

Original Article

Canine behavioral problems and their effect on relinquishment of the Jindo dog

Young-Mee Kim^{1,†}, Sun-A Kim^{1,†}, Sang-Mok Lee², Yoon-Ju Choi³, Byung-Joo Kim⁴, Nam-Shik Shin^{1,*}

¹College of Veterinary Medicine, Seoul National University, Seoul 151-742, Korea

²Department of Physiology, College of Veterinary Medicine, Konkuk University, Seoul 143-701, Korea

³Samsung Canine Center for Companionship (SCCC), Samsung Everland, Yongin 449-715, Korea

⁴School of Oriental Medicine, Pusan National University, Pusan 609-735, Korea

The purpose of this study was to evaluate behavior problems of the Jindo dog, the native dog of Korea, based on an owner's survey and their effect on pet relinquishment. To live a better life with their own pet and prevent relinquishment, it is important to understand the innate behavior characteristics of dog breed and the potential causes of relinquishment. Information concerning various factors and demonstration of the five most common behavior problems was collected via 189 completed questionnaires. No factors significantly affected the demonstration of behavior problem. A total 151 of 189 dogs had behavior problems (79.9%) and 38 dogs did not have behavior problems (20.1%). Among 151 dogs, 139 dogs showed single behavior problem (92.1%). They were 'excessive excitability' (46.8%), 'excessive vocalization' (30.2%), 'inappropriate elimination' (17.3%), 'destructive behavior' (4.3%), and 'aggressive behavior' (1.4%), respectively. In addition, 12 dogs showed two concurrent behavior problems (7.9%) According to the results, the relinquishment of Jindo dogs was not significantly associated with canine behavior problems, which is the single greatest risk factor of relinquishment in general. The possible reasons for potential behavior problems include improper raising, lack of socialization, and insufficient dog training classes, therefore canine behavior would be improved by owner education.

Keywords: canine behavior problem, Jindo dog, Korean native dog, relinquishment

Introduction

The Jindo dog, also called the Korea Jindo dog and Korean

Jindo, originated from Jindo Island off the southwest end of the Korean Peninsula, but is now found all over Korea [5-7,10]. It is a medium-sized Asian spitz breed and comes in a variety of colors such as white, fawn, red, black, black-and-tan, tiger stripe, salt-and-pepper, and spotted. Fawn and white are the most prevalent coat colors [7,10]. The height range is 45 ~ 53 cm, the weigh range is 16 ~ 22 kg, and this breed has bright eyes, erected ears, and rolled or sickle-shaped tails with acute hearing and sense of smell [5,10]. The Jindo dog is well-known as a hunting and watch dog, and in addition it is celebrated for its high-spirit, intelligence, bravery, and loyal nature with a smart appearance and whole-hearted devotion to its owner [6,10]. They are also praised for their hygiene, easy house training, very kind and faithful temperament toward their owners, and rarely barking in familiar environments. Nowadays, the Jindo dog is kept as an affectionate companion dog. In 1962, the Korean government designated the Jindo dogs as natural monument No. 53, a title which is given to animals, plants, minerals, caves, geological features, biological products, and special natural phenomena that carry great historic, cultural, scientific, aesthetic, or academic values [6,7,10]. In 1967, 'The Jindo Preservation Ordinance' was established by law and 'Jindo Dog Research and Testing Center' was founded to actively preserve the breed in 1999. The Center evaluates 6-month-old puppies and if the puppy is deemed to meet the breed standard, then it is micro-chipped and registered, then managed under the auspices of the Korean government [10]. In 2005, the Jindo dog was registered in the Federation Cynologique Internationale (Belgium) as the Korea Jindo dog and in the Kennel Club (UK) as the Korean Jindo [6,7,10].

The number of households with companion dogs has increased since 2000, and approximately one in six households has more than one dog. The Jindo dog ranked 8th in the list of canine breeds kept as pets, falling behind other foreign breeds, and was found in only 4% of households that had a pet dog [8].

*Corresponding author

Tel: +82-2-880-1260; Fax: +82-2-880-1216

E-mail: nsshin@snu.ac.kr

†The first two authors contributed equally to this work.

Undesirable or inappropriate canine behavior in domestic dogs causes great distress in owners, and is likely to destroy the owner-dog bond [3]. Furthermore, behavior problems represent the single most serious risk factor of pet relinquishment, and approximately 50% owners give up their dogs because of canine behavior problems [14,16]. A study on canine behavior problems in Seoul also determined that relinquishment and abandonment was significantly associated with demonstration of behavior problems [8].

This study was aimed to evaluate the reasons of relinquishment of the Jindo dog regarding behavior problems and association with various factors such as the dog's gender, sterilization status, age, housing condition, and amount of exercise and/or training per day. Additionally, the five most common behavior problems such as 'excessive vocalization', 'destructive behavior', 'excessive excitability', 'inappropriate elimination', and 'aggressive behavior' were evaluated in the Jindo dog.

Materials and Methods

Subjects

The study was carried out by a survey using the questionnaire 'Canine Behavior Problems of the Jindo dog'. The questionnaire was distributed to people of the four provinces (Seoul, Incheon, Gyeonggi, and Chungnam) in Korea. Six researchers were recruited to administer this survey and asked people whether they currently owned a Jindo dog or had previously owned one within the past 10 years. The subjects were selected from public places like schools, public parks, hospitals, and markets. In order to avoid biased results, Jindo dog breeders and kennel club members were excluded. One hundred and eighty-nine questionnaires were successfully completed. Anonymity was guaranteed to all respondents.

Table 1. Checklist of the 'Canine Behavior Problems of the Jindo dogs' questionnaire

Various factors	Checklist
1. Gender	① Male ② Female
2. Sterilization status	① Neutered ② Intact
3. Age (year)	① 1-2 ② 3-5 ③ 6-8 ④ Over 9
4. Housing condition	① At a yard individual house ② Inside a house or apartment ③ At a basement or rooftop ④ Others
5. Time of exercise and/or training (playing, walking) per day	① None ② Less than 30 min ③ 30-60 min ④ Over 1 h
6. Five most common behavior problems	
a. Excessive vocalization (including excessive barking, whining, howling)	① No ② Yes
b. Destructive behaviors (including chewing, digging, escaping)	① No ② Yes
c. Excessive excitability (including disobedience, unruliness)	① No ② Yes
d. Inappropriate elimination (including house-soiling)	① No ② Yes
e. Aggressive behavior (including growling, attacking, biting)	① No ② Yes
7. Relinquishment	① No ② Yes

The 'Canine Behavior Problem of the Jindo dog' questionnaire

General information about various factors upon Jindo dog which participated in this study were collected such as gender, sterilization status, age, housing condition, and time of exercise and/or training per day (Table 1). The study participants were asked about time devoted to activities related to exercising and/or training the Jindo dog such as playing and walking, but time spent simply being together with the owners without any exercise and/or training was excluded. The owners were also asked whether they had actual experience in relinquishing Jindo dogs and/or whether they were seriously considering relinquishing their pet. The selection of five most common behavior problems such as 'excessive vocalization' (including excessive barking, whining, and howling), 'destructive behavior' (including chewing, digging, and escaping), 'excessive excitability' (including disobedience and unruliness), 'inappropriate elimination' (including house-soiling), and 'aggressive behavior' (including growling, attacking, and biting) was based on previous studies [1,3,9,14-16].

Statistical analysis

Pearson's chi-squared test was used to evaluate the

association between demonstration of behavior problems and various factors such as gender, sterilization status, age, housing condition, and time of exercise and/or training per day. Association with pet relinquishment and various factors was also assessed by this analysis. All statistical analyses were performed using statistical analysis software (SPSS-version 15.0; SPSS, USA) with $p < 0.05$ considered as statistically significant.

Results

General demographic information

One hundred eighty-nine surveys were completed and there were approximately twice as many male (65.1%) than female (34.9%). The majority was intact (85.2%). The number of Jindo dogs younger than 2 years old (45%) and 3 ~ 5 years old (45%) were equally distributed, but a few were over 9 years of age (5.3%). The mean age was 3.0 years with a range of 1 to 10 years. The majority of Jindo dogs were housed in a yard of an individual house (75.1%). Over 65% of the dogs spent approximately 30 ~ 60 min per day exercising and/or training, but it was noted that 14.8% of dogs were provided no time for daily exercise or training (Table 2).

Table 2. General demographic information

Various factors	Number of animals*	%	
Gender	Male	123	65.1
	Female	66	34.9
Sterilization status	Neutered	28	14.8
	Intact	161	85.2
Housing condition	Yard of a single family house	142	75.1
	Inside a house or apartment	28	14.8
	Basement or on a rooftop	8	4.2
	The others	11	5.8
Age (years)	1-2	85	45.0
	3-5	85	45.0
	6-8	9	4.8
	Over 9	10	5.3
Time of exercise and/or training per day (min)	None	28	14.8
	30	28	14.8
	30-60	123	65.1
	over 60	10	5.3
Demonstration of behavior problems	No	38	20.1
	Yes	151	79.9
Number of behavior problems per dog	0	38	20.1
	1	139	73.5
	2	12	6.4
Relinquishment	No	132	69.8
	Yes	57	30.2

*Total number: 189.

Five most common behavior problems

A total 151 of 189 dogs had behavior problems (79.9%) and 38 dogs did not have behavior problems (20.1%) (Table 2). Among 151 dogs, 139 dogs showed single behavior problem (92.1%). They were 'excessive excitability' (46.8%), 'excessive vocalization' (30.2%), 'inappropriate elimination' (17.3%), 'destructive behavior' (4.3%), and 'aggressive behavior' (1.4%), respectively. In addition, 12 dogs showed two concurrent behavior problems (7.9%) (Table 2). Seven Jindo dogs (58.3%) showed excessive excitability and excessive vocalization, three dogs (25%) showed excessive vocalization and inappropriate elimination, and two dogs (16.7%) showed excessive vocalization and destructive behavior, concurrently.

Relinquishment of Jindo dogs

Fifty-seven Jindo dogs (30.2%) in the survey were associated with relinquishment. Fourteen dogs had actually been relinquished by their owners, and 43 owners stated that they were seriously considering relinquishing their pet Jindo dogs (Table 2). Despite the finding that Jindo dogs associated with relinquishment were reported to have more than one behavior problem, relinquishment was not significantly associated with demonstration of behavior problems ($p = 0.267$). Additionally, each of the five most common behavior problems did not significantly affect the rate of relinquishment (Table 3). Jindo dog relinquishment was not significantly associated with some factors such as behavior problems per dog ($p = 0.315$), sterilization status ($p = 1.000$), housing condition ($p = 0.281$), or age ($p = 0.342$).

Table 3. Differences of p -values for the degree of association with relinquishment and various factors, and with the five most common behavior problems

Various factors	Dog relinquishment (p -value)
Gender	0.049*
Sterilization status	1.000
Age (years)	0.342
Housing condition	0.281
Time of exercise and/or training per day	0.007*
Demonstration of behavior problems	0.267
Number of behavior problems per dog	0.315
Excessive vocalization	0.303
Destructive behavior	0.300
Excessive excitability	0.325
Inappropriate elimination	0.202
Aggressive behavior	0.356

* $p < 0.05$.

Discussion

Canine behavior problems are collectively the single greatest risk factor of relinquishment of dogs according to many studies [1,8,9,14,15]. We therefore hypothesized that the relinquishment of Jindo dogs would be related to behavior problems. Thus, the questionnaires in our study mainly asked about the behavior problems of the Jindo dog, and the purpose of this study was to evaluate effects of behavior problems on Jindo dog relinquishment. Our results indicated that behavior problems were not a significant risk factor of the relinquishment of Jindo dogs. Consequently, the causes of relinquishment might be affected by some other factors except behavior problems.

In general, the age of the dog is significantly associated with behavior problems and relinquishment, and younger than two years old tend to show more behavior problem [8,14,15]. However, we found that age did not affect the appearance of behavior problems and subsequent relinquishment of the Jindo dog. Typically, sterilization status is a risk factor for behavior problems [4] and over 50% dogs showing behavior problems are intact males [9]. Nevertheless, sterilization status was not significantly associated with behavior problems in the Jindo dog. Mondelli *et al.* [12] found that male dogs showing behavior problem are at great risk for being returned to a rescue shelter. However, this study determined that there was no association between gender and demonstration of behavior problems. In the Jindo dog, the demonstration of behavior problems was not significantly affected by gender, but relinquishment was significantly associated with gender. It was noted that the dogs associated with relinquishment were all intact males while no female were associated with relinquishment. No study has been performed about gender-based preference of dog adoption in Korea. Nevertheless, it seems that Koreans tend to prefer females because of animal's temperament and ability to produce offspring. Thus, female Jindo dogs are about 30 ~ 50% more expensive than males in the Korean pet market. This may influence the gender differences in relinquishment frequency.

According to previous studies, there is no significant association between housing conditions, demonstration of behavior problems, and relinquishment [18], however having a house with a yard, garden, or a terrace is very important for better management of dogs and can influence the length of the adoption period [13]. In another study, the relinquishment is significantly associated with time dedicated to exercising and/or training per day in Korea [8]. In this study, Jindo dogs that were provided with insufficient time for exercise and/or training per day were likely to be at risk of relinquishment ($p < 0.05$). Dogs are social animals which needed complex animate or inanimate stimulation such as social contact, playing,

walking, and training [17,18]. Play and exercise sessions should be a part of the daily routine, and insufficient play or stimulation can be an underlying cause for many behavior problems. If dogs are not provided with sufficient mental and/or physical stimulations, they are less trainable and showing behavior problem which results in relinquishment [9,14]. As a high-energetic hunting breed, the Jindo dog requires sufficient exercise and/or training to consume its abundant energy. This will also contribute to strengthening the owner-dog bond and prevent relinquishment. When people are interested to adopt a dog as a pet, they consider appearance and behavior characteristics of the dog breed. To live a better life with their own pet and prevent relinquishment, it is important to understand the innate behavior characteristics of dog breed and the potential causes of relinquishment. All breed of dog has their own behavior characteristics, and it could be developed into unwanted behavior problems when environment does not satisfy animals' needs. Most of the dog breed has potential behavior problems, for better understandings of Jindo dogs, we evaluated behavior problems based on owner's survey. In this study, the behavior problem most frequently demonstrated by the Jindo dog was 'excessive excitability'. This problem is common among dogs with abundant energy, and is often seen in hunting or working breeds [11]. If environmental stimuli and/or sufficient exercise and training are limited, the Jindo dog is likely to show 'excessive excitability'. 'Excessive vocalization' as the second most behavior problem of the Jindo dog also represented a large portion of reported behavior problems, and many owners complain about 'excessive vocalization' to behaviorists. In general, 'excessive vocalization' is associated with older dogs, insufficient environmental stimuli, and 'hyperactivity' without any medical reasons [1]. In the Jindo dog, age was not significantly associated with the demonstration of 'excessive vocalization'. However, it was hypothesized that 'excessive vocalization' might be related with 'excessive excitability' in the Jindo dog. Excessive vocalization and excitability might be induced by hyper-sensitivity to social stimuli such as novel objects, other animals, sounds, and unfamiliar people. Kim *et al.* [6] reported that the daily socialization program applied to Jindo dog puppies from the 7th to 13th week after birth shows significant effects not on social reactions towards humans and other dogs or fearful reactions towards social stimuli, but on playful reactions towards novel stimuli and other dogs. In order to minimize the Jindo dogs' sensitivity to various stimuli and make them more sociable and friendly toward people, especially unfamiliar men, many trials are being conducted to apply socialization programs starting from an early age [6].

Quite a few Jindo dogs have been described as demonstrating 'aggressive behavior' because 'aggressive behavior' towards people might lead to death or serious

injuries, and this behavior problem is considered to be the most serious behavioral-related reason for relinquishment and euthanasia [2,14,16]. Dog bites have received much attention as a public danger as well as a current major public health issue [13].

The Jindo dog originated from an isolated island with a harsh environment. To survive under these conditions, they had to be energetic, watchful, alert, fearless, loyal, and obedient. Since owners have tried to maintain these original qualities [10], it is well-known that the typical Jindo dog generally gives its devotion whole-heartedly to its owner, but seems to resent being touched by individuals it does not know and will not show affection towards a stranger [6,10]. Some subjective descriptions of Jindo dog temperament have been reported, and they indicate that dogs of this breed, as a rule, are not friendly towards strangers [10]. For these reasons, the Jindo dog is suitable for being a watchdog and hunting dog. These are the Jindo dog's basic characteristics, so owner rarely recognize them as behavior problems *per se*. However, the dog's characteristics can be risk factors for relinquishment [10].

The survey research is one of the limited methods, therefore more detailed questionnaires or various research methods would be needed for future studies for better understandings of Jindo dogs. In conclusion, canine behavior problems known collectively as the single most serious risk factor for relinquishment was not significantly associated with relinquishment of the Jindo dog.

Acknowledgments

This study was supported by the Research Institute for Veterinary Science, Seoul National University.

References

1. **Beaver BV.** Canine Behavior: A Guide for Veterinarians. 1st ed. pp. 267-287, Saunders, Philadelphia, 1999.
2. **Cameron DB.** Canine dominance-associated aggression: concepts, incidence, and treatment in a private behavior practice. *Appl Anim Behav Sci* 1997, **52**, 265-274.
3. **Campbell WE.** Behavior Problems in Dogs. pp. 256-270, BehaviorRx Systems, Grants Pass, 1999.
4. **Hsu Y, Severinghaus LL, Serpell JA.** Dog keeping in Taiwan: its contribution to the problem of free-roaming dogs. *J Appl Anim Welf Sci* 2003, **6**, 1-23.
5. **Kim KS, Jeong HW, Park CK, Ha JH.** Suitability of AFLP markers for the study of genetic relationships among Korean native dogs. *Genes Genet Syst* 2001, **76**, 243-250.
6. **Kim YK, Lee SS, Oh SI, Kim JS, Suh EH, Houpt KA, Lee HC, Lee HJ, Yeon SC.** Behavioral reactivity of Jindo dogs socialized at an early age compared with non-socialized dogs. *J Vet Med Sci* 2010, **72**, 405-410.
7. **Kim YK, Lee SS, Oh SI, Kim JS, Suh EH, Houpt KA, Lee HC, Lee HJ, Yeon SC.** Behavioural reactivity of the Korean

- native Jindo dog varies with coat colour. *Behav Processes* 2010, **84**, 568-572.
8. **Kim YM, Abd El-Aty AM, Hwang SH, Lee JH, Lee SM.** Risk factors of relinquishment regarding canine behavior problems in South Korea. *Berl Munch Tierarztl Wochenschr* 2009, **122**, 1-7.
 9. **Landsberg GM, Hunthausen WM, Ackerman L.** *Handbook of Behavior Problems of the Dog and Cat*. pp. 1-14, Saunders, New York, 2003.
 10. **Lee CG, Lee JI, Lee CY, Sun SS.** A review of the Jindo, Korean native dog. *Asian-Aust J Anim Sci* 2000, **13**, 381-389.
 11. **Lindsay SR.** *Handbook of Applied Dog Behavior and Training*. pp. 147-157, Iowa State University Press, Ames, 2001.
 12. **Mondelli F, Prato Previde E, Verga M, Levi D, Magistrelli S, Valsecchi P.** The bond that never developed: adoption and relinquishment of dogs in a rescue shelter. *J Appl Anim Welf Sci* 2004, **7**, 253-266.
 13. **Overall KL, Love M.** Dog bites to humans--demography, epidemiology, injury, and risk. *J Am Vet Med Assoc* 2001, **218**, 1923-1934.
 14. **Patronek GJ, Glickman LT, Beck AM, McCabe GP, Ecker C.** Risk factors for relinquishment of dogs to an animal shelter. *J Am Vet Med Assoc* 1996, **209**, 572-581.
 15. **Salman MD, Hutchison J, Ruch-Gallie R, Kogan L, New JC Jr, Kass PH, Scarlett JM.** Behavioral reasons for relinquishment of dogs and cats to 12 shelters. *J Appl Anim Welf Sci* 2000, **3**, 93-106.
 16. **Segurson SA, Serpell JA, Hart BL.** Evaluation of a behavioral assessment questionnaire for use in the characterization of behavioral problems of dogs relinquished to animal shelters. *J Am Vet Med Assoc* 2005, **227**, 1755-1761.
 17. **Wells DL.** A review of environmental enrichment for kenneled dogs, *Canis familiaris*. *Appl Anim Behav Sci* 2004, **85**, 307-317.
 18. **Wells DL, Hepper PG.** Prevalence of behaviour problems reported by owners of dogs purchased from an animal rescue shelter. *Appl Anim Behav Sci* 2000, **69**, 55-65.