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A STUDY OF SCIENTIFIC PERCEPTION ON THE UTILIZATION OF ANIMALS IN LABORATORIES AND RESEARCH

DHUHA JAWAD MAHDI

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ABSTRACT

This research was carried out to identify the factors that may influence humans' choice on whether to bolster or revoke the utilization of animals in laboratories and research. This study was focused to determine the views of people with science background. A total of 351 respondents from 1236 research population with different academic levels consisting of students who are pursuing their studies in one of the programmes offered at the Faculty of Science and Mathematics, lecturers and laboratory assistant. Two instruments used for this study in order to answer the research questions were the survey questionnaire and the interview protocols. Data were statistically analysed using ANOVA and t-test. Results showed various factors; such as gender, age, academic level and position, influence the utilization of animals in laboratories and research. Female gender was found more concern about animal testing compared with male, whilst higher academic level shows better knowledge in the alternative methods for animal testing. The outcomes propose that animal applications in laboratories and research are adequate, given that animal welfare are thought about and under adequate control. More prominent exertion may likewise be required to educate students and people in general about logical practice using animals in laboratories and research, as well as to allow criticism by means of open engagement, to lessen the holes between basic logical practices and moral qualities.

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SATU KAJIAN MENGENAI PERSEPSI SAINTIFIK TERHADAP PENGGUNAAN HAIWAN DALAM MAKMAL DAN PENYELIDIKAN

ABSTRAK

Kajian ini dijalankan untuk mengenal pasti faktor-faktor yang mempengaruhi pilihan manusia sama ada untuk meningkatkan atau mengelakkan penggunaan haiwan dalam makmal dan penyelidikan. Kajian ini memberi fokus kepada pandangan responden yang mempunyai latar sains. Sejumlah 351 responden daripada 1236 populasi kajian dengan tahap akademik yang berbeza, terdiri daripada pelajar yang mengikuti pengajian di salah satu program yang ditawarkan di Fakulti Sains dan Matematik, pensyarah dan pembantu makmal. Dua instrumen yang digunakan ialah soal selidik dan protokol temubual. Data dianalisis secara statistik menggunakan ujian-t dan ANOVA. Keputusan menunjukkan jantina, umur, tahap akademik dan jawatan mempengaruhi penggunaan haiwan dalam makmal dan penyelidikan. Wanita didapati lebih prihatin terhadap ujian menggunakan haiwan berbanding lelaki, sementara tahap akademik yang lebih tinggi menunjukkan pengetahuan yang lebih baik dalam kaedah alternatif untuk ujian menggunakan haiwan. Kesimpulannya penggunaan haiwan dalam makmal dan penyelidikan adalah memuaskan dengan mengambilkira kebajikan haiwan tersebut dan berada di bawah kawalan yang rapi. Implikasinya, usaha yang lebih giat diperlukan untuk mendidik pelajar dan orang ramai secara amnya tentang amalan baik dalam penggunaan haiwan dalam makmal dan kajian, serta membenarkan kritikan melalui perbincangan terbuka untuk mengurangkan jurang antara amalan yang sering dilakukan dan kualiti moral.

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LIST OF ABBREVIATIONS

3RS	Reduction, Refinement, and Replacement
A	Agree
A1	Age group 1
A2	Age group 2
AA	Animals Act
AAALAC	Association for Assessment and Accreditation of Laboratory Animal Care International
AALAS	American Association for Laboratory Animal Science
AEC	Animal Ethics Committee
ANOVA	Analysis of variance
AVMA	American Veterinary Medical Association
AWA	Animal Welfare Act
CADD	Computer Aided Drug Design
CBRA	California Biomedical Research Association
CT	Computed Tomography
D	Disagree
DNA	Deoxyribonucleic Acid
EUPASP	EU Directive on the Protection of Animals used for Scientific Purposes
H	Hypothesis
HIV	Human Immunodeficiency Virus
HSUS	Humane Society of the United States

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IACUC	Institutional Animal Care and Use Committee
IACUCs	Institutional Animal Care and Use Committees
ILAR-NRC	Institute for Laboratory Animal Research
IMR	Institute for Medical Research
KL	Kuala Lumpur
LASAM	Laboratory Animal Science Association of Malaysia
LD50	Lethal Dose 50
MNAWF	Malaysian National Animal Welfare Foundation
MRIs	Magnetic Resonance Imaging
N	Neutral
NEAVS	New England Anti-Vivisection Society
NIH	National Institutes of Health
NRC	National Research Council
OSHA	Occupational Safety and Health Administration
PC	Personal Computer
PhD	Doctor of Philosophy
PHS	Public Health Service
PNAS	Proceedings of the National Academy of Sciences
QSAR	Quantitative Structure Activity Relationship
R1	Lecturer Respondent
R10	Diploma Student Respondent
R2, R3	Lab Assistance Respondent
R4, R5	PhD Student Respondent
R6, R7	Master Student Respondent
R8, R9	Degree Student Respondent

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RM	Ringgit Malaysia
RQ	Research Question
SA	Strongly Agree
SARs	Structure Activity Relationship
SD	Strongly Disagree
SPCA	Selangor Society for the Prevention of Cruelty to Animals
SPSS	Statistical Package for the Social Sciences
SSPCA	Sarawak Society for the Prevention of Cruelty to Animals
Tukey HSD	Tukey Honestly Significant Difference
UAR	Understanding Animal Research
UFAW	Universities Federation for animal well-charges
UK	United Kingdom
UPM	Universiti Putra Malaysia
UPSI	Universiti Pendidikan Sultan Idris
US	United State
USDA	United States Department of Agriculture
USFDA	US Food and Drug Administration
USNIH	US National Institutes of Health

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APPENDIX LIST

A Survey questionnaire on the utilization of animals for scientific purposes

B Interview Questions Regarding Animal Testing

C Reliability statistics

D Validation of instrument

E Sample of consent form

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CHAPTER 1

INTRODUCTION

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1.1 Introduction

The utilization of animals in scientific research remains an imperative device in enhancing our comprehension of how organic materials function in both wellbeing and illnesses. Such utilize is significant for the advancement of new medications and front line medicinal advances for both people and animals, and for the assurance of our surroundings. Subsequently, empowering appropriately controlled utilization of animals is basic to enhancing the wellbeing and lives of people and animals and to the security and the ability to maintain our surroundings. For instance, the advancement of monoclonal immune response treatments in the course of the most recent 20 years has totally changed our capacity to treat ailments including breast and other cancers, rheumatoid joint inflammation and numerous sclerosis (Lehmann et al., 2009).

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1.2 Background of Research

The scientific basic for developing new methods to deal with innovative work is extremely solid. Numerous potential medications bomb because of the absence of adequacy in people or worries about their security. Also, there are worries about the utilization of animal studies for testing natural chemicals. Current animal right movements have revealed a higher measurement in excessive amount of animal usage in research and laboratories. This issue has become an endless argument between the scientists and the involved parties.

1.2.1 Attitudes Toward The Utilization of Animal Testing

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There are a few calculates past literary works that show to impact individuals' dispositions towards animals, and animal based research particularly. These incorporate the individual and social attributes, animal qualities, and research qualities (Knight and Barnett, 2008). By investigating these persuasive figures's detail, the accompanying audit gives a report on the overview based open disposition writing that was looked into 10 years back by Hagelin et al. (2003).

The case is often made that the public do not have enough background knowledge to be involved in discussions or engagement exercises about animal research, the so-called deficit or 'Enlightenment' model (Elam & Bertilsson, 2003). Whilst having some support in studies that show a relationship between familiarity with science and support for animal research (Broida et al., 1993; Pifer et al., 1994; Pifer,

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1996; Schuppli & Weary, 2010; Crettaz, 2013), the deficit model has nevertheless been widely criticized. Indeed, one study has shown that as knowledge increases members of the public may become less supportive, particularly if the topic under discussion is considered morally contentious (Evans & Durant, 1995). Other studies have echoed this and found that in some cases familiarity with animal research was associated with lower levels of support (Broida et al., 1993; Pifer et al., 1994; Knight et al., 2003; Ormandy et al., 2013).

Furthermore, some authors proposed that science and society cannot feasibly be separated, and have called for the democratization of scientific practice (Irwin, 2001; Elam & Bertilsson, 2003; Jasanoff, 2006). Since there are shifts toward the democratization of science (Schiele, 2008) it becomes increasingly important to understand public attitudes toward scientific practices that invoke polarized opinion or might be considered morally contentious, such as animal research, and to develop novel mechanisms for public engagement on such issues.

The term ‘attitude’ has been used to refer to “the evaluation of an object, concept, or behavior along a dimension of favour or disfavour, good or bad, like or dislike” (Ajzen & Fishbein, 2000). Attitudes are distinct from, but related to, people’s beliefs and values. It is postulated in the expectancy-value model (Fishbein, 1963; Fishbein, 1967) that attitudes are formed through a person’s accessible beliefs about an object, where a belief is defined as “the subjective probability that the object has a certain attribute” (Ajzen & Fishbein, 2000). Azjen & Fishbein (2000) (p. 4) give an illustrative example: “a person may believe that exercise (the attitude object) reduces the risk of heart disease (the attribute).” An imperative ramifications of the anticipation

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esteem model is that states of mind towards a protest are framed naturally and unavoidably as we get new (and relevant) data around a question's traits, and as the subjective estimations of these credits get to be distinctly connected to the question.

In this manner, surveying individuals' states of mind towards animal research can educate us all the more concerning whether diverse sorts of animal research are normatively viewed as "great" or "terrible" at both an individual and societal level. Thus, this study focused on understanding the factors, practices and also the contribution of alternative methods that influence the people who directly involved in the utilization of animals in laboratories and research.

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1.2.2 The Continuing Needs to Use Animals in Research

It is clear that there is a continuing need for properly regulated and ethically conducted research-using animals where the harm caused to the animals is justified by the potential benefits, and where no practicable alternative exists. Despite the fact that it isn't right to superfluously mishandle animals, animal experimentation must proceed with on account of the tremendous logical asset that animal models give (Liou, 2010).

Animals are proper research subjects since they are like individuals from numerous points of view. Chimpanzees impart 99% of their DNA to people, and mice are 98% hereditarily like people (CBRA, 2013). All warm blooded animals, including people, are plunged from basic predecessors, and all have a similar arrangement of organs (heart, kidneys, lungs, and so forth.) that capacity in basically a similar route

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with the assistance of a circulation system and focal sensory system (UAR, 2014). Because animals and people are so naturally comparable, they are helpless to a hefty portion of similar conditions and ailments, including coronary illness, growth, and diabetes (David et al., 2012).

Animal research is astoundingly overseen, with laws set up to shield animals from mishandle. Despite neighborhood and state laws and guidelines, animal ask about has been controlled by the administration Animal Welfare Act (AWA) since 1966. And additionally stipulating least lodging models for research animals (fenced in area measure, temperature, access to clean nourishment and water, and others), the AWA likewise requires general reviews by veterinarians (AWA, 2008). All recommendations to utilize animals for research must be affirmed by an Institutional Animal Care and Use Committee (IACUC) set up by every exploration office. Compassionate treatment is authorized by every office's IACUC, and most significant research establishments' projects are willfully audited for sympathetic practices by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC) (AMP, 2016). All foundations getting subsidizing from the US Public Health Service (PHS) must agree to the PHS Policy on Humane Care and Use of Laboratory Animals (Society of Toxicology, 2006; AWA, 2008; USDA, 2010).

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1.3 Problem Statement

The utilization of animals in research raises various opinions and attitudes. Some people articulate the desire for complete abolition of animal research practices, while

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others express strong support it (Hagelin et al., 2003). In any case, as Knight et al. (2009) call attention to, the crucial contentions used to contradict or bolster animal look into have moved minimal after some time: regularly, the individuals who restrict animal investigate tend to concentrate on animal welfare and the misery of the animals included, though the individuals who are included in research (e.g., researchers, analysts) tend to construct their contentions in light of the advantages of their work and the absence of contrasting options to animal models (Baldwin, 1993; Paul, 1995). They also agree that it is wrong to use animals if alternative-testing methods would produce equally valid results.

Many teaching and research laboratories make use of non-human animals as test subjects. Animals may be subjected to experimentation or modified into conditions useful for gaining knowledge about human disease or for testing potential human treatments. Even though animals such as mice and rats are distant from humans, they share many physiological and genetic similarities with humans. Thus, animal experimentation can be tremendously helpful as at pre-university biology laboratories as well as for furthering medical sciences or any related biomedical fields.

There is often no discrepancy made between the diversity of animal use in laboratories and research in the previous years. There appears to be an underlying assumption that people's attitudes are uni-dimensional (Knight & Barnett, 2008). Typically, studies of public attitude involve the use of survey style methods; however, a few reviews don't unveil all the methodological subtle elements of the study (Herzog et al., 2001), and now and again the inquiries that make up these studies are worded in one-sided ways, hence trading off the estimation of the outcomes. Thus, it is high time

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to view the insight of people who directly involved in the utilization of animals in the laboratories and research, to seek the current practices carried out and to identify any alternative methods to animal testing. The administration of animals before, during and after experimentation should be looked into in order to monitor the fate of tested animals.

1.4 Theoretical Framework

At the heart of the debate about the ethics of animal experimentation lies the question of the moral relationship between humans and non-humans. Western philosophers over the centuries have regarded humans in a different light to the rest of the animal kingdom. For example, Aristotle believed that there was a hierarchy of animals, with humans at the top, as humans could reason and had “rational souls” (Foëx, 2007).

Indeed, even inside people there was a chain of command: men were more discerning than ladies. This made it flawlessly satisfactory to oppress "savages". Descartes considered that non‐humans were insentient "machines". All things considered, they could feel no agony, thus could be abused savagely. Then again, acknowledged that animals could endure, in any case, by lacking good self-sufficiency, they likewise needed good status (Foëx, 2007).

Three main elements with regard the human attitude towards animal testing or experimentation include the behavior change model (Prochaska et al., 1992), the moral status (theory) and moral actions to use animals are discussed below.

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