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Original Research

The role of the community pharmacist in veterinary patient care: a cross-sectional study of pharmacist and veterinarian viewpoints

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Abstract

Background: The role of the community pharmacist is rapidly expanding to encompass the care of veterinary patients in the United States of America. This change makes it imperative for pharmacists and veterinarians who practice in community settings to establish mutual agreement on the roles of pharmacists in the care of these patients.

Objective: To examine community-based pharmacist and veterinarian viewpoints on interprofessional collaboration and the role of the community pharmacist in veterinary patient care.

Methods: Cross-sectional surveys were sent to pharmacists and veterinarians who practice in a community setting in Ohio. Surveys collected demographic information and addressed the following themes: attitudes toward collaboration, perceived roles of the pharmacist, expectations of the pharmacist, and previous collaborative experiences. A chi-square test was used for statistical analysis.

Results: In total, 357 pharmacists and 232 veterinarians participated in the study. Both professions agreed that pharmacist-veterinarian collaboration is important in order to optimize veterinary patient care (chi-square (1, N=589)=7.7, p=0.006). Overall, veterinarians were more likely to identify an important role of the community pharmacist to be compounding medications (chi-square (1, N=589)=26.7, p<0.001) compared to counseling pet owners (chi-square (1, N=589)=171.7, p<0.001). Both groups reported similar levels of agreement regarding the importance for pharmacists to have adequate knowledge of veterinary medicine.

Conclusions: Our study found that while both pharmacists and veterinarians conveyed a positive attitude regarding interprofessional collaboration, they disagreed on what role the pharmacist should play in the care of veterinary patients. Rectifying the discordant perceptions of these health care professionals may be critical to developing collaborative initiatives and optimizing veterinary patient care.

Keywords

Pharmacists; Veterinarians; Professional Role; Intersectoral Collaboration; Pharmacies; Counseling; Drug Compounding; Surveys and Questionnaires; United States

INTRODUCTION

The role of the community pharmacist is rapidly expanding to include the care of veterinary patients in the United States of America (USA).¹ Traditionally, veterinarians were the sole distributors of companion animal medications, otherwise known as pet medications.² Following the implementation of The American Veterinary Medical Association's (AVMA) Principles of Medical Ethics, veterinarians are now required to provide prescriptions to pet owners ("clients") upon request, as long as a veterinarian-patient relationship exists.³ With the freedom to fill prescriptions elsewhere, many clients have chosen to utilize community pharmacies.² As a result, a growing number of community pharmacists throughout the country are dispensing prescriptions for common pets such as dogs, cats, and ferrets and interacting more frequently with clients.² There is not a clear delineation of the percentage of

prescriptions filled by community pharmacies compared to veterinary clinics in Ohio. However, it is evident that with the increased demand of medications for companion animals, there is an equal demand for the convenience and competitive pricing of prescriptions obtained at community pharmacies, especially given that a low percentage of clients have pet insurance.^{2,4,5}

This change presents both challenges and opportunities and makes it imperative for pharmacists and veterinarians to establish an understanding of and mutual agreement on the roles of pharmacists involved in the care of veterinary patients. Within the practice of human medicine, pharmacists have proven themselves crucial members of the health care team through their integral work and collaboration with other health care providers. Specifically in community settings, pharmacists frequently collaborate with physicians and other providers in order to select appropriate medication therapies, assist with managing chronic conditions, and ensure the safe dispensing of prescriptions for their patients. Pharmacists would be well-suited to engage in similar interactions with veterinarians to further improve patient care. However, numerous limitations, specifically regarding the education pharmacists receive in veterinary pharmacy and veterinary medicine in general, may inhibit optimal collaboration.

A lack of sufficient education in veterinary pharmacy has the potential to greatly influence community pharmacists'

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perceptions concerning their role in the care of veterinary patients. The current Accreditation Council for Pharmacy Education (ACPE) standards do not include a mandate that veterinary pharmacotherapy be included within pharmacy school curricula, and pharmacy programs nationwide lack standardized educational instruction in this area.^{6,7} For practicing pharmacists, veterinary pharmacy training is generally limited and may not be prioritized; nine out of ten pharmacists reported no previous training in veterinary pharmacy.⁸ Lack of adequate training is a common issue in both the USA and abroad, and insufficient educational experiences could hinder pharmacists from safely dispensing veterinary medications or appropriately counseling clients.^{9,10} Additionally, community pharmacists may be unaware of roles in which they are legally prohibited from engaging. Pharmacists have not only reported inadequate knowledge of veterinary pharmacotherapy but also of legal aspects pertinent to compounding for veterinary patients.⁸ For example, pharmacists may be unaware they cannot legally recommend over-the-counter (OTC) medications for veterinary patients without the recommendation or a prescription from a veterinarian. Without a clear understanding of their roles, community pharmacists may endanger pet health and place themselves in legal jeopardy.

A related concern is that community pharmacists may have little to no experience interacting with veterinarians upon graduating pharmacy school. ACPE Standard 11 focuses specifically on interprofessional education, with requirements for students to demonstrate competences in interprofessional team dynamics, advancing the quality of patient care, and engage in shared therapeutic decision-making.⁷ While pharmacy students often interact with other health care providers in order to hone these skills, these interactions are less likely to involve veterinarians or veterinary students given the dearth of veterinary pharmacy-related education. Consequently, pharmacists may be unsure how to successfully navigate interprofessional relationships with these providers and unaware of specific situations in which referring to or consulting a veterinarian is vital to the care of their patients. Further, pharmacists may request unnecessary information from veterinarians, such as National Provider Identifier (NPI) numbers, or ask common dosage questions that could be referenced elsewhere. These types of interactions could lead to the development of tension within interprofessional relationships. While some veterinary programs are inclusive of an interprofessional education component that incorporates pharmacy students, this alone may be insufficient to ensure a full understanding of the roles community pharmacists can play within veterinary medicine.¹¹ Ultimately, the potential exists for misunderstandings regarding the role of the pharmacist to occur, which can lead to an environment lacking clear communication or trust.

In a survey of members of the AMVA, pharmacists were ranked among the top health care professionals with whom veterinarians interacted with most frequently.¹² Despite this finding, working relationships between pharmacists and veterinarians have not been established or further developed to the same extent as those with other

healthcare providers.¹ Limited data exist regarding pharmacist and veterinarian viewpoints on collaboration and the role of the pharmacist pertinent to veterinary patient care in the community setting. A thorough evaluation of the current working relationship between these professionals could potentially lead to the development of educational and collaborative initiatives and the formation of strong, interprofessional partnerships.

The objective of this study is to examine community-based pharmacist and veterinarian viewpoints on interprofessional collaboration and the role of the community pharmacist in veterinary patient care.

METHODS

Survey design

A literature search was performed in order to determine the extent of available research on the current working relationship between community pharmacists and veterinarians. A search was also performed to assist with the development of survey structure as well as pertinent survey questions.¹³ Two electronic, cross-sectional surveys were created: one for pharmacists and one for veterinarians. Each survey collected respondent demographic information. Specifically for the categories of “sex” and “age”, respondents had to the option to select “choose not to answer”. At the beginning of the survey, respondents were asked whether or not they work in a community practice setting. If they selected “no” the survey ended. The remainder of the survey was organized into four domains. Two of the survey domains, attitudes toward collaboration and expectations of the pharmacist, were comprised of statements that were ranked using a 4-point Likert scale inclusive of strongly agree, agree, disagree, and strongly disagree. For a third domain, perceived roles of the pharmacist, respondents were asked to select any of the listed tasks they felt were important roles of the pharmacist with regard to the care of veterinary patients. For the final domain, previous collaborative experiences, respondents were asked to select the frequency with which they engaged in various collaborative interactions. The terms ‘pets’ and ‘animal patients’ were used interchangeably within the survey questions. An open response section was also included, in which respondents could detail any additional thoughts or experiences regarding these themes. Both surveys were piloted, and questions were reviewed for content and structure. Feedback was utilized to make adjustments and clarifications in order to improve the validity of the study. This study was approved by the Northeast Ohio Medical University Institutional Review Board.

Survey distribution

Lists of all pharmacists and veterinarians licensed in the state of Ohio were obtained with permission from the Ohio State Board of Pharmacy (OSBP) and Ohio Veterinary Medical Licensing Board (OVMLB), respectively. Recorded individuals were invited to participate in the study. Participants were sent an email with detailed information regarding the study and a hyperlink to the survey questions. Survey instructions specified that only pharmacists and veterinarians practicing in a community

Table 1. Respondent characteristics		
Characteristic; n (%)	Pharmacists n=357	Veterinarians n=232
Gender		
Male	111 (31)	56 (24)
Female	241 (68)	174 (75)
Choose not to answer	5 (1)	2 (1)
Age (years)		
<25	11 (3)	0 (0)
26-35	118 (33)	84 (36)
36-45	58 (16)	65 (28)
46-55	74 (21)	31 (13)
>55	90 (25)	51 (22)
Choose not to answer	6 (2)	1 (1)
Years since graduation		
<5	79 (22)	44 (19)
5-10	68 (19)	57 (25)
11-20	41 (12)	56 (24)
>20	169 (47)	75 (32)
Number of years in practice		
<5	82 (23)	44 (19)
5-10	66 (18)	58 (25)
11-20	42 (12)	57 (25)
>20	167 (47)	73 (31)

setting should complete the survey. Participants consented to participate in the study by clicking a confirmation link. No identifying information was collected, and all responses were anonymous. Surveys were distributed to potential participants via email on August 7, 2019. A reminder email was sent out every week for three weeks, and the survey closed on September 3, 2019.

Data analysis

Only data for surveys that were fully completed were included in the final analysis. The responses to survey components utilizing the 4-point Likert scale were consolidated into two categories of agree (strongly agree and agree) and disagree (strongly disagree and disagree) and percentages of agreement were reported for each statement. Data related to the perceived roles of the pharmacist section were reported as percentages of pharmacists and veterinarians who selected each option, and responses to the previous collaborative experiences section were also reported as percentages. Responses were compared between the groups using chi-square with alpha set at 0.05. SPSS (version 26.0, SPSS, Inc.) was used to analyze data. Submissions within the open response section were qualitatively assessed for emerging themes.

RESULTS

Surveys were sent to all licensed pharmacists and veterinarians in Ohio and were only intended to be completed by individuals practicing in a community setting. Thus, the response rate for this study cannot be determined, and estimated response rates are reported. In order to achieve adequate power, 372 pharmacists and 347

Table 2. Attitudes toward collaboration		
	Pharmacists	Veterinarians
I am interested in collaborating with local pharmacists/veterinarians*	92%	84%
Collaboration between pharmacists and veterinarians improves patient outcomes*	95%	90%
Collaboration between pharmacists and veterinarians is important in order to provide optimal patient care*	95%	89%

*Statistical significance noted (p<0.05)

veterinarians needed to complete the surveys. Of the 19,372 pharmacists invited to participate in the study, 579 began the survey and 357 completed it. Approximately 60% of pharmacists practice in a community setting in the USA, yielding an estimated 3% response rate.¹⁴ Of the 4,196 veterinarians invited to participate in the study, 253 began the survey and 232 completed it, approximately, 85% of veterinarians in Ohio practice in a community setting, yielding an estimated 7% response rate.

Pharmacist and veterinarian respondents differed significantly with regard to age, number of years since graduation, and number of years in practice. The two groups were similar with regard to gender, with the majority of respondents being female. Sixty-eight percent of pharmacist respondents practice in a chain pharmacy setting and 25% practice in an independent pharmacy setting. Half of all pharmacist respondents have a Doctor of Pharmacy degree. Of the veterinarian respondents, 75% work in a private practice setting and 17% work in a corporate practice setting. The remainder practice in some other community setting, including shelters and nonprofit clinics. All veterinarian respondents have a degree in veterinary medicine. Respondent characteristics are reported in Table 1.

While the majority of pharmacist and veterinarian respondents expressed a positive attitude toward interprofessional collaboration, a significant difference was noted for responses to all three statements related to attitudes toward collaboration (Table 2). A significantly lower percentage of veterinarians felt that collaboration between pharmacists and veterinarians is important to optimize patient care and improve patient outcomes (chi-square (1, N=589)=7.7, p=0.006 and chi-square (3, N=589)=6.8, p=0.009, respectively). Similarly, veterinarians were significantly less likely to have an interest in collaborating with local pharmacists (chi-square (1, N=589)=9.3, p=0.002).

Survey respondents were asked to select any tasks they perceive as important roles of the community pharmacist with regard to the care of veterinary patients (Table 3). While the majority of pharmacists and veterinarians agreed that dispensing prescriptions for veterinary patients is an

Table 3. Perceived roles of the pharmacist		
	Pharmacists	Veterinarians
Having a strong, working knowledge of veterinary medications	64%	71%
Referring pet owners to local veterinarians when appropriate	74%	67%
Counseling pet owners (clients)*	77%	22%
Compounding medications for animal patients*	62%	82%
Dispensing prescriptions for animal patients*	97%	87%

* Statistical significance noted (p<0.05)



Table 4. Expectations of the pharmacist

	Pharmacists	Veterinarians
It is important that pharmacists are aware of legal and regulatory issues related to pet prescriptions	96%	97%
It is important that pharmacists contact veterinarians with issues regarding pet prescriptions	99%	99%
It is important that pharmacists are aware of toxicities of over-the-counter medication use in animal patients	89%	91%
It is important that pharmacists have adequate veterinary medicine knowledge	85%	83%
Pharmacists do not have a role in veterinary medicine	14%	9%

important role of the pharmacist, a significant difference was noted, with a lower percentage of veterinarians identifying this as an important role (chi-square (1, N=589)=21.1, $p<0.001$). A significant difference was also found with regard to counseling clients, as approximately 75% of pharmacists selected this as an important role of the pharmacist, while only 22% of veterinarians felt similarly (chi-square (1, N=589)=171.7, $p<0.001$). Also of note, a significant difference was seen with regard to the role of compounding medications for veterinary patients, with approximately 80% of veterinarians classifying this task as an important role, while only 60% of pharmacists perceived it likewise (chi-square (1, N=589)=26.7, $p<0.001$).

Survey respondents were asked to rate their level of agreement for five statements related to expectations of the pharmacist with regard to the care of veterinary patients. Agreement was noted for both groups regarding the expectations that pharmacists have adequate veterinary medicine knowledge (chi-square (1, N=589)=0.350, $p=0.56$) and are aware of toxicities of OTC medications used in animal patients (chi-square (1, N=589)=1.026, $p=0.31$). No significant differences were noted between the groups for any of the statements (Table 4).

Significant differences were noted between pharmacist and veterinarian respondents with respect to all four scenarios encompassing previous collaborative experiences (Table 5).

Two main themes emerged from the open response section: a desire for improved pharmacist knowledge of veterinary medicine, and the need for better collaboration between practicing community pharmacists and

veterinarians. Out of 107 veterinarian respondents who submitted an open response, 50% expressed concern regarding pharmacists' inadequate knowledge pertaining to veterinary medicine. Additionally, 20% of veterinarian respondents specifically mentioned the need for stronger collaboration with local pharmacists in order to improve patient care. Fifty-two pharmacist respondents submitted an open response. Of those, 50% noted concern with the lack of training they received in veterinary patient care, and 25% specifically mentioned wanting additional training in this area.

DISCUSSION

As clients continue to rely more heavily on community pharmacies to fill prescriptions for companion animals, there is a growing need to establish more cooperative relationships between pharmacists and veterinarians in order to better serve the needs of their mutual patients.^{1,2} Our study found contact between pharmacists and veterinarians is generally limited, suggesting working relationships are either in progress or not in place. Promisingly, findings highlighted the mutual agreement that collaboration is necessary in order to optimize the care of veterinary patients and revealed a strong interest in collaboration from both pharmacist and veterinarian respondents. With this concurrence, initiatives to enhance collaboration can be piloted, and future studies may assess the effects of such strategies.

Results also revealed differences between pharmacists and veterinarians with regard to the perceived roles of the

Table 5. Previous collaborative experiences

Frequency	Veterinarians n (%)	Pharmacists n (%)	Chi square test of independence
A pharmacist contacts you regarding an animal patient/A veterinarian contacts you regarding an animal patient			
Daily	5 (2)	51 (14)	64.9, $p<0.001$ (3, N=589)
Weekly	37 (16)	123 (34)	
Monthly	111 (48)	126 (36)	
Never	79 (34)	57 (16)	
You ask a pharmacist to compound a medication for an animal patient/A veterinarian requests you compound a medication for an animal patient			
Daily	15 (60)	22 (6)	222.6, $p<0.001$ (3, N=589)
Weekly	83 (36)	9 (3)	
Monthly	99 (43)	66 (18)	
Never	35 (15)	260 (73)	
You ask a pharmacist to counsel a pet owner regarding an animal patient/A veterinarian asks you to counsel a pet owner regarding an animal patient			
Daily	1 (0.5)	17 (5)	55.6, $p<0.001$ (3, N=589)
Weekly	2 (1)	21 (6)	
Monthly	9 (4)	71 (20)	
Never	220 (95.5)	248 (69)	
A pharmacist refers a pet owner to you/You refer a pet owner to a veterinarian			
Daily	1 (0.5)	4 (1)	138.2, $p<0.001$ (3, N=589)
Weekly	3 (1)	45 (13)	
Monthly	13 (6)	147 (41)	
Never	215 (92.5)	161 (45)	

community pharmacist involved in the care of veterinary patients. Notably, a relatively low percentage of pharmacist respondents perceive their role as inclusive of compounding for veterinary patients. Even though nonsterile compounding is a common component of pharmacy student training, the translation of these skills for use in veterinary patients may not be made apparent within pharmacy school curricula. Given that a large percentage of veterinarian respondents perceive this as an important role of the pharmacist, this may be an area in which pharmacists can demonstrate a more unique skill set and begin to develop better relationships with local veterinarians through the provision of compounding services. Findings in the literature are encouraging: a recent study found veterinarians and clients agree that pets and clients would benefit from community pharmacies providing compounding services and that pharmacists may be able to fill a need for veterinarians by providing these services.¹⁵

Given the lack of focus on veterinary medicine within pharmacy programs, it is reasonable that pharmacists have not established agreement on their roles pertaining to veterinary patient care. While The National Association of Boards of Pharmacy (NABP) has encouraged the incorporation of veterinary pharmacotherapy within pharmacy school curricula, other organizations such as ACPE have not made this a priority.^{7,16} In the state of Ohio, the pharmacy board describes rules and regulations pertinent to veterinarian prescribing but has yet to place mandates on pharmacist education with regard to dispensing prescriptions for veterinary patients. A lack of uniform recommendations from these organizations creates a potential barrier to not only furthering education within this area but also to encouraging pharmacists to take ownership of these roles. A stronger stance by national and statewide pharmacy organizations may not only help to improve pharmacists' knowledge and abilities but encourage those who work in community settings to put these skills into practice.

There was also noted disagreement regarding counseling clients as an important role of the pharmacist. Our study found pharmacists view counseling clients as an important role, and in the state of Ohio, pharmacists are legally required to offer counseling before dispensing any new or refilled prescription.¹⁷ While pharmacists are extensively trained in counseling within human medicine and this is considered a strength of the community pharmacist, a lack of knowledge and resources may lead to provision of inappropriate or illegal counseling of clients. For example, pharmacists may inadvertently provide dosing information on OTC medications without direct orders from a veterinarian. This further highlights the need for increased training not only in veterinary pharmacotherapy but also of associated legal aspects related to counseling clients for veterinary patients. The majority of veterinarian respondents do not perceive the pharmacist's role as inclusive of counseling clients. This may be due to a lack of confidence in the pharmacist's ability and knowledge to effectively counsel on these medications in multiple, non-human species. These concerns were substantiated by a 2012 survey conducted by the Oregon Veterinary Medical Association, which documented numerous instances of

pharmacists inappropriately counseling on veterinary prescriptions.¹⁸ Veterinarian concerns may be rectified through increased pharmacist training in veterinary pharmacy, and veterinarians may encourage this by promoting the advancement of pharmacist education in this area. While more widespread training programs are needed, current opportunities for pharmacists include online continuing education courses and certificate programs such as one offered through the University of Georgia.¹⁹ Pharmacists are able to receive training in veterinary compounding by participating in programs like the Veterinary Compounding Course offered by the Professional Compounding Centers of America.²⁰ Additionally, pharmacists may choose to join and support professional organizations such as the American College of Veterinary Pharmacists or the Society of Veterinary Hospital Pharmacists in order to participate in additional educational activities. Student pharmacists can consider shadowing veterinary pharmacists, participating in veterinary-focused elective courses or rotation experiences if available, and completing a veterinary pharmacy residency or fellowship.

Finally, our survey reviewed the previous collaborative experiences between veterinarians and pharmacists. The frequencies of the detailed scenarios parallel responses within other sections of the survey. For example, the majority of veterinarians reported they never ask a pharmacist to counsel a pet owner regarding an animal patient. When asked about frequency of requests for compounding, veterinarians reported requesting compounded preparations from pharmacists most frequently on a weekly or monthly basis, but most pharmacist respondents reported they are never asked to compound medications for veterinary patients. This difference could be because only a small number of pharmacies, such as specialty pharmacies, are providing compounding services for numerous veterinarians. Compounded medications for veterinary patients may also be requested from mail order pharmacies, and the structure of our survey did not specifically address this demographic.

Limitations

The authors acknowledge limitations of this research dataset. First, statistical power was not achieved. Despite the use of an incentive to complete the survey, response rates did not reach target levels, though the response rate of pharmacists was close to ideal. Literature has shown physicians have low survey response rates, and while not specifically studied, this trend may translate to veterinarians as well.²¹ Due to less-than-ideal response rates, there is the potential for non-responder bias. However, some characteristics of our survey respondents are similar to those of the populations from which they were drawn. Per data obtained from the OSBP and the Ohio Veterinary Medical Association, respectively, 58% of licensed pharmacists and 60% of licensed veterinarians in Ohio are female.²² These rates are slightly lower than the female respondent rates of our survey. Additionally, the categorization of veterinarian respondents by year since graduation for our sample closely matches that of the practicing veterinarian population in Ohio.

The population studied only included those pharmacists and veterinarians licensed to practice in the state of Ohio, which could also limit the generalizability of our findings. Future studies may attempt to gather data from a wider selection of pharmacists and veterinarians who practice in community settings. Finally, our survey was not piloted by community-based veterinarians, which may have led to misinterpretation of survey components. Notably, there were no comments suggesting confusion about survey questions or structure within the open response section.

CONCLUSIONS

While both pharmacists and veterinarians expressed a positive attitude regarding interprofessional collaboration, they disagreed on what role the pharmacist should play in the care of veterinary patients. Rectifying the discordant perceptions of these health care professionals may be

critical to maximizing veterinary patient care. Educational and interprofessional endeavors should be identified to help clarify roles and develop a synergistic relationship between pharmacists and veterinarians in community practice. Future studies could also examine barriers to effective collaboration and preferred methods of communication between these health care providers.

CONFLICT OF INTEREST

The authors declare no relevant conflicts of interest or financial relationships.

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