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The ethics of animal research: A survey of the public in Saudi Arabia

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ABSTRACT

Background: In the extent of medical evolution and research we aimed to consider the ethics of using animal in research, drug therapy trials and experimental procedures, we wanted to explore the opinion of the public in Saudi Arabia towards it. *Methods:* a survey was established from January 2022 to August 2022 in Google form and was distributed by the internet and social media to the public of Saudi Arabia. Consent was essential and participation was voluntary. *Results:* Around 414 people from the public responded to the survey completely, 56% of them were female and 44% were male. Around 77% of them were aged between 18 to 24 years old. 45% were studying in health care universities especially medical, pharmacy, nursing, and dental colleges. 77% were from the western province of Saudi Arabia. More than half of the participants argued positively about the need of using animals in research and the wide benefits of it for humanity especially for experiment on very serious health conditions for humans. However, around 30% felt that there can be an alternative for animals for such situation. *Conclusion:* More debate is vital to be established with a greater number of public participation and interviewing for a possible convincing method for collecting rationale opinions.

Keywords: animal, research, ethics, public, Saudi Arabia.

1. INTRODUCTION

The relation between the human and animal tissue is known to be closely intertwined. From this principle, the use of the animal model in a study of human anatomy and physiology has been widely used in experimental research to increase human knowledge and answer biogenic and biomedical questions (Alves & daSilva, 2018). Hence, the animal has provided a marked contribution to ancient and modern understanding. Millennia of years ago, in the 12th century a novel surgical technique: tracheostomy performed in goats by Ibn Zuhr, also in the 1900s laparoscopy was initially performed in dogs by Georg Kellings. In the same concept, in the early 1930s, Albert Sabin used

monkeys to develop the polio vaccine, also in the 1920s by using canines the insulin was discovered, based on this discovery was approved of diabetes research relied on the genetically modified mouse and rat model (Robinson et al., 2019).

Nowadays, animal models are used to develop new therapies and also used as drug testing systems to predict safety and efficacy in humans, in which the most common animal used is the mouse (Osum et al., 2021). Specifically, mice and ferrets are most animal models used in the study of human influenza and other animals including cotton rats, tree shrews, and Syrian hamsters, because these animals have α2,6 linked Neu5Ac in the upper respiratory tract like humans, so these animals are much preferred than others (Wang et al., 2021). Zebra fish have become used to tasting and evaluating new drugs and to understanding pathogenesis for fibrotic disease (Coulter-Parkhill et al., 2021). Also, the venoms of animals can be used to discover new drugs, venoms are now being recognized as a potential tool in medicine including many clinical approved venom-derived drugs such as the use of bee venom therapy of *apis mellifera* speciose as the whole venom to treat osteoarthritis and use cobratoxin drug of Chinese cobra *naja naja atra* species to treat pain and use of batroxobin drug of Brazilian lancehead snake *bothrops moojeni* species to treat stroke and ischemic attack (Spruit et al., 2021; Ferreira et al., 2019).

However, public in general might have an argument about the use of animals in research and discuss about the ethical parts of it. Therefore, we aimed to direct this survey into large number of public to search in depth their opinion and idea about the use of animal in research and experimental topics.

2. METHODS

Study design

The present study is a web-based descriptive cross-sectional study from January 2022 to August 2022. Data was obtained through an online questionnaire directed to the public in Saudi Arabia.

Study Population

Our target population will be public individuals in Saudi Arabia

Inclusion Criteria

Age 18 years and above; Living in Saudi Arabia; both genders.

Exclusion Criteria

Researchers; Any mental disorder subjects

Study procedures

We aimed to have a questionnaire that is simple, succinct, and easy to understand by the public. Items were selected based on the literature review. An online English and Arabic questionnaire will be designed using Google forms. Respondents will receive electronic links accompanied by the objectives of the survey, the target population, and a request to participate voluntarily. The research got the approval of the UQU institutional research board number (HAPO-02-K-012-2022-02-944) and was distributed electronically via social media apps to all the public eligible for the inclusion criteria.

Data collection and management

Data was collected through an online Google form which was distributed electronically in the English and Arabic language to the targeted population. The questionnaire contained the following sections:

1- Consent form

2- Sociodemographic data

3- Questions about “Benefits Arguments” to morally justify animal research.

4- Questions about “Characteristics of non-human-animals arguments” to morally justify animal research.

5- Questions about “alternative method”.

6- Other question.

A combined system of codes, numbers, and pseudonyms was set up to ensure the confidentiality of participants' information.

Sample size determination

The minimum sample size required for this study was calculated by OpenEpi version 3.0. In consideration of the following: the population size of individuals who lives in Saudi Arabia is about 34.81 million (according to General Authority for Statistics), keeping the confidence interval (CI) level at 95% and considering Anticipated % of frequency as 50% and taking design effect as 1. The sample size was calculated to be 384 participants.

Statistical Analysis Plan

For data analysis, SPSS version 23 (USA) was used. We used descriptive statistics for summarizing the data, synthesizing, and reporting all variables. Moreover, data presented as mean ± SD, or as median. For categorical variables, percentages and frequencies was be used. Comparison between groups was made by Student's t-test or Mann Whitney test and Chi-squared test was used to obtain for the association between categorical variables. P-value was considered significant if it was less than 0.05 and the Confidence interval (CI) was set at 95%.

3. RESULTS

Table 1 demonstrates the basic characteristics of the respondents of the study. They were 414 subjects. 77% were aged from 18 to 24 years old, 3.6% were from 25 to 34 years old, 5.3% were from 35 to 44 years old, 13.7% were from 45 to 54 years old and 0.4% were 54 years and older. Around 44% were male and 56% were female. 25 % were from high school graduates, 45 % studying at universities and 5% were undergraduates. Around 86% were related to the medical field. 77% of the subjects were from the west part of Saudi Arabia, 1.2% from the eastern province, 0.5% from the capital, 0.8% from the southern and 12% from the Northern Province.

Table 1 Basic Characteristics of the respondents.

Description	(n=414)
Age	
18-24yr	318(77%)
25-34yr	15(3.6%)
35-44yr	22(5.3%)
45-54yr	57 (13.7%)
>54yr	2 (0.4%)
Sex	
Male	182(44%)
Female	232 (56%)
Education Level	
High school graduate	103 (25%)
Some College/University	186 (45%)
University graduate	21 (5%)
None of above	104 (21%)
Work in Medical Field	
No	75(18%)
Yes	339 (86%)
Area of Residence	
Western Province	320 (77%)
Eastern Province	5 (1.2%)
Middle Capital	2 (0.5%)
Southern Province	3(0.8%)
Northern Province	48 (12%)

Figure 1 elucidates the argument about the question "do you think animal experiments benefit humans to a great extent? Around 77% said yes and 22% said no. Figure 2 was expressing the argument "Is there a benefit to humans from conducting animal experiment? " Around 68% said yes and 32% said no. Figure 3 were arguing about" Should animal be used in experiments only for serious diseases that threaten human life: around 88% said yes and the 12% were no.

Figure 4 showed the argument about "Do you think animals feel nothing?" and around 18% said no that they do not feel anything and the 82% said yes, the animals have feelings. Figure 5 demonstrates the argument about "Is it possible that animal testing will become unnecessary anymore?" around 32% said yes to this and 68% said no alternatives were to be found.

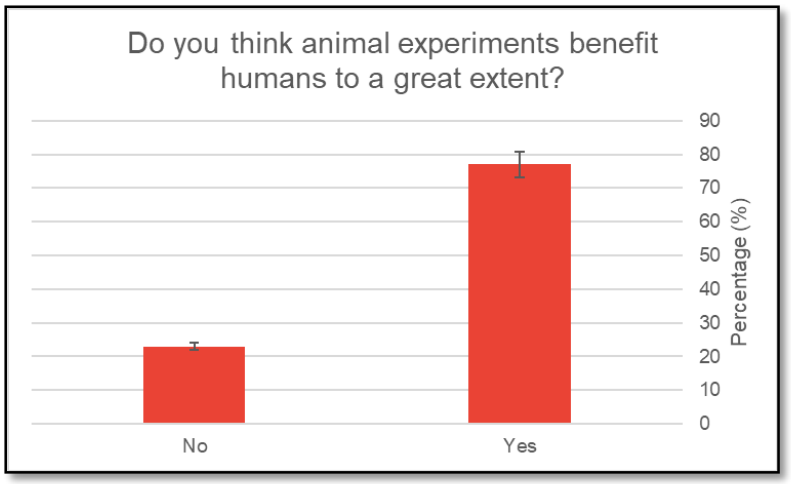

Figure 1 Do you think animal experiments benefit humans to a great extent argument (n=414)

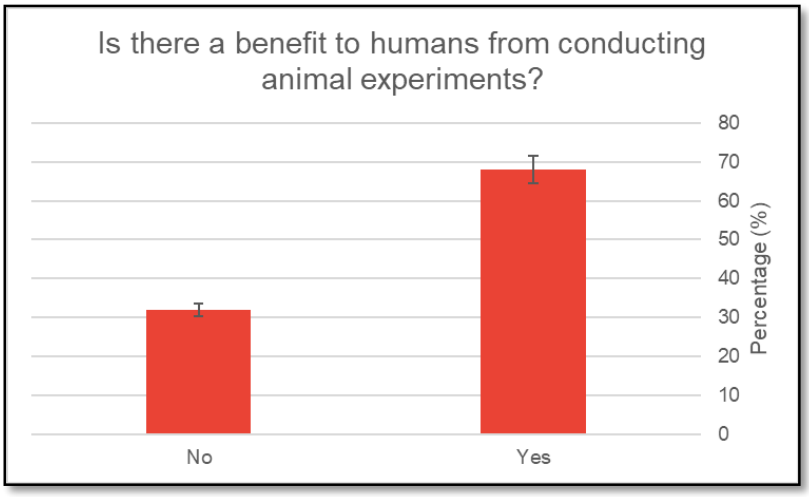

Figure 2 Is there a benefit to humans from conducting animal experiment argument (n=414)

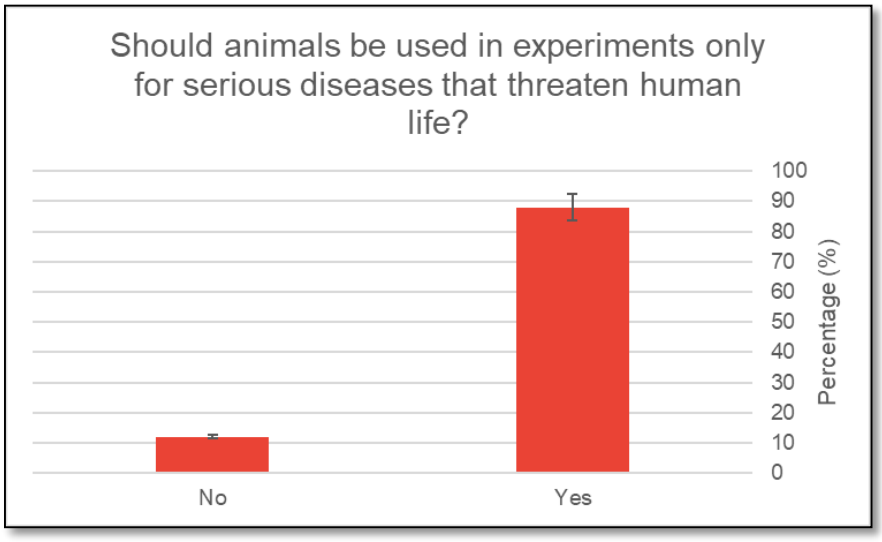

Figure 3 Can we use animals in experiments only for serious diseases that threaten human life argument (n=414)

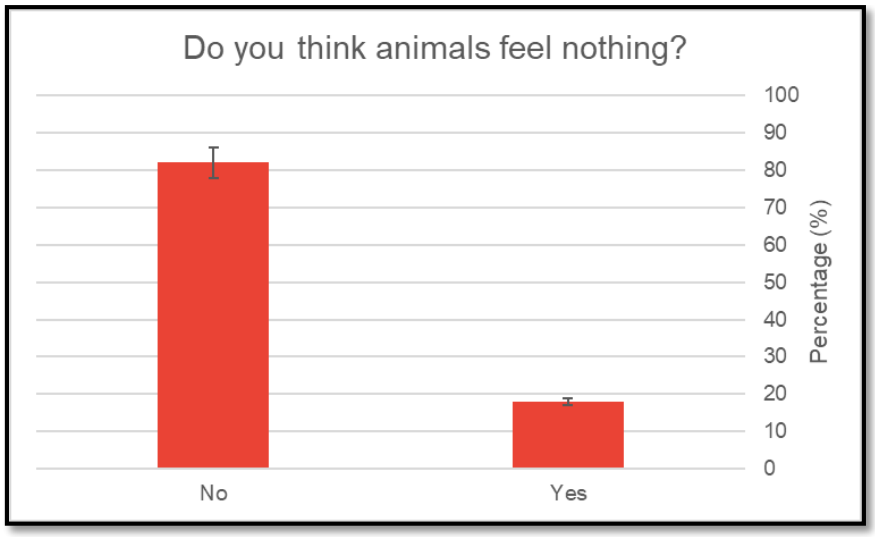

Figure 4 Do you think animals feel nothing argument. (n=414)

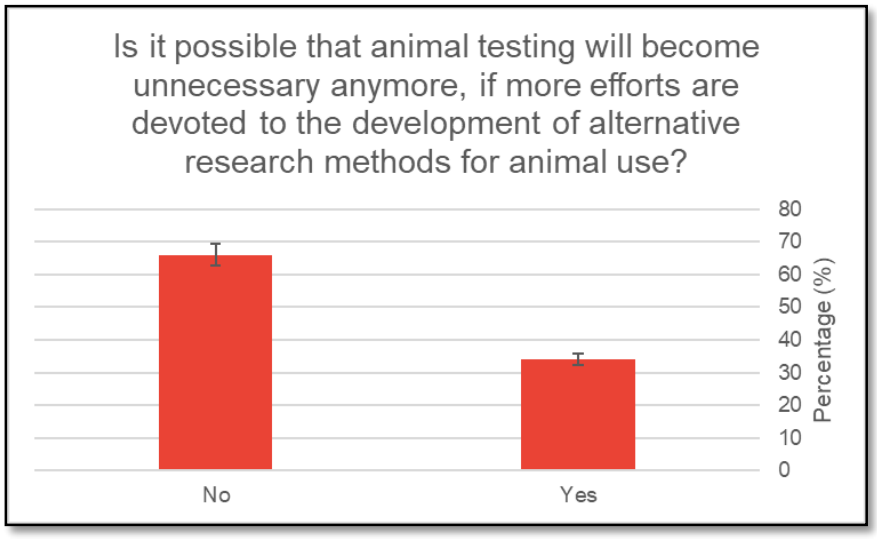

Figure 5 Is it possible that animal testing will become unnecessary anymore argument. (n=414)

4. DISCUSSION

Our objective of this study was to explore the opinion of the public towards using animals in research, drug trials and experimental procedures. Interestingly our results showed that around 56 percent of the participants were female, and their ages were from 18 to 24 years old. Moreover, the majorities were studying at universities especially health care colleges such as medical, pharmacy, nursing, and dental colleges and most of the participants were from the western province of Saudi Arabia. Our research results showed that around 88 percent of the participants see that using animals in research is beneficial for the humankind; in addition they were arguing that it's essential to use them to explore and treat ill conditions such as cancers, hypertension and diabetes. On the other hand, they disagreed about using other alternatives for animals in research around 60 % argued that it is not possible, and the rest had hope that it would be for the good of both human and animal's sake. Interestingly, around 17 percent of the participants argued that animals have no feelings which were odd about this subject.

Research done before about this subject were focusing only on the public opinion and not on the reasons and argumentations (Goodman et al., 2012; Joffe et al., 2014; Masterton et al., 2014; Chalmers, 2009). This research elaborated that people did not have any other justification for using animals that the researchers are in need to do this to help the humanity. However, research done in Northern America suggested more implications towards public argument for animal research; however more investigation is required (Joffe et al., 2016). One of the study limitations were that it was only a survey and for future recommendation to be an interview for more precise argument and concise opinion.

5. CONCLUSION

Responses of the public to the open arguments about research animal ethics are considered opinions that are not based on philosophical rationale and much debate will be essential to establish.

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We thank the participants who were all contributed to the sample of the study.

Author Contribution

All authors contributed to study conception, supervision, project administration, literature review and writing/ manuscript preparation: writing the initial draft, data collection, formal analysis and data presentation, data collection.

Ethical Approval

The study was approved by the Medical Ethical Committee of Umm Al-Qura University with number (HAPO-02-K-012-2022-02-944).

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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