

Review Article

Mental stress of animal researchers and suggestions for relief

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ABSTRACT The use of animals heavily impacts the mental health of researchers performing the animal experiments. The animal researchers need to take care of animals but also give pain and sacrifice them at the same time. This circumstance can cause a variety of mental stress to the researchers. The stress generated in the laboratory would not only negatively affect the management of animals and the research results, but also would harm the researchers' physical and mental health. Because the feeling of sympathy for animals is a natural feature of humanity, psychological stress following a laboratory animal's death after use is not surprising. It is necessary to revise the relevant laws based on understanding the difficulties of animal researchers in society and to develop related educational programs at the national level to help the psychology and emotions of researchers who conduct animal experiments.

Keywords: animal ethics, animal experiment, euthanasia, laboratory animals, mental stress

INTRODUCTION

It has long been that a subject of ethical controversy and replacement alternatives are being widely discussed to avoid or replace the use of laboratory animals following Russel and Burch's concept of the 3Rs (replacement, reduction and refinement) (Russel and Burch, 1959). Despite growing public concern, and increasing availability and diversity of alternative scientific methods, animals continue to be used for scientific purposes for more than a century. Korea is not an exception, and the number of animals used for education and research purposes was noted to increase nationwide, from 2.4 to 3.7 million in 2014 and 2019, respectively (Ahn et al., 2021). Use of animals also heavily impacts the mental health of researchers

performing the animal experiments. According the previous report (Mo, 2016), the stress generated in the laboratory would not only negatively affect the management of animals and the research results, but also would harm the researchers' physical and mental health in Korea. It is also demonstrated that younger testers with less experienced and lower income exhibited higher anxiety scores than non-animal users (Kang et al., 2018). The animal researchers need to take care of animals but also give pain and sacrifice them at the same time. This circumstance can cause a variety of mental stress to the researchers. Because the feeling of sympathy for animals is a natural feature of humanity, psychological stress following a laboratory animal's death after use is not surprising. In this review, it will be pointed out the distinct features of

relationship between laboratory animals and the people managing them. In addition, psychological issues on animal researchers, not the laboratory animal itself, will be discussed.

THE DILEMMA OF ANIMAL RESEARCHERS AND FACILITY WORKERS

Animal researchers and other animal facility workers experience various types of interactions with laboratory animals in all stages of animal experiment, from purchase to termination, and experience various emotional changes in the process (Mo, 2016). Researchers who conduct animal experiments perform contradictory roles in managing and treating laboratory animals, while also inducing disease or even leading to death (Walshaw, 1994). In addition, regardless of the health condition of the animals, most of the experimental animals are killed when the research process is completed (Arluke, 1994). This is called 'caring-killing paradox' (Reeve et al., 2005). It was also reported that 11% of researchers in veterinary medicine and biology-related research institutes conducting animal experiments showed traumatic symptoms such as nightmares, emotional avoidance, and recollection after euthanasia of the animals (Rohlf and Bennett, 2005).

According to Dr. Mo's report (Mo, 2016), there are three typical examples that animal researchers may encounter: 1) Experiment with or euthanizing laboratory animals of similar species to companion animals at home, 2) In primate experiments, spending a lot of time with the animals in order to secure consistent results and a managing environment, 3) When the experiment is conducted for a long time, a strong attachment with the animal can be formed. The environment surrounding animal experimenters also provides a cause for those involved to easily fall into a dilemma. It can be divided into 4 categories as follows:

1) It is difficult to honestly discuss one's feelings toward a sacrificed animal with outsiders in the laboratory because of the possibility of negative social perceptions of animal experiments. As our society develops, activities pointing out the problems in animal experiments and the use of laboratory animals are increasing in Korea (Ahn et al., 2022). Therefore, more and more animal researchers sacrificing animals or animal facility workers who euthanize laboratory animals after use are also aware of unnecessary animal sacrifices resulting from animal ex-

periments and they are reluctant to talk about it with outsiders (Arluke, 1999).

2) It is difficult to share the sadness and discomfort felt after the death of an animal or a surgical procedure with colleagues in a laboratory conducting similar experiments. For researchers, sharing these difficulties with colleagues may feel like blaming colleagues who are doing the same tasks, or may express that they appear to be unsuitable for conducting the research, so it is difficult to share their difficulties easily. In general, researchers with long-term experience in animal experiments, such as the principal investigator and senior researcher, are well trained in looking at and analyzing laboratory animals as data, but junior researchers are less accustomed to dealing with animals as research objects, so the stress is more severe (Kang et al., 2018). This may result in quitting academic or occupational studies or changing majors and occupations due to inadequate adaptation to animal experiment in a laboratory where animal study is essential.

3) In many cases, the support system of institutions considering the safety for researchers is not sufficient. Although most institutions have the guidelines for the standard operation of animal facility and handling of laboratory animals and emphasize the laboratory safety, the methods and countermeasures for relieving the mental stress and anxiety of animal researchers and animal facility workers could not be found in animal experiment education or related literature in Korea (Mo, 2016).

4) Researchers may be confused about the moral status of animals. In general, although animals are 'experimental subjects' in laboratories, animal researchers can form bonds with laboratory animals. In addition, workers in animal facility take care of laboratory animals, promote their health and emotional stability, and at the same time perform euthanasia of animals essential for the completion of experiments or research results. Circumstances that lead to the death of the animal they cared for make ethical dilemma to them (Herzog, 2002).

LESSON FROM LIVESTOCK SLAUGHTER AND BURIAL

According to the report of National Human Rights Commission of Korea (NHRCK) (NHRCK, 2017), among the participants in livestock slaughter and burial, 76% of respondents showed post-traumatic stress disorder

symptoms such as memory avoidance, negative emotional state, anger outbursts, and sleep disturbance. In addition, 23.1% of respondents were severe depression state. Therefore, on January 4, 2019, the NHRCK issued a decision to the Minister of Agriculture, Food and Rural Affairs to encourage treatment, development of prevention manuals, and humane killing and disposition inspection for work participants, and to the Minister of Health and Welfare to establish a psychological support system through the National Trauma Center. Then, related ordinances were enacted for each local government. For example, Seoul Metropolitan Government Ordinance on 'Support for prevention and treatment of psychological trauma caused by livestock slaughter and burial, etc.' specifies governmental duties related to the prevention and support of psychological trauma for the participants of livestock slaughter and burial.

The report describing the caring-killing paradox (Reeve et al., 2005) indicate that perceived euthanasia-related strain is prevalent among shelter employees and is associated with increased levels of general job stress, work-to-family conflict, somatic complaints, and substance use as well as lower levels of job satisfaction. The analyses provide evidence that euthanasia-related work has a significant negative relation with employee well-being independent of its relation with generalized job stress. Exploratory analyses also suggest that individual, work, and organizational differences may influence the level of perceived stress and appear to be associated with certain aspects of employee well-being. The survey for Korean researchers also shows that over 48% of respondents got

stressed during the animal experiment procedures (Mo, 2016). Therefore, the participant of animal experiment should be treated the same as the participant of livestock slaughter and burial, at least similarly.

SUGGESTIONS

Here, we would like to propose to support animal researchers in the prevention and treatment of mental stress through two methods. First, we recommend each institution add the following items to the pre-education for animal experimentation which currently focusing on animal experiment procedures, experimental techniques, protocol writing and understanding of related laws, and others, in accordance with Table 1.

Next, by expanding or referring to the Ordinance on support caused by livestock slaughter and burial, the Act provides regulations or provisions for psychological and mental treatment induced by euthanasia of laboratory animals and abandoned dogs. For example, by stipulating matters regarding the scope of treatment subjects, designation of a dedicated medical institution, the procedure for treatment application, and the scope and procedure of cost support, the legal basis is established for the institution to support the medical expenses. In addition, it provides the basis for supporting the establishment of an organization to relieve the psychological damage of researchers or the development of related educational programs at the national level.

CONCLUSION

Stress generated in an animal laboratory will not only adversely affect animal care and experimental results, but also negatively affect the body and emotions of individuals. Therefore, it is necessary to revise the relevant laws based on understanding the difficulties of animal researchers in society and to develop related educational contents to help the psychology and emotions of researchers who conduct animal experiments. For this, policy support should be prepared in advance.

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Table 1. Items to consider adding to a curriculum for animal research or education

List of the items to add to the curriculum
1. Selection of animal species used according to research type
2. Providing examples of application of alternative methods for animal experiment
3. Considerations for researchers using higher animals (dogs, monkeys, etc.)
4. Consideration for researchers managing the same animal for a long time
5. Training for assistants or facility managers who support euthanasia or dissection
6. Guaranteeing students' right to veto animal experiment and providing alternatives

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