



Research article

Pharmacist and veterinarian collaboration in Klang Valley, Malaysia: A veterinarians' perception

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ABSTRACT

Background: The collaboration between pharmacists and veterinarians plays a crucial role in ensuring optimal animal healthcare. Understanding the willingness of veterinarians to collaborate with pharmacists and analyzing the prescribing trends by veterinarians are essential factors in improving the quality of veterinary care. By analyzing these aspects, valuable insights can be gained to enhance interprofessional collaboration and optimize medication management in veterinary practice.

Objectives: To examine the willingness of veterinarians towards interprofessional collaboration with community pharmacist.

Methods: A cross-sectional study was conducted among 40 veterinary clinics in Klang Valley, Malaysia. Data was collected via online using Google Forms from registered veterinarians working in private veterinary clinics in Klang Valley, Malaysia. Descriptive statistics and statistical analysis were performed using SPSS version 27.

Results: The overall willingness of veterinarians to collaborate with community pharmacists was measured with a median score of 51 out of 75. The results indicated that 55 % of veterinarians demonstrated high willingness to collaborate. Specifically, 52.5 % of veterinarians had a positive attitude towards collaboration, 55 % recognized the roles of pharmacists positively, and 57.5 % identified barriers to collaboration. These findings highlight a generally positive inclination towards interprofessional collaboration among veterinarians.

Conclusion: More veterinarians demonstrated a positive willingness to collaborate with pharmacists for optimal patient care. However, several constraints were identified, including a lack of face-to-face communication, concerns about pharmacists' knowledge or skills in veterinary medicine, and financial interests. Addressing these issues could further enhance collaboration between veterinarians and pharmacist.

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1. Introduction

Pharmacists are recognized as medical professionals who can be most frequently encountered in the hospital or community healthcare settings [1]. Community pharmacists are frequently sought out first because they are viewed by the general public as the most accessible healthcare providers. In the community settings, pharmacists mainly offer patient oriented pharmaceutical care services, including treating minor illnesses, dispensing medications, providing counselling, recommending health supplements, conducting patient medication reviews, and offering weight management and smoking cessation programs [2].

However, pharmacists are typically disregarded when it comes to companion animals' prescriptions or their minor ailments. Historically, veterinarians' responsibilities are to diagnose health problems and diseases that are adversely affecting the animals' health and subsequently prescribing for the disease to restore optimum health for their furry patients [3]. In many countries, particularly in large animal medicine, economic considerations and resource constraints often influence how veterinary services are provided. This situation may contribute to the perception that veterinary prescriptions for minor ailments are sometimes overlooked or managed differently compared to companion animals [4].

According to Malaysian Poison Act 1952, registered pharmacists are the only health professionals that are legally allowed to dispense medication for the purpose of the medical, dental or animal treatment, of a particular individual. This means that Malaysian pharmacists are legally allowed to dispense for both species, humans and including animals too. This legal framework recognizes the role of pharmacists in supporting veterinary care, yet the integration of pharmacists into routine veterinary practice remains underutilized. Moreover, National regulations such as Veterinary Surgeons Act 1974 and National Animal Welfare Policy collectively ensure that veterinarians in Malaysia are properly credentialed, adhere to ethical standards, and provide quality care to animals. They also delineate the responsibilities of veterinarians in diagnosing and treating animal health conditions, which complements the role of pharmacists in the veterinary context.

Statista Research Department [5] recently published a poll on pet ownership in Malaysia which resulted in 53 % of respondents indicating that they own pets meanwhile 36 % said they do not own one. In the same survey, it also illustrated that 60 % of Malaysians own cats as pets, whilst 36 % of Malaysians own dogs as pets. This survey demonstrates unequivocally that having cats as pets is a more prevalent trend in this nation. With the growing trend of pet humanization, pet owners are more willing to invest in their pets' wellbeing and ensuring they receive the greatest care possible. Veterinary products are described by the World Organization for Animal Health as tools for preventing and controlling animal diseases. Vaccines, veterinary medications, and diagnostic kits are some of these products. In Malaysia, there are more than 700 veterinary products registered. These include vaccines, anthelmintics, antibiotics, antifungals, and multivitamins, among many other things. Most of these veterinary products are regulated by the National Pharmaceutical Regulatory Agency [6].

When it comes to treating veterinary patients, it can be difficult. This is because different species, breeds, sizes, ages and weight can affect the responses of the patient to the drug therapy. Hence, selection of medication and their dose must be precise. Veterinary patients cannot be simply treated as small humans as using a medicine intended for human use in pets without knowing the right dose as it might cause underdose or toxicity due to the difference in pharmacokinetics and pharmacodynamics in animals. When dispensing for animal patients, pharmacists are obligated to familiarize themselves with important species differences in regards with pharmacotherapy and susceptibility to adverse drug reactions [7].

Thus, pharmacists are required to expand their knowledge of veterinary pharmacy by researching commonly prescribed veterinary medicines for companion animals and exploring related veterinary medicine [8]. However, there is no such prescribing trends identified among the veterinarians in Malaysia to aid pharmacists who wish to pursue in expanding their knowledge in veterinary medicine.

Pharmacist-veterinarian interactions, in comparison to pharmacist-physician interactions, have received relatively less attention than the latter. To date, there is limited data published regarding the veterinarians' viewpoints toward the interprofessional collaboration with community pharmacists. If there is a thorough evaluation of the current working relationship between these two professional bodies, it could potentially lead to the formation of strong interprofessional collaboration, educational collaborative initiatives and the establishment of a novel career pathway for future pharmacists. Hence, this study aims to examine the willingness of veterinarians towards interprofessional collaboration with pharmacists.

2. Methodology

2.1. Study design and population

This was a cross sectional study using an online self-administered questionnaire via Google Forms. The target population of this study was veterinarians working in private veterinary clinics on a full-time basis in Klang Valley.

2.2. Inclusion and Exclusion criteria

Registered veterinarians with a minimum of 6 months of working experience, employed in a registered veterinary clinic, and possessing proficiency in English, were allowed to proceed with the questionnaire.

2.3. Sample size calculation

Given the absence of comparable or prior studies in Malaysia, the population size for this research was determined by acquiring a list of veterinary clinics in the Klang Valley region. This information was sourced from the Malaysia Small Animal Veterinary Association (MSAVA) which was a reliable professional association in the field of veterinary medicine. By utilizing this reputable source, we aimed to ensure a comprehensive and up-to-date compilation of veterinary clinics in the study area. There were estimated 40 available clinics in Klang Valley. The sample size was determined by Raosoft® by assuming a minimum of 1 certified veterinarian working in one clinic, thus, the study population size should be estimated at 40. The calculated sample size for this study was 37 with a 95 % confidence level, 5 % margin of errors, a study population size of 40 and assuming that the response distribution is 50 %.

2.4. Data collection procedure

The data were collected anonymously via a self-administered survey. The veterinary clinics around Klang Valley were approached physically to invite the veterinarian to participate in the study. The invited veterinarians were provided with a brief explanation of the aim and objective of this study and were assured of the confidentiality of the study. Those who agreed to participate were given the questionnaire by QR code generated from the google form. A reminder email or follow up call were done once weekly when no answer was received from the veterinarian. The participating veterinarians were ensured an ample amount of time to respond to the survey questions, taking into consideration their busy working schedules. They were specifically requested to provide their responses during dedicated time slots that were separate from their regular working hours. This approach aimed to minimize any potential influence of time constraints or distractions on their answers, ensuring that they could provide thoughtful and accurate responses.

2.5. Study questionnaire

The survey instrument used in this study was developed following a literature review based on previous published papers [9,10]. The survey questions were reviewed by 2 academicians from Taylors' University and one veterinarian, for appropriateness of content and structure. Feedback given was utilized to make modifications accordingly to improve the validity of the survey. The survey consisted of 5 sections: Section A, B, C, D and E which collects the details of demographic data, previous experience with collaborative practice, attitude towards collaborating with community pharmacists, perceived roles of pharmacists in veterinary care and perceived barriers for collaborative practice respectively. Data for section C to E were collected using a 5-point Likert scale. The scale ranged from [1] representing 'Strongly Disagree' to [5] representing 'Strongly Agree,' with [1] indicating the lowest and [5] the highest level of agreement. Prior to actual study analysis, Cronbach's alpha test was used to ensure the internal consistency reliability of section C, D and E in the questionnaire. Cronbach alpha revealed that all sections demonstrated adequate internal consistency (>0.70), with the test results as follows: five items for attitudes (0.939), five items for perceptions (0.730) and five items for perceived barriers (0.843).

2.6. Statistical analysis

The data was analyzed using the IBM Statistical Package for the Social Sciences (SPSS) version 27. The determination of high and low willingness scores was established using a cut-off value from the average median score. Respondents with an average score below the median were categorized as having low willingness, whereas those with an average score equal to or above the median were

Table 1
Respondents Characteristics (n = 40).

Characteristics	Number of respondents, n (%)
Gender	
Male	7 (17.5)
Female	33 (82.5)
Age	
25–35 years old	29 (72.5)
36–45 years old	8 (20.0)
46–55 years old	3 (7.5)
Years since graduation	
<5 years	19 (47.5)
5–10 years	11 (27.5)
11–20 years	7 (17.5)
>20 years	3 (7.5)
Years in practice	
<5 years	19 (47.5)
5–10 years	11 (27.5)
11–20 years	8 (20.0)
>20 years	2 (5.0)
Education level	
Bachelor's degree	39 (97.5)
Master's degree	1 (2.5)

classified as having high willingness. For the ease of interpretation in results and discussion, the responses for questions that were measured using the 5-point Likert scale were consolidated into three groups; disagreed (strongly disagree and disagree), neutral and agreed (strongly agree and agree).

2.7. Ethical considerations

The study received approval by the Human Ethics Committee of Taylor's University under the reference number of HEC 2023/044.

3. Results

A total of 40 respondents participated, with 7 (17.5 %) being male and 33 (82.5 %) being female. Majority (72.5 %) of respondents were within the 25–35 years old. Regarding years since graduation. Around 47.5 % had graduated for less than 5 years while highest educational level achieved by the respondents was a bachelor's degree, accounting for 97.5 % of the participants (Table 1).

Respondents' previous collaboration with community pharmacists are shown in Fig. 1 while respondents' number of times of previous collaboration and method of communication with community pharmacists are presented in Fig. 2.

Only one quarter (n = 10, 25 %) of them indicated that they had engaged in interprofessional collaboration with pharmacists in the past (Fig. 1). Among the 10 veterinarians who had previously collaborated with pharmacists before, 60 % of them collaborated with pharmacists more than 3 times and were significantly more likely to use face-to-face as the method of communication with pharmacists (Fig. 2).

Majority (65 %) of the respondents expressed interest in collaborating with pharmacists to improve patient outcomes. However, when it comes to trusting the veterinary drugs knowledge and expertise of pharmacists, the responses exhibited no uniformity in the answers provided, indicating a wide array of opinions. (Table 2).

The highest extent (67.5 %) of agreement among the veterinarians was pharmacists referring pet owners to veterinarians appropriately. It also can be observed that the veterinarians perceived roles such as compounding medications for patients (55 %) and dispensing prescribed medications to pet owners (55 %) are equally important roles that can be played by pharmacists. Pharmacists having a strong, working knowledge of veterinary medications was ranked with the lowest level of agreement (27.5 %) among the 5 roles given (Table 3).

The veterinarians largely concurred that lack of confidence in pharmacist knowledge or skills regarding veterinary medications was perceived as the greatest barrier between veterinarians and pharmacists. The statement had the highest percentage of 'agree and strongly agree' response (82.5 %). This highlights that veterinarians were not confident towards pharmacists' knowledge and skills. More than 50 % of the respondents also came to an agreement that lack of face-to-face communication and lack of financial interest were also one of the prohibitive factors (Table 4).

Table 5 summarizes the willingness of the veterinarians towards collaborative practice with pharmacist. The cut-off value for the overall willingness score was 51. Thus, average score of less than 51 were categorized as having low willingness, and those with an average score equal to or more than 51 were considered to have high willingness. Based on the overall willingness, 55 % (n = 22) of the respondents expressed a high willingness towards collaborating with community pharmacists.

4. Discussion

The current result of this study revealed that there was limited contact between veterinarians and community pharmacists suggesting that working relationships were either in the early stages of development or non-existent which was consistent with studies conducted in United States [9]. The reasons of poor interaction between these two professions due to the Malaysian veterinarians were generally unaware about veterinary pharmacy practice, the scarcity of veterinary pharmacists (due to limited training opportunities, low demand and main focus on human healthcare) and veterinary pharmacies in the country, lack of veterinary pharmacy education coverage within the pharmacy curriculum or veterinarians were not confident in pharmacists' abilities, skill and knowledge in veterinary medicine.

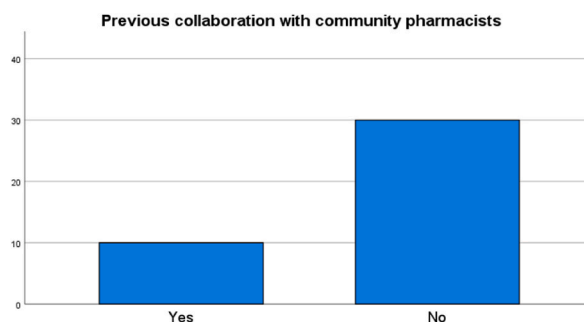


Fig. 1. Respondents' previous collaboration with community pharmacists.

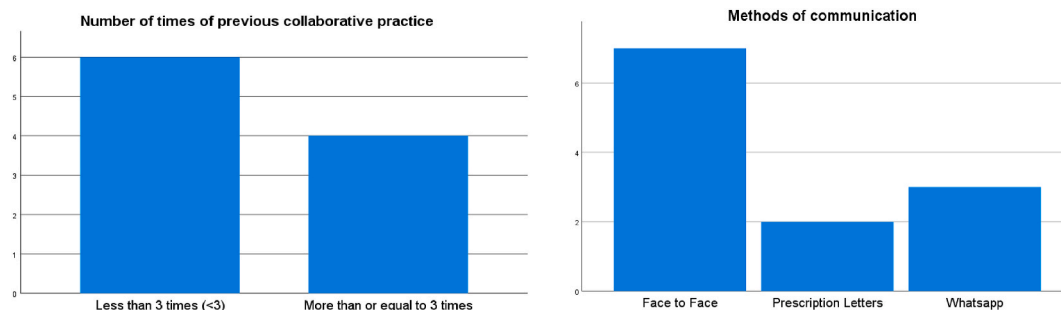


Fig. 2. Respondents' number of times of previous collaboration and method of communication with community pharmacists.

Table 2

Attitude towards collaborating with community pharmacists (n = 40).

Statement(s)	Disagreed, n (%)	Neutral, n (%)	Agreed, n (%)
Collaboration between community pharmacists and veterinarians is important to provide optimal patient ^a care.	6 (15.0)	10 (25.0)	24 (60.0)
Collaboration with community pharmacists improves patient ^a outcomes.	9 (22.5)	6 (15.0)	25 (62.5)
I think collaborating with community pharmacists can improve the safety and efficacy of veterinary drug use.	8 (20.0)	8 (20.0)	24 (60.0)
I trust the knowledge and expertise of community pharmacists when it comes to veterinary drugs.	14 (35.0)	13 (32.5)	13 (32.5)
I am interested in collaborating with community pharmacists to improve patient ^a outcomes.	7 (17.5)	7 (17.5)	26 (65.0)

^a Patient refers to the animal being treated.

Table 3

Perceived roles of the pharmacists in veterinary practice (n = 40).

Statement(s)	Disagree, n (%)	Neutral, n (%)	Agree, n (%)
Having a strong, working knowledge of veterinary medications	22 (55.0)	7 (17.5)	11 (27.5)
Referring pet owners to veterinarians when appropriate	6 (27.5)	7 (17.5)	27 (67.5)
Counselling pet owners on medication use	20 (50.0)	8 (20.0)	12 (30.0)
Compounding medications for ^a patients	7 (17.5)	11 (27.5)	22 (55.0)
Dispensing prescribed medication to pet owners	10 (25.0)	8 (20.0)	22 (55.0)

^a Patient refers to the animal being treated.

Table 4

Perceived barriers for collaboration (n = 40).

Statement(s)	Disagree, n (%)	Neutral, n (%)	Agree, n (%)
Lack of time	6 (15.0)	19 (47.5)	15 (37.5)
No financial interest	3 (7.5)	14 (35.0)	23 (57.5)
Lack of face-to-face communication	4 (10.0)	12 (30.0)	24 (60.0)
Lack of confidence in pharmacist knowledge or skills regarding veterinary medications.	1 (2.5)	6 (15.0)	33 (82.5)
Lack of belief that collaborative practice will improve outcomes of ^a patient.	13 (32.5)	12 (30.0)	15 (37.5)

^a Patient refers to the animal being treated.

Table 5

Overall willingness towards collaboration with community pharmacists.

	Score			Prevalence	
	Minimum	Maximum	Median	Low (n,%)	High (n,%)
Attitude towards collaboration	5	25	18	19 (47.5)	21 (52.5)
Perceived roles of pharmacists	5	25	16	18 (45.0)	22 (55.0)
Perceived barriers for collaboration	5	25	18	17 (42.5)	23 (57.5)
Overall Willingness	15	75	51	18 (45)	22 (55)

Findings from this result also revealed that veterinarians were more likely to use physical (face-to-face) communication when contacting pharmacists. Additionally, lack of face-to-face communication was also identified as one of the prohibitive factors in collaborative practice. These results emphasised the need to foster personal communication between the two professions. Veterinarians preferred physical communication as direct face-to-face communication allows involved parties not only can hear the spoken words but also able to observe the body language and facial expression which can convey crucial information, so they can better understand the intended meaning behind the words [11].

Promisingly, our findings also highlighted majority of veterinarians agreed that collaboration between community pharmacists and veterinarians can lead to optimized patient care which was similar to the research finding of Fredrickson et al. [9].

In regards with the perceived roles of community pharmacists involved in veterinary care, veterinarians generally viewed the pharmacists' roles to be predominately technical such as referring, compounding and dispensing prescriptions, placing less value on cognitive pharmacist functions such as counselling. Majority of the veterinarians perceived pharmacist referring pet owners to veterinarians when appropriate as the most important role of pharmacists can play as well as compounding and dispensing medication for animal patients. Similar findings were also reported from Bennett et al. [12]. Although community pharmacists possess comprehensive training in counselling within human medicine, which is regarded as one of their strengths, inadequate knowledge and resources in veterinary medicine may result in the delivery of inappropriate or illegal counselling to clients. This can be substantiated by findings from Dias et al. [13] and Snoussi & Ahid [14].

To facilitate an effective interprofessional collaboration, it is crucial to identify and address any barriers that would impede its implementation. By recognizing these obstacles, appropriate interventions can be developed to overcome them. One of the major barriers perceived by veterinarians in this study was lack of confidence in pharmacist knowledge related to veterinary practice. This finding can be supported by research funding of McDowell et al. [15]. In their findings, they revealed that veterinarians also had the same concern regarding approaching pharmacists for assistance. Given the lack of focus on veterinary pharmacotherapy education within the pharmacy curriculum and lack of veterinary pharmacies within Malaysia [16], it was reasonable that veterinarians may question the knowledge and skills of pharmacists in this area. Hence, veterinarians' concerns can be rectified through tertiary institutes incorporating veterinary pharmacy within the pharmacy curriculum. Theberge & Sehgal [17] suggested that veterinary pharmacy

education can be provided through elective courses or by integrating it into core pharmacotherapy courses. These courses should encompass various common companion animal conditions. For these conditions, students should be instructed in comparative pharmacotherapy, compounding, drug administration, and medication safety. Aside from that, Ceresia et al. [3] also proposed that pharmacy schools to offer certificate programmes for pharmacy students who have special interest in veterinary pharmacy and contemplate practicing in a setting that fills many prescriptions for animals. The objectives of this certificate programme must include students being able to understand the variations in domestic animals and humans' pharmacokinetics and physiology, knowledge of common animal disease conditions and providing drug information needed to support the pet owners and veterinarians.

The current findings also revealed that more than half of the respondents have a high willingness towards collaboration with community pharmacists. This finding was consistent with Fredrickson et al. (2020) Based on previous studies [15], veterinarians collaborating with pharmacists holds the potential for beneficial outcomes. Pharmacists can readily provide veterinarians with drug related information and pharmacists could also assist with medicine stock management issues and facilitate easier access of medicine that are not often used in the veterinary setting. With this concurrence, initiatives to enhance collaboration can be designed and piloted, and subsequent research can evaluate the impact of these strategies.

In addition, to enhance collaboration between veterinarians and community pharmacists, it is crucial to address the regulatory frameworks governing each profession and their respective responsibilities. Clear and well-defined regulations can significantly improve mutual confidence and effectiveness in their collaborative efforts [18]. In Malaysia, while the Veterinary Surgeons Act 1974 and the Poison Act 1952 outline the roles of veterinarians and pharmacists respectively, there may be gaps in how these regulations facilitate interprofessional collaboration. Addressing these regulatory aspects can help establish a clearer understanding of each profession's role, foster effective communication, and ultimately improve patient outcomes.

5. Limitations

The study was only conducted in a small district in Malaysia; hence the finding of this study is not generalizable. Future studies may attempt to gather data from a wider selection of veterinarians who practice in private veterinary clinic settings.

6. Conclusion

In conclusion, veterinarians demonstrated positive willingness in collaboration with pharmacist. Addressing this is crucial for optimizing veterinary patient care. In Malaysia, there is a specialization of pharmacist in veterinary pharmacists, however, its prevalence and activity remain limited. To further enhance this, it is crucial to address these issues and explore mechanisms to increase the number and activity of veterinary pharmacists in Malaysia. Potential strategies include introducing specialized educational modules, establishing certification programs supported by professional bodies such as the Malaysian Pharmaceutical Society, and fostering greater interprofessional collaboration. Identifying educational and interprofessional initiatives can prove instrumental in clarifying roles and fostering a synergistic relationship between pharmacists and veterinarians in community practice. By implementing these strategies, the number of veterinary pharmacists could be increased, thereby enhancing the quality of animal healthcare in Malaysia. Future research endeavors could further explore potential barriers to effective collaboration and delve into the preferred methods of communication between these healthcare providers.

Declaration of funding

None.

Data sharing statement

All data have been included in the manuscript.

Ethics approval

The study received approval by the Human Ethics Committee of Taylor's University under the reference number of HEC 2023/044.

Disclosure of interest

Declared none.

Data availability statement

Data available within the article or its supplementary materials.

CRediT authorship contribution statement

Ganesh Sritheran Paneerselvam: Writing – original draft, Validation, Supervision, Methodology, Conceptualization. **Ru Wei Lee:** Writing – original draft, Validation, Methodology, Investigation. **Muhammad Junaid Farrukh:** Writing – review & editing, Validation, Formal analysis, Data curation. **Yousef Mohammed A. Alhamda:** Writing – original draft, Visualization, Validation. **Sulaiman Mohammed Alsultan:** Writing – review & editing, Software, Resources. **Pakhrur Razi:** Writing – review & editing, Visualization, Validation, Software, Investigation. **Khang Wen Goh:** Writing – original draft, Validation, Resources, Formal analysis. **Long Chiau Ming:** Writing – review & editing, Validation, Software, Resources.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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