

“HANDLE WITH CARE”- IMPACT OF HANDS-ON WORKSHOP IN ANIMAL HANDLING AMONG RESEARCHERS OF DAKSHINA KANNADA DISTRICT IN SOUTH INDIA.

Navyashree R¹, Sridevi K¹, Roopa P Nayak²

¹Assistant Professor, Department of Pharmacology, Yenepoya Medical College, Derlakatte, Mangaluru, India.

²Professor and Head, Department of Pharmacology, Yenepoya Medical College, Derlakatte, Mangaluru, India

Received : 07/07/2023
Received in revised form : 31/08/2023
Accepted : 16/09/2023

Keywords:

Animal research, Pre-test, Educational intervention, Hands on training.

Corresponding Author:

Dr. Sridevi K,

Email: shettysri87@gmail.com.

DOI:10.47009/jamp.2023.5.5.87

Source of Support: Nil,

Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5(5); 443-447



Abstract

Background: The use of animals is an integral part of biomedical research. They are an essential component in medical research and have been crucial for providing pre-clinical knowledge during the initial phases of drug development. To assess the impact of hands on workshop in animal handling, we conducted a pre- and post-training evaluation survey through questionnaires. **Materials and Methods:** To train the researchers, one-day workshop was conducted on animal handling. The pre- and post-test results were analysed to identify the impact of the workshop. Participation was voluntary and there were no exclusion criteria. All participants took the same test questions. Participants of the workshop 45 researchers from a tertiary centre participated in the workshop. Learning outcomes were assessed by analysing questionnaires completed by the participants before and after the workshop. Wilcoxon Signed Rank Sum Test was used to determine statistical significance. **Results:** A total of 44 participants took part in the workshop. All the participants were from the biomedical sector. Pre and post-test questionnaires were used which were anonymous. Questionnaire had a total of 15 questions to be answered in both pre and post-test. 13 questions were multiple choices based, one question was open end question and the last question contained a scale to rate the knowledge, skill and confidence level in handling the animals before and after the study. The participants were asked to rate their level of confidence on a scale of 1 to 10 both during the pre and post-test. 65.7% of the participants rated their confidence level above 8 during the post test that shows a significant increase in the confidence in handling animals after the workshop. **Conclusion:** A brief educational intervention can influence further workshops targeted for postgraduate students and faculty members. After these hands on workshop it was significantly seen focused on staff performing basic animal care procedures in animal facilities across different faculties. As such, they were pleased to be seen as important enough to be given the opportunity to undertake this dedicated training.

INTRODUCTION

The mission of medicine is to eliminate suffering to maintain a good health, which may prolong the life. Drugs, an important tool in healthcare, are introduced in therapeutics after experimental evaluation. Since the beginning of humanity, the nature of human mind has led man to exploit his environment for his own requirements.^[1] Amidst endless efforts to expand his knowledge about living organisms, himself included, he began using animals for experimentation. Thousands of animals are used annually in educational institutes despite

efforts by concerned teachers and activists to reduce this number.^[2] Many medical schools in India and other countries have either introduced alternatives to these experiments or are deliberating on this contentious issue. The use of animals is an integral part of biomedical research. They are an essential component in medical research and have been crucial for providing pre-clinical knowledge during the initial phases of drug development. Proper knowledge and skill in handling laboratory animals are necessary for researchers conducting experiments on animals.^[1,2]

Humans have the privilege of conducting research using animals as their subject. Issues such as 'cruelty' to animals and the inhumane treatment of animals are valid concerns. Hence, the use of animals in experimentation is greatly regulated and requires adherence to international regulations and standards governing the humane care and use of laboratory animals. In India the regulatory authority for governing the experiments on animals is CCSEA - Committee for Control and Supervision of Experiments on Animals. CCSEA is a statutory body under the Ministry of Agriculture and Farmers Welfare, Department of Animal Husbandry Dairying and Fisheries (Animal Welfare Division), Government of India.^[3]

Research practices call for handling laboratory animals while conducting experiments. To ensure that research procedures are carried out efficiently, the researcher needs to be skilled in handling animals. The animals may develop anxiety, stress or sometimes become aggressive if the animals are not handled well. It has to be borne in mind that the animal might react by biting or attacking the researcher and injure him. Stress being an important confounding variable may lead to errors in the study results. In order to get accurate data skilled handling of animals is required.^[4]

Carstens and Moberg define stress in laboratory animals as "the biological responses an animal exhibits in an attempt to cope with threats to its homeostasis". Lab animals are stressed not only during experimental procedures, but also during transport from one place to another, from animal house to lab area, while handling by the researcher, changes in the external environment, housing etc.^[5]

Proper restraint and handling techniques are an essential part of experimentation with animals. This decreases stress in animals and increases the confidence of the researcher. This requires learning the correct techniques and constant practice,^[6,7] In view of providing proper knowledge and skills to the researchers, a one-day training programme emphasising the guidelines, basics of animal handling and care, alternatives to animals in research, and functioning of the Institutional Animal Ethics Committee (IAEC) was organised.

To evaluate the effect of the training programme, a questionnaire was developed. Participants answered the questionnaire before and after the conduct of the workshop. Hence this study aims to evaluate the impact of hands-on training in animal handling among researchers of Dakshina Kannada district in South India.

MATERIALS AND METHODS

To train the researchers a one-day workshop was conducted on animal handling. The pre- and post-test results were analysed to identify the impact of the workshop. Participation was voluntary and there

were no exclusion criteria. All participants took the same test questions.

Participants of the workshop 45 researchers from a tertiary centre participated in the workshop.

Questionnaire

A self-structured, anonymous questionnaire was used before and after the intervention to understand the knowledge, attitude and practice regarding animal handling among the researchers and to evaluate the impact of the workshop. The questionnaire included questions on knowledge and attitude towards animal handling, Ethical issues involved in experimentation with animals. Questions related to practices were given with answers as scales. The questionnaire had both multiple choice or to fill in a descriptive field. All questionnaires were anonymous to protect personal data of the participants. The participants were given 15 minutes to complete the questionnaires

Workshop design

A one-day workshop titled "Basic Concepts of Animal Experiments & Ethics" was planned after clearance from the Institutional Animal ethics Committee. It was coordinated and held by the Department of Pharmacology along with external faculty trained in animal handling and Ethics. During the intervention, PowerPoint slide presentations, including text, pictures and videos, were complemented by interactive workshop techniques where safe handling of animals were demonstrated. Topics covered were CCSEA guidelines for animal experiments, basic concepts of animal studies & different animal models and alternatives to animal experiments, Role & Functions of Institutional Animal Ethics Committee and Demonstrations and Hands on training on animal handling. To ensure the workshop was meeting its objectives, a questionnaire was administered before and after the session.

Data analysis

Answers of the open-ended questions were analysed descriptively. Microsoft Excel was used to analyse this data. First 13 questions were analysed using Wilcoxon signed rank Test and question number 14 and 15 were analysed using percentage. Wilcoxon signed rank test showed posttest values to be highly significant. SPSS software version 27 was used to analyse the data.

RESULTS

A total of 44 participants took part in the workshop. All the participants were from the biomedical sector. Pre and post-test questionnaires were used which were anonymous. Questionnaire had a total of 15 questions to be answered in both pre and post-test. 13 questions were multiple choices based, one question was open end question and the last question contained a scale to rate the knowledge, skill and confidence level in handling the animals before and after the study. We did not collect any

demographic data from the participants since our goal was only to analyse the learning during the workshop. All the questions were attempted in the pre and post-test. Questions 1 to 13, 37 participants to on the post-test. Total post-test correct responses were highly significant ($P < 0.001$) compared to pre-test responses [Table 1].

As per table 2 the pre-and post-workshop opinions of three participants changed significantly. Opinions were tested on the scale of 1-10 in pre-test and post-test. As seen, participant's opinion has been significantly increased in all questions ($p < 0.05$), the pre-test score are low but post-test scores raised significantly which further suggest the importance of hands-on training [Table 2].

As per table 4 the knowledge and skills were tested on the scale of 1-10 in pre-test and post-test. As seen, participant's both knowledge and skills have been significantly increased in all questions ($p < 0.05$), the pre-test score are low but post-test scores raised significantly which further suggest the importance of hands-on training [Table 3].

showed improvement in the post test questionnaire by the participants. The proportion of participants who scored correct answers increased from on the pre-test

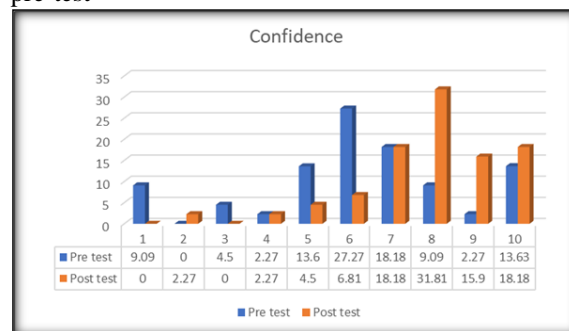


Figure 1: Confidence levels comparison of participants in Pre-test and Post-test

As per figure 1 the participants were asked to rate their level of confidence on a scale of 1 to 10 both during the pre and post-test. 65.7% of the participants rated their confidence level above 8 during the post test that shows a significant increase in the confidence in handling animals after the workshop.

Table 1: Pre-Test and Post-Test scores of participants

Question number	Percentage of correct answers	
	Pre test	Post test
1. What does CCSEA stands for?	79.5	93.18
2. The composition of IAEC (Institutional Animal Ethics Committee) should consist of all except	72.72	75
3. All the statements regarding the quorum requirements for IAEC meetings are true except	43.18	61.36
4. In conducting experiments on animals, regard shall be had to the following conditions except:	65.9	86.36
5. What are 5Rs in Animal Experimentation?	25	68.18
6. The agents used for vasodilation during blood withdrawal from tail of rodent	13.6	63.63
7. The length of the oral feeding tube in rodents is estimated by	18.18	68.18
8. The minimum number of animal per group to be taken, to achieve statistical significance is	34.09	86.36
9. Form D is maintained by	79.5	88.6
10. Euthanasia means	29.5	90.9
11. CNS activities have to be performed in the following conditions except	47.71	52.27
12. Elevated plus maze is screening method for	59.09	72.72
13. The following screening methods are used for assessing analgesic activity except	9.09	68.18

Table 2: Opinions of participants towards workshop

Questions	Opinion		p-value
	Pre-test	Post-test	
1	2	8	0.02
2	1	9	0.01
3	1	8	0.02
4	2	9	0.03
5	2	8	0.01
6	1	9	0.03
7	2	9	0.01
8	2	8	0.02
9	2	8	0.01
10	3	9	0.01
11	2	8	0.01
12	1	8	0.02
13	2	9	0.01
14	2	8	0.02

Table 3: Improvement in Knowledge and Skills in participants as per Pre and Post test

Questions	Knowledge		Skills		p-value
	Pre-test score	Post-test score	Pre-test score	Post-test score	
1	2	9	2	9	0.01
2	1	9	2	8	0.01
3	1	9	2	10	0.01
4	2	9	2	9	0.01
5	3	8	2	9	0.01
6	3	9	2	8	0.01
7	2	9	1	10	0.01
8	2	8	1	9	0.01
9	3	9	1	9	0.01
10	3	9	1	8	0.01
11	2	9	1	9	0.01
12	1	8	3	9	0.02
13	1	9	3	8	0.01
14	1	9	2	9	0.02

DISCUSSION

Our comprehension of the course impact and effectiveness depended heavily on participant evaluation of the workshop design. All participants found that it met their expectations and that its content satisfied them, which is consistent with the findings of Carlsson et al,^[8] von Roten,^[9] and Franco and Olsson¹⁰. The majority of participants expressed satisfaction with the workshop material and the materials made available by the organizers. Participants in this workshop anticipated gaining a better understanding of and ability to put these principles into practice when caring for and using animals in scientific research. These are crucial elements to assist standardize experimental data, enhance any advantages derived from using laboratory animals, and improve the quality of research.

At the beginning of the session, a surprisingly large number of researchers were unaware of CCSEA guidelines. However, with workshop appear to be effective in overturning this situation, with almost every participant being able to increase the knowledge and skills. The post-test assessment matched the level of awareness shown in a survey of licence holders in the UK,^[10] Furthermore, results from researchers' self-evaluation showed that they perceive the workshop to have a relevant positive impact on both their knowledge and awareness of animal welfare issues, as well as in the implementation in their work with animals.

The workshop was created to support the participants' free expression of ideas while fostering collaboration and active participation. The majority of participants noted that the training layout encouraged them to study while also enabling them to collaborate well in groups and participate in class discussions. This encouraging reply demonstrated the value of the workshop for the ongoing professional growth of staff members involved in animal handling across a variety of professions.^[11]

A key goal of the workshop is to increase students' knowledge and skills related to the idea of animal welfare in the setting of experimental animals. This goal fits with Holmberg's statement that "learning

good handling is a means of doing good research."^[12] Additionally, all participants (100%) gave excellent feedback on how successfully the Three Rs principles were covered during the training. As a result, implementing the Three Rs as a result of taking this workshop would lead to a decrease in the number of animals utilized, as well as an improvement in laboratory animal practices. As a result, there is a clear need for workshop organizers and instructors to further promote understanding of humane treatment.

Overall, the participants reaffirmed the significance of submitting a project application in order to get ethical approval for the use of animals in their study before conducting the experiments, in accordance with international standards and policies. This is consistent with earlier research findings,^[13,14] Each participant admitted to having at least one ethical question about their work with animals. In terms of ethics, previous studies have demonstrated that scientists typically give more weight to the overall degree of animal suffering than the precise number of animals that suffer.^[15]

An important portion of the workshop involved hands-on learning. Faculty gave demonstrations of animal handling and blood withdrawing techniques to the workshop participants. After practical training sessions it was made sure they had reached an appropriate level. Additionally, after the hands-on instruction, all participants said that their understanding of the various cages and housing needs for experimental animals had improved. All participants agreed that the proper procedures of euthanasia for each animal species were well taught. Major limitation of our study was anonymous questionnaires were used; hence the demographics of the participants could not be captured.

CONCLUSION

The general assessment of the workshop revealed a positive picture. All participants were in favor of the workshop. After these hands on workshop it was significantly seen focused on staff performing basic animal care procedures in animal facilities across

different faculties. They were pleased to be given the opportunity to undertake this dedicated training.

Conflict of Interest- None declared.

Acknowledgement: We would like to thank Dr. Megha Rani N, Associate Professor, Department of Pharmacology, Yenepoya Medical College for her immense support and guidance

REFERENCES

1. National Research Council (US) and Institute of Medicine (US) Committee on the Use of Laboratory Animals in Biomedical and Behavioral Research. *Use of Laboratory Animals in Biomedical and Behavioral Research*. Washington (DC): National Academies Press (US); 1988. 3, Benefits Derived from the Use of Animals.
2. Badyal DK, Desai C. Animal use in pharmacology education and research: the changing scenario. *Indian J Pharmacol*. 2014;46(3):257-265.
3. CPCSEA website - Committee for the purpose of control and supervision of experiments on animals (CPCSEA) [Last accessed on]. Available from: <http://moef.nic.in/modules/divisions/cpcsea>.
4. Assessment of trainee's knowledge and practice behavior changes with the revised medication management service training program in Singapore General Hospital outpatient pharmacy. GiatYengKhee, Jia Yuan Tay, SeiKengKoh, Melissa Mee Yin Chow, Wan Chee Ong and Paik Shia Lim, Department of Pharmacy, Singapore General Hospital, Singapore. Published online: 3 January, TAPS 2017, 2(1), 16-20
5. O'Malley CI, Hubley R, Moody C, Turner PV. Use of non-aversive handling and training procedures for laboratory mice and rats: Attitudes of American and Canadian laboratory animal professionals. *Front Vet Sci*. 2022;9:1040572. Published 2022 Dec 9.
6. Aidaros H. Global perspectives — the middle east: Egypt. *Rev Sci Tech Off IntEpiz* 2015; 24: 589–596.
7. Balls M, Goldberg AM, Fentem JH, et al. Three Rs: the way forward: the report and recommendations of ECVAM Workshop 11. *Altern Lab Anim* 2015; 23: 838–866.
8. Carlsson HE, Hagelin J, Höglund AU, et al. Undergraduate and postgraduate student's responses to mandatory courses (FELASA Category C) in laboratory animal science. *Lab Anim* 2011; 35: 188–193.
9. Von Roten FC. Laboratory animal science course in Switzerland: participants' points of view and implications for organizers. *Lab Anim* 2018; 52: 69–78.
10. Franco NH, Olsson IAS. Scientists and the 3Rs: attitudes to animal use in biomedical research and the effect mandatory training in laboratory animal science. *Lab Anim* 2013; 48: 50–60.
11. Ralph BD, Steve H, Rajasekhar R. Sample size determination. *ILAR J* 2012; 43: 207–213.
12. Holmberg T. A feeling for the animal: on becoming an experimentalist. *SocAnim* 2018; 16: 316–335.
13. Lund TB, Lassen J, Sandøe P. Public attitude formation regarding animal research. *Anthrozoos* 2012; 25: 475–490.
14. Lund TB, Mørkbak MR, Lassen J, et al. Painful dilemmas: a study of the way the public's assessment of animal research balances costs to animals against human benefits. *Public UnderstSci* 2012; 23: 428–444.
15. Ormandy EH, Schuppli CA. Public attitudes toward animal research: a review. *Animals* 2014; 4: 391–408.