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Short communication

Assessment of feline hospitalization environment using a one-way mirror

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Abstract

A separate, cat-specific hospitalization room away from dogs is recommended to reduce stress in cats; however, this can be difficult for some hospitals to provide. In such cases, measures are undertaken to reduce the cat's stress by providing a place to hide. However, inability to observe the cat's condition may be an obstacle to providing veterinary care. The use of a one-way mirror to create a sheltered environment while allowing observation of the cats was assessed. Five healthy cats were assessed using the Cat Stress Score (CSS) while in a cage with either a transparent panel or a one-way mirror. No significant differences in the CSS between the transparent panel and one-way mirror were observed. Variations in the CSS scores depended on the cat's personality, with friendlier and more sociable cats showing a lower CSS with the one-way mirror. A one-way mirror may be useful to reduce stress in hospitalized cats.

Keywords: Cat Stress Score, hospitalization, one-way mirror

Introduction

Hospitalization in an unfamiliar place can be stressful for cats. Methods to decrease stress by reducing visual stimuli, such as providing cardboard boxes (Buckley and Arrandale 2017) or towels (Arrandale and Buckley 2017) for hiding, are used in clinical settings. It is difficult for a cat to hide in a cardboard box if a Robert Jones bandage has been applied to a limb for stabilization after orthopedic surgery (Langley-Hobbs 2009), and covering the limb makes it difficult to assess postoperative swelling. Therefore, the use of cardboard boxes or towels may not be suitable for inpatient management.

In this study, we simulated an inpatient environment in which the movement of one hind limb was restricted by a Robert Jones bandage and examined the effect of the one-way mirror on stress in cats.

Materials and Methods

Five healthy laboratory cats (three neutered males, two spayed females) were used. Their average age was 4.6 years (4.0-7.0 years). The cats' personalities were surveyed by 28 laboratory members who were daily caretakers of the cats and were unaware of our research. The caretakers were asked to select more than one char-

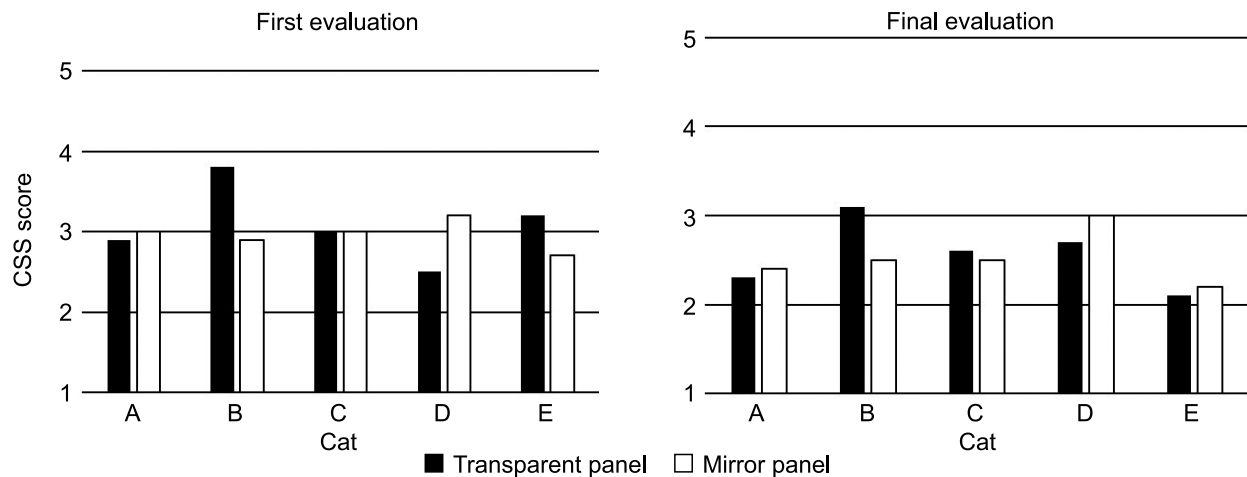


Fig. 1. Cat Stress Score results for each individual cat.

Black: Transparent panel; White: Mirror panel

Different cats had different Cat Stress Score (CSS) results for the panel.

Table 1. Cat characteristics.

Animals	Cat A	Cat B	Cat C	Cat D	Cat E	
Sex	castrated male	castrated male	castrated male	spayed female	spayed female	
Age	7 years	4 years	4 years	4 years	4 years	
Personality	1	curious	friendly	friendly	sociable	aggressive
	2	active	sociable	sociable	friendly	curious
	3	bad-tempered	curious	curious	timid	bad-tempered

acter trait from a list (Lee et al. 2007), and the top three traits for each cat were used to describe the cat's personality. The experimental environment was a new, unused cage. A transparent polyvinyl chloride plate (transparent panel) or a one-way mirror film (B08L7K1HWL, Koutou, Tokyo, Japan) with the same dimensions (mirror panel) were attached to the inside of the cage door. The upper one-fifth of the door remained open for ventilation. A light was fixed to the cage ceiling to brighten the inside of the cage. To simulate an inpatient environment, the environmental sounds of the intensive care unit at the University's Animal Medical Center were recorded and played during the experiment using audio speakers. Each cat was observed for one day while under transparent and mirrored panel conditions, with spacing and experimental days determined randomly. To eliminate the influence of circadian rhythms on behavioral change, observations were made from 17:00 to 18:00. In addition, we conducted the experiment with two cats concurrently: one with a transparent panel and the other with a mirrored panel. The room temperature was maintained at 24°C and humidity was not considered. To mimic the hospital environment, a Robert Jones bandage was applied to the right hind limb and an Elizabethan collar was placed on the cat imme-

diately before the start of the experiment. Two observers assessed the stress undergone by the cats using the Cat Stress Score (CSS) (Kessler and Turner 1997). Both observers had previously conducted a similar evaluation in another experiment and confirmed that there were no significant differences in the CSS results. The CSS of each cat was the average of the two observers' scores during the experiment. A 10-minute period was allowed for acclimation to the new environment, which was not included in the evaluation. After the acclimation period, Time 1 (10 to 25 minutes) and Time 2 (55 to 70 minutes) were evaluated. In addition to environmental sounds, we walked in front of the cage at 10-minute intervals and looked inside the cage at 20-minute intervals after the first 15 minutes of evaluation to simulate the actual inpatient environment. Student's *t*-test was used to compare differences between transparent and one-way mirror panels. Statistical significance was set at $p < 0.05$. Data were expressed as the mean \pm standard deviation. Ethics approval was obtained from the Ethics Committee of Nippon Veterinary and Life Science University (Reference number: 2021S-47).

Results and Discussion

No significant differences between the transparent panel and mirror panel were detected. In a previous study (Stoneburner et al. 2021), the average CSS value decreased every 60 minutes, suggesting that cats acclimatize to their environment. In this study, the CSS also decreased over time, suggesting that the cats did acclimatize to the experimental environment. The change in CSS for each individual cat was recorded (Fig. 1). For cats B and C, which had lower CSS scores than the other cats, the mirror panel blocked the exterior view making the entire cage a hiding place, thereby reducing stress similarly to hanging a towel over the front of the door. The environment created by the mirror panel may have led to a high CSS score in cats A and D owing to their personalities. Characterization of the cats' personalities, based on 12-character traits, is shown in Table 1. Cats A and D were categorized as sociable and curious; suggesting that isolation from people and inability to visualize outside the cage may have resulted in anxiety, which led to increased movement. It is also possible that the cats had no tolerance for their own reflection in the mirror, or that the mirror panel may have reflected a brighter glare compared with that by the transparent panel. Stoneburner et al. (2021) reported that the CSS was 4 or higher in their study and that the cats showed a preference for opaque cages. No cat in our study had a CSS of 4 or higher, which may explain why the mirror panel did not significantly lower the CSS. Cat E, being more aggressive and bad-tempered than the other cats, was initially afraid of the new environment and became still, possibly because it was unable to see its surroundings. This may have led to lower CSS values even

though the cat was stressed. Highly stressed cats may exhibit immobility and freezing (Rodan et al. 2011).

This study suggests that the use of mirror panels may effectively alleviate stress for some cat personalities, although further research is needed to fully determine which personality types benefit from the use of mirror panels and which do not. The use of one-way mirrors as an alternative management method to providing cardboard boxes and covering cage doors with towels may help reduce stress in hospitalized cats.

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