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Original Research

Future perspectives on household pharmaceutical management and medication administration for companion animals in Japan

Taisuke Konno, Hiroyuki Suzuki, Daisuke Kikuchi, Yosuke Nishikawa, Shigeki Kisara, Hitoshi Nakamura, Yuriko Murai

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Abstract

Background: Companion animals are increasingly viewed as family members, with growing attention to their health and well-being. However, improper storage and use of medications at home can pose risks such as accidental ingestion by companion animals or children, health deterioration due to drug exposure, and environmental harm. In Japan, while the demand for advanced veterinary care is rising, there is limited information on how medications for companion animals are managed and administered at home. **Objective:** This study aimed to investigate, for the first time, the real-world practices and challenges related to the storage, handling, and administration of medications for companion animals in Japanese households. Methods: A questionnaire survey was conducted between April and July 2024 via Google Forms. The survey addressed two key aspects: medication storage and management, and administration difficulties experienced by owners. Ethical approval was obtained from the Tohoku Medical and Pharmaceutical University Ethics Committee. **Results:** A questionnaire was distributed to 2862 companion animal owners, and 191 responses were received (response rate: 6.7%). Most respondents were women in their 50s or 60s living in the Kanto region, and dogs were the most common companion animals. Medication storage practices were generally appropriate, although some instances of storage in high-humidity or unstable-temperature areas were observed. There were 10 cases reported in which companion animals either accidentally ingested or attempted to ingest human medications. While many owners reported no difficulties with medication administration, others highlighted challenges such as companion animals spitting out the medication, bitterness of medications, and difficulties adjusting administration times to personal schedules. Approximately 20% of the owners modified medications prior to administration, including crushing tablets or measuring liquids. **Conclusion:** This study provides initial insights into medication management for companion animals in Japanese households. Although storage was largely appropriate, issues related to administration and accidental ingestion were identified. This study highlights the potential role of pharmacists in supporting appropriate veterinary medication use through formulation adjustments and pharmaceutical care, ultimately improving adherence and reducing stress for both owners and companion animals.

Keywords: veterinary pharmacy, veterinary pharmacist, companion animal, pharmaceutical management, medication administration

Taisuke Konno*. Assistant Professor, PhD; Division of Clinical Pharmaceutics, Faculty of Pharmaceutical Sciences, Tohoku Medical and Pharmaceutical University. tkonno@tohoku-mpu.ac.jp
Hiroyuki Suzuki. Lecturer, PhD; Division of Clinical Pharmaceutics, Faculty of Pharmaceutical Sciences, Tohoku Medical and Pharmaceutical University. hsuzuki@tohoku-mpu.ac.jp
Daisuke Kikuchi. Lecturer, PhD; Division of Community Medicine and Pharmacy, Faculty of Pharmaceutical Sciences, Tohoku Medical and Pharmaceutical University. d.kikuchi@hosp.tohoku-mpu.ac.jp
Yosuke Nishikawa. Research Associate, BS; Clinical Pharmacy Practice Center, Faculty of Pharmaceutical Sciences, Tohoku Medical and Pharmaceutical University. y.nishikawa@tohoku-mpu.ac.jp
Shigeki Kisara. Professor, PhD; Clinical Pharmacy Practice Center, Faculty of Pharmaceutical Sciences, Tohoku Medical and Pharmaceutical University. kisara.shigeki@tohoku-mpu.ac.jp
Hitoshi Nakamura. Professor, PhD; Division of Clinical Pharmaceutics, Faculty of Pharmaceutical Sciences, Tohoku Medical and Pharmaceutical University. nakamura@tohoku-mpu.ac.jp
Yuriko Murai. Specially Appointed Professor, PhD; Division of Clinical Pharmaceutics, Faculty of Pharmaceutical Sciences, Tohoku Medical and Pharmaceutical University. y-murai@tohoku-mpu.ac.jp

INTRODUCTION

Companion animals are regarded as family members worldwide, and their health and well-being are highly valued. With this growing momentum, potential risks associated with the improper storage and use of medicines at home, including accidental ingestion by companion animals and children[1] and health deterioration due to drug exposure and environmental pollution[2], have been reported in several countries. Similarly, the demand for advanced and diverse veterinary care is increasing in Japan[3]. Collaborative veterinary care has the potential to improve the quality of care for companion animals[4]; however, information about the medications used for companion animals and their management and proper use at home remains limited. The aim of this study was to investigate, for the first time, the management and administration of pharmaceuticals for companion animals in Japanese households.

METHODS

A questionnaire survey was conducted via Google Forms from April 1 to July 31, 2024. The participants were companion animal owners visiting three veterinary hospitals. The survey covered two key aspects—medication storage and management and administration challenges. No specific number of responses per facility was set, and each participant completed the survey just

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once. Respondents provided online informed consent before participation. This study was approved by the Ethics Review Committee of Tohoku Medical and Pharmaceutical University (approval no.: 2023-0-040).

RESULTS

A questionnaire was distributed to 2862 companion animal owners, and 191 responses were received (response rate: 6.7%). Of the 191 respondents, most were women in their 50s or 60s, living in the Kanto region. Dogs were the most common companion animals, with the majority being kept fully indoors. Many had visited a single clinic and used one or two medications (Table 1). The most common response regarding medication administration difficulties was that there were no issues (N = 107). Some respondents reported problems such as companion animals spitting out the medication even when administered with food (N = 37), bitterness (N = 23), the size or form of the medication (N = 13), and difficulty coordinating administration times with work schedules (N = 16) (Table 2). Medication storage locations included kitchen racks (24.6%; N = 47), living room shelves (17.8%; N = 34), and refrigerators (15.7%; N = 30) (Figure 1a). While most medications were stored properly, some were placed in areas with fluctuating temperature and humidity—for example, on the top of refrigerators or in bathrooms (Figure 1b). Additionally, 19.9% (N = 38) of companion animal owners prepared the medications before administration; this included tablet splitting, crushing, liquid measuring with syringes, and capsule filling (Figure 2). Moreover, there were 10 cases of companion animals accidentally ingesting the owner's medications or attempting to ingest medications when they were accidentally dropped on the floor (Table 3).

Table 1. Characteristics of the respondents and companion animals.

Characteristic		N (%)	Total
Sex	Male	30 (15.7)	191
	Female	159 (83.2)	
	Others	2 (1.1)	
Age (years)	10–19	0 (0.0)	191
	20–29	3 (1.6)	
	30–39	19 (10.0)	
	40–49	40 (20.9)	
	50–59	79 (41.4)	
	60–69	44 (23.0)	
	≥70	6 (3.1)	
Region	Kanto	115 (60.2)	191
	Chubu	61 (31.9)	
	Kinki	15 (7.9)	
Number of family members	1	3 (1.6)	191
	2	58 (30.4)	
	3	65 (34.0)	
	4	43 (22.5)	
	≥5	20 (10.5)	
	No answer	2 (1.0)	
Animal species (listed as total number of animals)	Dog	194	332
	Cat	117	
	Others	21	
Where the companion animal spends time	Fully indoors	162 (84.9)	191
	Mainly indoors	27 (14.1)	
	Mainly outdoors	1 (0.5)	
	Fully outdoors	1 (0.5)	
Number of hospitals visited	1	139 (72.7)	191
	2	25 (13.1)	
	3	2 (1.1)	
	4	2 (1.1)	
	No answer	23 (12.0)	
Number of prescription drugs	0	14 (7.3)	191
	1	71 (37.2)	
	2	52 (27.2)	
	3	15 (7.9)	
	4	14 (7.3)	
	5	11 (5.8)	
	6	4 (2.1)	
	7	1 (0.5)	
	≥8	7 (3.7)	
	No answer	2 (1.0)	

DISCUSSION

Although medication storage in our Japanese study population was generally appropriate, some instances of improper storage and accidental ingestion were observed. Proper storage of pet medications offers important benefits for overall household medication safety by reducing potential risks. Therefore, advice and educational activities regarding pharmaceutical management by pharmacists would be beneficial in preventing health hazards in companion animals and children, and promoting the proper use of medications.

Some companion animal owners experienced difficulties administering medications, and approximately 20% engaged in preparation tasks, indicating that dosage forms and palatability require improvement. This can be attributed to the following factors: compared to humans, dogs have a highly developed sense of smell and can detect even the faintest odors[5]. Additionally, cats are extremely sensitive to bitter taste[6], which is one of the reasons medication administrations can be challenging for owners. In order to adjust the taste and palatability of medicines administered to companion animals, there is a need for pharmacies that fill prescriptions from veterinary clinics. However, currently, such pharmacies are

Table 2. Owners' issues and questions regarding their companion animal's medication.

Response	N
None	107
Even when given with food, the medicine is spit out.	37
Food mixed with medicine is left uneaten.	29
It is difficult to get the companion animal to take bitter medicines.	23
Once the companion animal realizes that medicine has been mixed with food, it does not eat anything.	17
It is difficult to coordinate medication times with work schedules.	16
I must hold the companion animal down and forcefully administer medicine.	16
The medicine is large or in powder form, making it difficult to administer.	13
The companion animal runs away or struggles, making it impossible to administer medicine at the desired time.	8
The companion animal moves around and struggles, making it difficult to administer eye drops properly.	8
Preparing and administering subcutaneous drips are a burden.	3
Others	4

Multiple answers were allowed. There was a total of 281 responses from 191 owners

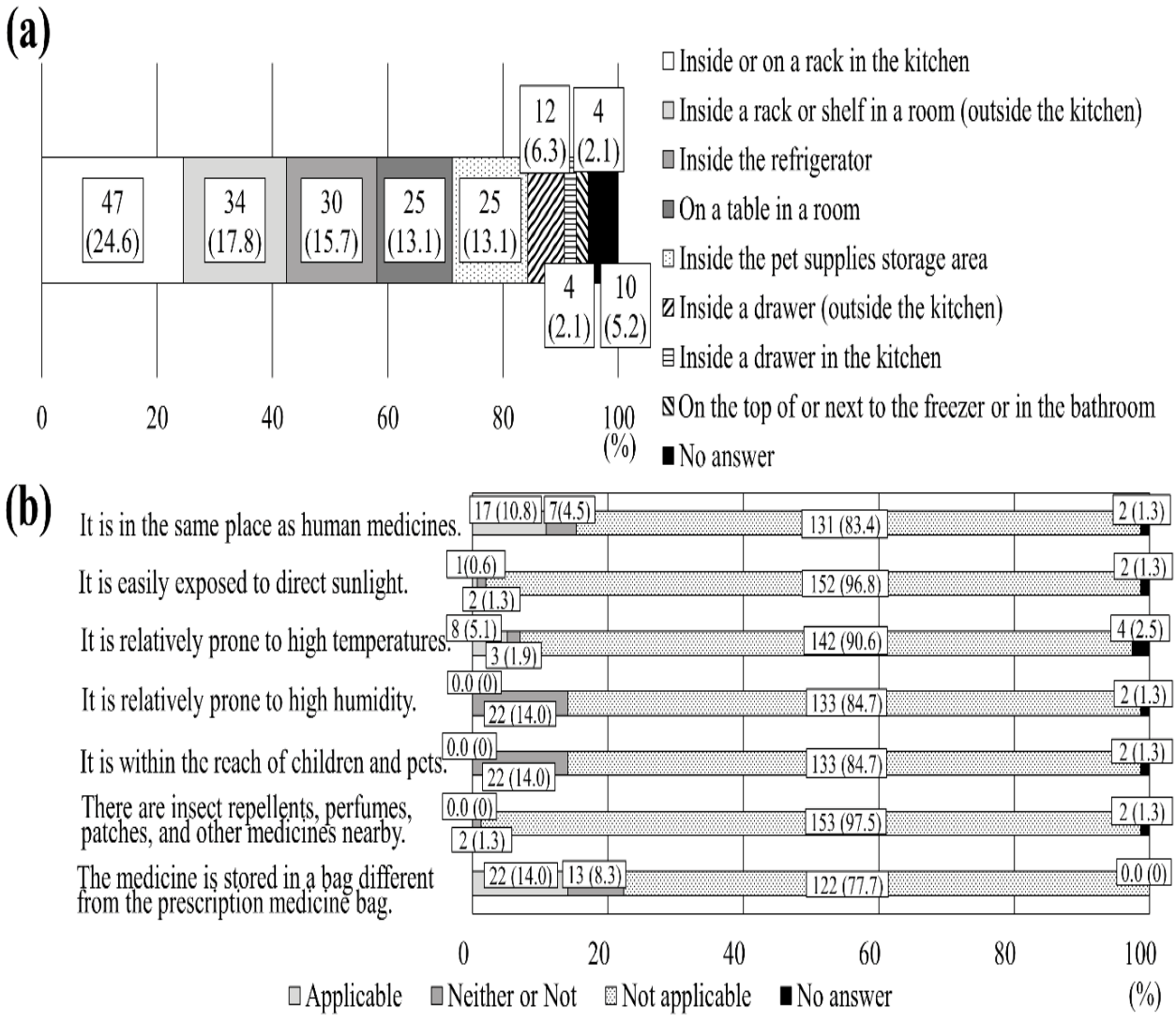

Figure 1. Storage location and conditions for companion animal medicines. (a) Storage location for companion animal medicines (N =1 91). (b) Storage conditions for companion animal medicines (N = 157). In the figure, the values are expressed as N (%).

Table 3. Details of the accidental ingestion or attempted accidental ingestion by a companion animal.

Classification	Response
Accidental ingestion (5 cases)	Accidentally ingested an antipsychotic drug.
	Accidentally ingested a human sleeping pill.
	Accidentally ingested a human medicine.
	Chewed the owner's loxoprofen sodium.
	Chewed the human medicine while playing when under 1 year old.
Attempted accidental ingestion (5 cases)	A companion animal almost ingested medication dropped on the floor, mistaking it for a snack.
	When the owner accidentally dropped the medication, the companion animal attempted to eat it. In response, the owner quickly stepped on the medication to prevent ingestion. Following this incident, the owner stopped taking the medication in the living room.
	The companion animal attempted to eat the ointment.
	The owner had left a laxative within reach of the companion animal, and while stepping away to get some water, the companion animal came into contact with the laxative.
	The owner was attempting to take the medication but dropped it on the floor, and the companion animal attempted to eat it.

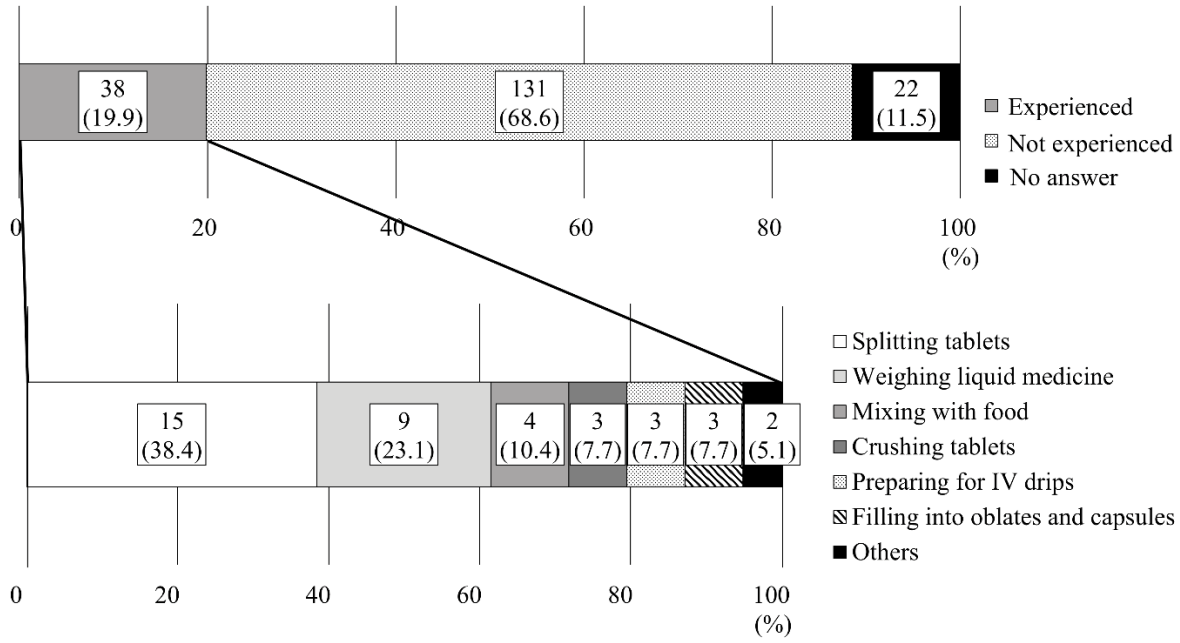

Figure 2. Preparatory work before administering medicines to companion animals and the related details (N = 191).
In the figure, the values are expressed as N (%). Of the 38 responses marked as "Experienced," one included multiple answers.

scant in Japan[4]. Therefore, given the challenges associated with companion animal medication administration, there is room for pharmacists to be involved by providing formulation adjustments and pharmaceutical support to facilitate easier administration of medications. This effort could facilitate the development and implementation of medication formulations better suited for administration, through the modification of dosage forms, adjustment of administration routes, alternative medication suggestions, or improvements in palatability through flavoring or bitterness masking with innovative dispensing methods. Through dispensing, pharmacists can optimize the effectiveness of medications prescribed by veterinarians and adjust formulations to make administration easier for owners and more acceptable for companion animals. This approach may reduce the burden on owners and companion animals and contribute to the appropriate use of companion animal medicines.

A limitation of this study is its low response rate. Therefore, the results may have been affected by selection biases, such as attracting participants interested in companion animal medication management. However, this study is the first to investigate the management and administration of pharmaceuticals for companion animals in Japanese

households, providing valuable insights into companion animal owners' challenges and highlighting the need for greater pharmacist involvement in veterinary medicine. Future research should focus on real-world cases where pharmacists dispense medications for companion animals and evaluate the effectiveness of this process.

CONCLUSION

This study provides the first insights into companion animal medication practices in Japanese households. While storage practices were generally appropriate, issues such as accidental ingestion and administration challenges were noted. These findings underscore the need for better dosage forms and the involvement of pharmacists to support safer, more effective veterinary medication use.

AUTHOR CONTRIBUTIONS

Conceptualization, T.K., H.S., H.N., and Y.M.; Funding acquisition, T.K., H.S., H.N., and Y.M.; Methodology, T.K., H.S., H.N., and Y.M.; Formal analysis, T.K., H.S., H.N., and Y.M.; Writing—original draft, T.K., H.S., D.K., H.N., and Y.M.; Writing—review and editing, T.K., H.S., D.K., Y.N., S.K., H.N., and Y.M.; Visualization, T.K., D.K., and Y.M.; Supervision, T.K. and Y.M.; Project administration, T.K. and Y.M. All authors have read and agreed to the published version of the manuscript.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

References

1. Lee S, Schommer JC. Medication use and storage, and their potential risks in US households. Pharmacy 2022 Feb 9;10(1):27. https://doi.org/10.3390/pharmacy10010027.
2. Kelly F, McMillan S, Spinks J, Bettington E, Wheeler AJ. You don't throw these things out:' an exploration of medicines retention and disposal practices in Australian homes. BMC Public Health 2018 Aug 17;18(1):1026. https://doi.org/10.1186/s12889-018-5753-6.
3. Keiji F. The current situation surrounding veterinary medicine and the role of the Japan Veterinary Medical Association. J Jpn Vet Med Assoc 2024;77: 418-22.
4. Konno T, Suzuki H, Suzuki N, Okada K, Nishikawa Y, Kikuchi D, Nakamura H, Murai Y. Current situation for pharmacists in Japanese veterinary medicine: Exploring the pharmaceutical needs and challenges of veterinary staff to facilitate collaborative veterinary care. Pharmacy 2024 Nov 29;12(6):179. https://doi.org/10.3390/pharmacy12060179.
5. Quignon P, Kirkness E, Cadieu E, Touleimat N, Guyon R, Renier C, Hitte C, André C, Fraser C, Galibert F. Comparison of the canine and human olfactory receptor gene repertoires. Genome Bio. 2003;4(12): R80. https://doi.org/10.1186/gb-2003-4-12-r80.
6. Lei W, Ravoninjohary A, Li X, Margolskee RF, Reed DR, Beauchamp GK, Jiang P. Functional analyses of bitter taste receptors in domestic cats (*Felis catus*). PLoS One 2015 Oct 21;10(10): e0139670. https://doi.org/10.1371/journal.pone.0139670.

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