (24.1%). The fact that veterinarians are not the most common source for cannabis-related information is noteworthy. It appears this is not due to owners' discomfort talking about the subject; most of these dog owners (74.3%) reported feeling comfortable talking to their veterinarian about hemp or marijuana products. Understandably, the changing laws and lack of research make it challenging for veterinarians to share their knowledge and perceptions related to cannabis products, yet it is imperative for veterinarians to provide this resource. Pet owners want cannabis information and the fact that they are most commonly finding answers on cannabis company websites, which may or may not be factual and unbiased, is concerning.

There are several limitations to the current study. First, these results should not be interpreted as endorsement of the efficacy of cannabis products for treatment of any disease in animals. Limitations of this study are the small sample size and possible selection bias, the lack of a control group, the absence of a means of verification of owners' ability to accurately and objectively assess changes in the medical condition of their pet, and the anecdotal nature of the responses to the questions. Nevertheless, the survey clearly demonstrates that CBD products are viewed favorably by pet owners, underscoring the need for veterinarians to be informed about these options and the need for additional scientific studies and clinical trials.

Although the potential of a placebo effect cannot be ignored (36), the results of the present study indicate that a large number of pet owners feel hemp products help their pets with numerous ailments and incur minimal side effects. These results provide support for the growing number of anecdotal stories and give some guidance to researchers interested in putative effectiveness and possible side effects of hemp or marijuana. We have identified the positive outcomes most commonly reported by consumers. The next step to determine the clinical value of cannabis use is through additional controlled clinical trials, to expand the results of Gamble et al (5). Furthermore, studies that include independent laboratory analysis of product con-

tents, including concentration of active ingredients; impact of non-active ingredients and additives; stability in the products administered; batch-to-batch variability; and potential contamination with pesticides, fungicides, and herbicides, are necessary. The field of veterinary medicine is ideally poised to lead these efforts.

Due to the current lack of evidence-based research and conflicting legislation surrounding the use of cannabis products in veterinary populations, it is challenging for veterinarians to provide explicit client recommendations in this arena. The results of this study show that pet owners are frequently considering cannabis products for use in treating pain, inflammation, and other conditions in their dogs. It is incumbent upon veterinarians, therefore, to advocate for scientific research to be conducted regarding this use.

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