

A survey of attitudes of Turkish veterinary students and educators about animal use in research

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ABSTRACT: In this study, veterinary students and veterinary educators from Firat Veterinary School, Istanbul Veterinary School and Selcuk Veterinary School were surveyed to evaluate their attitudes to animal use in research. Data were collected from 330 students and 204 educators by personal interviews. All participants showed anthropocentric attitudes toward animal use in research. Most of the participants agreed on items regarding the animal tests being easier, more scientific, more common, more economical and more reliable than alternative methods, but they also signified that they did not agree with the item indicating that the animal experimentation is more conscience. In conclusion, we can state that both the veterinary students and the educators are in a complete dilemma in the discussions regarding the animal experimentation. In order to avoid the negative circumstances that can arise from this dilemma, it could be said that veterinary schools should be supported in this aspect with related courses to be included within their curriculum.

Keywords: experimental animal; ethics; Turkey

In comparison with the previous periods, the 1970s were the years when discussions about the animal rights were quite hot and severe. In particular, through the triggering effect owing to the book of Singer (1977) called *Animal Liberation*, discussions on the moral status of the animal in general and on the animal use during researches in particular began to spread all around the world following these years.

Nowadays, the problems arising from the animal rights become one of the most debated agenda items in various countries and most of them put into force many regulations and legal limitations regarding the animal rights and animal use in research (AUR). The principal objective of these regulations is the reliability of the research and to standardize the animal use in these researches (Zutphen et al., 1993).

Besides the legal arrangements, the other conditions regarding the reliability of the research and the standardization of the AUR are required for “competent person” to be charged with the management of the organizations regarding the education both in theory and practice comprising the subjects with respect to the Science of the Laboratory Animals (Anonymous, 1986a,b). The authorized personnel working in the institutions concerning the laboratory animals in Europe who is called “competent person” (the specialist in the laboratory animals or the authorized person at the office dealing with the animal rights) is veterinary physicians specialized in any branches of science of the laboratory animals in general (Zutphen et al., 1993). In the USA, most animal facilities are also managed by veterinarians (Finn, 1997)

Veterinarians have an important role in safeguarding animal welfare. Their position requires considerable knowledge and understanding not only of laboratory animal medicine but also of the conditions and needs of biomedical research (Hagelin et al., 2000). However, relatively few veterinarians engage in animal research. Biomedical and scientific research accounts for a very small fraction of all animals used by society. Nevertheless, a discussion of professional veterinary ethics must consider issues relating to AUR (Tannenbaum, 1995). The veterinary schools have an obligation to ensure that undergraduate students are made aware of the importance of the use of animals in research. They must also clarify the dual role of veterinary specialists in ensuring the optimal welfare of the animals used in research while helping to provide for the experiments needed to advance biomedical sciences (Hagelin et al., 2000).

The introduction of courses regarding the subject on the AUR into the curriculum of veterinary schools in Turkey is relatively recent. Particularly, in the last decade when the accreditation to the European Association of Establishments for Veterinary Education is discussed, the programs in the schools were modified by this new approach and the lessons regarding the laboratory animals were put into the syllables in this last decade. However, the contents of optional lessons such as "Laboratory Animals" or "Laboratory Animal Breeding" are comprised of the subjects on the breeding, looking after and feeding conditions of laboratory animals and the subjects with regard to laboratory animal medicine or the use of laboratory animals are discussed during the courses. The discussions on the ethical dimension of the AUR were condensed in 1–2 hour lessons under the title of "Professional Ethics and Deontology" at the 9th semester.

The purpose of this study was to determine the attitudes, and factors affecting these attitudes, of veterinary students as well as educators concerning animal use in research in Turkey.

MATERIAL AND METHODS

The study was carried out among the students and educators at the Firat Veterinary School (FVS), Elazig, Selcuk Veterinary School (SVS), Konya, and Istanbul Veterinary School (IVS), Istanbul. The technique described by Krejcie and Morgan (1970) was used in the selection of the samples. Applying this

technique, 330 students out of the total number 2 233 and 204 educators out of the total number 418 were determined as the sample sizes for this study. Proportional stratum sampling was used to determine the number of samples needed for each school. Then, two different lists were formed in line with the school numbers of the students and the seniority of the educators. Taking into consideration the numbers of total students and educators from each school in the lists, the individuals to be included in the sample were determined according to a certain coefficient (systemized random sampling).

A questionnaire was developed to determine the attitudes towards AUR and the reasons for preferring animal use in research of the participants. The questionnaire was composed of three sections. Demographic information was collected in the first section. All participants in the first section were asked about five items that contained independent variables (level, gender, upbringing place, whether they have a pet or not and whether they have been trained about the ethical dimension of AUR or not).

In the second section, 15 items were chosen to represent the attitudes towards AUR. Eight of the subjects composing this set of AUR were based on the zoo-centric opinion, and seven of them were based on the anthropocentric opinions (Table 1). Items representing this set were developed on the basis of discussions with philosophers, scientists and veterinary educators as well as evaluation of the literature. These items were determined by using a random number table. In the final section of the survey, the participants were asked six closed questions to compare the reasons of their preference between alternative methods and AUR (Table 2). The survey was pre-tested by ten veterinary students and ten educators.

Likert scale was used for the second section. Positive items (zoo-centric) were scored from 7 for "strongly agree" through 1 for "strongly disagree" with "neutral" in the middle of the scale scored as 4. The scoring for the negative subjects (anthropocentric) was applied completely on the contrary (Tavsancil, 2002). When comparisons were made between groups for the set of AUR, a score < 4 was classified as disagreement with this set and interpreted as showing anthropocentric attitude toward AUR. A score ≥ 4 was interpreted as showing zoo-centric attitude toward AUR.

The survey was presented to all groups at the end of 2002–2003 academic period. The data were collected by personal interviews.

Table 1. The items regarding the set of animal use in research

The animal use in research misguides the science, and causes the loss of money and time

The animal research reflects only the biology of the searched species; thus such a research does not give any information about the human biology and psychology

The misguidance stemming from the data acquired from the animal researches delays the medical developments

Taking into consideration of the results acquired from the animal experiments is useful for the mankind, discussions about the animal use in research are useless

The animal use in research can only be accepted under the obligatory conditions. In other conditions, alternative methods should be used (such as test tubes and culture cells)

Animal should not be used in any condition; to this end only alternative methods (such as test tubes and culture cells) should be used

Application of experiments giving physical and psychological sufferings to animals is against animal rights

Exposing animals to the pain, stress and deprivation can only be accepted unless there is no other choice

Exposing animals to the pain, stress and deprivation is unacceptable

The cost and easiness of the research is more important than the physical and mental health of the animal

Nobody can claim that the mankind and the animals are same; but the animals are the closest models to the humans in the search of newer and more efficient treatment methods.

Application of experiments on animals is the best way to assure the human health

I always prefer a medicine tested by alternative methods rather than the medicine tested with animal experiments

There is no inconvenience to inject HIV virus to the animals in the studies for the development of a medicine against AIDS

If the animal guinea pigs are not alike to the human to the extent to be a model, then the experiments are useless. But if they are alike to form a model, then it is impossible to justify our behaviours that we do not show any human kind in any condition

SPSS Version 11.0 for Windows was used for all statistical analyses. Frequencies were used for demographic analyses. A mean rating was calculated for attitudes toward the set of AUR. *P* values were calculated for the parametric tests among groups. Independent Student's *t*-test was used to measure differences between gender, keeping a pet, instruction received, and between educator and student groups. Analysis of variance was used in order to determine

the differences between the university, age and upbringing place. Following these analyses, Duncan's test was applied for the group comparisons for the significant parameters. A chi-squared test was used to determine differences between the groups in the answers given to the third section (Akgul, 1997). *P* values < 0.05 were considered significant.

By using the data obtained from the research, the effects of age, gender, upbringing place, keeping a

Table 2. Animal experiments in comparison with alternative methods

Easier	() I agree with	() I am not sure	() I disagree
More scientific	() I agree with	() I am not sure	() I disagree
More economic	() I agree with	() I am not sure	() I disagree
More conscience	() I agree with	() I am not sure	() I disagree
More reliable	() I agree with	() I am not sure	() I disagree
More common	() I agree with	() I am not sure	() I disagree

pet, instruction received and university on the attitude toward AUR in all groups were determined by means of Linear Regression Modelling (Snedecor and Cochran, 1980).

$$Y_{ijklmn} = \mu + a_i + b_j + c_k + d_l + f_m + g_n + e_{ijklmn}$$

where: Y_{ijklmn} = the $ijklmn$ th observation for each trait
 μ = the population mean
 a_i = i the effects of level (age or class) ($i = 1, 2, 3, 4, 5$)
 b_j = j the effects of gender ($j = 1, 2$)
 c_k = k the effects of upbringing place ($k = 1, 2, 3, 4$)
 d_l = l the effects of keeping a pet ($l = 1, 2$)
 f_m = m the effects of instruction received ($m = 1, 2$)
 g_n = n the effects of university ($n = 1, 2, 3$)
 e_{ijklmn} = the error term ($0, \sigma^2_e$)

RESULTS

The demographic values of the independent variables such as level (age/class), gender, keeping a

pet, upbringing place and instruction received were determined in the study (Table 3). The scores obtained for each item composing the set of AUR and the mean value calculated for the set of AUR indicated that all the groups showed an anthropocentric attitude (Table 4). No statistical differences were observed between the students and the educators in terms of scores for the set of AUR. On the other hand, the attitudes of both the students and the educators toward the subject differed by the school. The value attributed to the set of AUR by the educators and the students of Istanbul Veterinary School was higher than the educators and the students of Firat Veterinary School and Selcuk Veterinary School (Table 4). The explanatory variables accounted for 32% ($R^2 = 0.32$) and 41% ($R^2 = 0.41$) of the variability in students and educators, respectively, about the attitudes toward AUR.

A common tendency was observed in the preference reasons of the participants. The participants claimed that the animal experimentation was superior to the other alternative solutions with the exception of the issue of "conscience". The difference between the answers given to the sub-statement in this section was noteworthy ($P < 0.001$). In contrast to the other statements, most of the

Table 3. Characteristics of students and veterinary educators from Firat Veterinary School (FVS), Istanbul Veterinary School (IVS), and Selcuk Veterinary School (SVS) who responded to a survey regarding AUR

Groups	Students				Educators				
	FVS	IVS	SVS	Total	FVS	IVS	SVS	Total	
Level (class/age)	1/21–30	15	23	22	60	15	34	17	66
	2/31–40	21	24	16	61	28	34	26	88
	3/41–50	22	26	17	65	9	17	16	42
	4/51–60	21	31	16	68	4	3	1	8
	5/–	24	27	25	76	–	–	–	–
Gender	Male	84	76	78	238	41	53	48	142
	Female	19	55	18	92	13	34	12	59
Upbringing place	Village	16	8	9	33	4	2	3	9
	Town	29	19	23	71	7	21	21	49
	City	41	30	36	107	40	24	15	79
	Metropolis	17	74	28	119	5	39	21	65
Keeping a pet	Yes	65	101	68	234	20	68	31	119
	No	38	30	28	96	36	20	29	85
Instruction received	Yes	23	58	42	123	7	27	25	59
	No	79	72	54	205	49	61	35	145

Table 4. Mean scores (sample sizes) for demographic groups for animal use in research (AUR) in veterinary students and educators from the Firat Veterinary School (FVS), Istanbul Veterinary School (IVS) and Selcuk Veterinary School (SVS) (score scale, 1 to 7)

	Groups	Set of AUR	
		Students	Educators
Level (Age/Class)	1/21–30	3.64 (57)	3.53 (65)
	2/31–40	3.29 (59)	3.34 (82)
	3/41–50	3.34 (61)	3.53 (41)
	4/51–60	3.66 (66)	3.81 (6)
	5/–	3.72 (76)	–
	<i>P</i>	< 0.001	> 0.05
Gender	Male	3.49 (231)	3.32 (135)
	Female	3.67 (88)	3.80 (55)
	<i>P</i>	< 0.05	< 0.001
Upbringing place	Village	3.46 (32)	3.43 (9)
	Town	3.31 (69)	3.50 (47)
	City	3.61 (106)	3.40 (75)
	Metropolis	3.64 (112)	3.49 (61)
	<i>P</i>	< 0.01	> 0.05
Keeping a pet	Yes	3.55 (226)	3.57 (112)
	No	3.51 (93)	3.31 (82)
	<i>P</i>	> 0.05	< 0.05
School	FVS	3.32 (102)	3.14 (52)
	IVS	3.80 (122)	3.86 (83)
	SVS	3.43 (95)	3.18 (59)
	<i>P</i>	< 0.001	< 0.001
Instruction received	Yes	3.55 (119)	3.47 (56)
	No	3.54 (198)	3.45 (138)
	<i>P</i>	> 0.05	> 0.05

participants declared that they did not agree with the claim asserting that alternative methods are “more conscience” than the animal experimentation (Table 5).

Level (class/age)

According to the points calculated by 7-degree Likert scale, both the educators and the students in each class/age groups showed an anthropocentric tendency in the moral aspect of AUR. Conforming to this dependent variable, no difference was detected between the age groups of the educators statistically; the students of the 1st, 4th and 5th classes

scored higher to the set of AUR than the students of the 2nd and 3rd classes ($P < 0.001$) (Table 4).

Gender

Female participants of both the educators ($P < 0.001$) and the students ($P = 0.035$) scored higher to the set of AUR than males (Table 4).

Upbringing place

Scoring of the educators for the set of AUR was not different statistically in regard to the upbringing

Table 5. Percentages (sample sizes) of the responses of all participants for preference reasons between alternative methods and animal use in research (AUR)

	Easier	More scientific	More economical	More conscience	More reliable	More common
Agree	60.4 (307)	73.8 (377)	50.9 (257)	17.3 (86)	70.6 (363)	72.7 (367)
Not sure	14.0 (71)	11.7 (60)	20.6 (104)	12.5 (62)	17.9 (92)	14.2 (72)
Disagree	25.6 (130)	14.5 (74)	28.5 (144)	70.2 (349)	11.5 (59)	13.1 (66)
<i>P</i>	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

place, but the students from cities and metropolises were closer to the zoo-centric line than the students from towns and villages and the difference between the groups was found to be statistically significant ($P < 0.01$) (Table 4).

Keeping a pet

For both the educators and the students, the set of AUR was scored higher by the participants keeping a pet than the participants not keeping any pet. However, only the difference between the scoring of the educators was significant ($P = 0.021$) (Table 4).

Instruction received

According to the answers regarding the scores acquired from the set of AUR and the reasons of preference, no statistically significant difference was observed between the participants attending a course regarding the ethical aspects of AUR and those not receiving such courses (Table 4).

DISCUSSION

Female participants were represented with a relatively low proportion in the sample owing to the fact that the total number of females at Firat Veterinary School and Selcuk Veterinary School was small. This might have caused a bias in favour of the male participants in the results of the study. Likewise, since a systemized random sampling (by a certain coefficient) was applied to determine participants within each school, more individuals might have been selected from the crowded classes and populous educator groups as well as

the educators at the same seniority level and thus, this might have resulted in a bias in favour of the populous groups and the educators at the same seniority.

The gender is the primary reason to show a definite trend in most of the studies aiming to determine an attitude towards the animal rights and AUR, and females represent a more zoo-centric trend than males in these matters (Gallup and Beckstead, 1988; Herzog et al., 1991; Driscoll, 1992; Broida et al., 1993; Furnham and Heyes, 1993; Eldridge and Gluck, 1996; Pifer, 1996; Ozen et al., 2004). The results of this study also proved that the female participants were closer to the zoo-centric line than males in both the groups of the educators and the students.

In a study carried out by Pifer et al. (1994), it was claimed that the urbanization was associated with consciousness about animal experimentation. In another survey conducted on medical and veterinary students at Upsala University, similar results were reported; the proportion of veterinary students being in favour of the claim that the animal experimentation is necessary for the human health was higher in those from the countryside than in the students of the urban origin (Hagelin et al., 2000). The results of the present study were also in accordance with those of Pifer et al. (1994) and Hagelin et al. (2000). The students of city and metropolis origin showed a more zoo-centric trend regarding the ethical dimension of AUR than the students of town and village origin. In addition to this, Pifer et al. (1994) claimed that the industrialism was related with the consciousness of animal experimentation. Likewise, the results of this study indicated that both the students and educators from Istanbul, where the industry is important and which has characteristics of a metropolis, showed an attitude closer to the zoo-centric line than the students from other cities (Konya and Elazig). This was also in

parallel with the results of Pifer et al. (1994) and Ozen et al. (2004).

In a few studies carried out on the undergraduate students of medicine, veterinary and other departments, most of the participants stated that AUR was acceptable in terms of moral aspect (Hagelin et al., 1999, 2000). Some studies reported that students given biology education or instructed in the avails of the bio-medical studies showed more positive attitudes towards AUR than the other students (Bowd and Boylan, 1986; Gallup and Beckstead, 1988). The values scored for the set of AUR in the current study, which indicated that the veterinary students in Turkey showed an anthropocentric trend in the aspect of AUR, supported the results of the above workers (Bowd and Boylan, 1986; Gallup and Beckstead, 1988; Hagelin et al., 1999, 2000). However, fluctuations were observed in the attitude of the students toward the subject by the year of education. The results reported by Hagelin et al. (1997, 1999, 2000) indicated that the senior students from medicine, veterinary and other departments found AUR more acceptable in the ethical aspect than junior students. Furthermore, the veterinary education was claimed to be associated with the acceptance of AUR (Hagelin et al., 2000). Some studies concerning this subject reported that younger individuals were more concerned about AUR than elders (Furnham and Pinder, 1990; Driscoll, 1992). In contrast, we observed that elder educators and the students at the 1st, 4th and 5th classes were closer to the zoo-centric line, and the difference between the students by class was statistically significant. The results obtained from the 1st year students were in agreement with the literature, and the results obtained from the 5th year students could be explained by the presence of ethical courses in which these issues are discussed. However, the values obtained from the educators and the 3rd and 4th year students were rather interesting, and were in contrast to the previous reports (Furnham and Pinder, 1990; Driscoll, 1992; Hagelin et al., 2000). When it is accepted that senior individuals (both students and educators) are much more educated than junior individuals, the above findings also contradict with the view put forward by Furnham and Pinder (1990) that the attitudes towards animal experiments are stemming from the general educational level. Differences in the curriculum of veterinary schools and cultural structure of Turkey might be responsible for this.

One of the subjects indicating an obvious trend of the determination of attitude regarding the ethical

dimension of AUR is the ability to communicate with the animals. The results of a number of surveys indicated that keeping a pet, growing up with a pet and accepting oneself as a pet lover or pet friend increased the level of concern about animal experiments (Furnham and Pinder, 1990; Driscoll, 1992; Furnham and Heyes, 1993; Paul and Serpell, 1993). Hagelin et al. (2000) noted that the students having a regular communication with the animals see themselves as much greater defenders of animal rights than the other students and they are more active in the protests against the animal experiments. We acquired similar results in this study. The educator participants having a pet showed a closer attitude towards the zoo-centric line than educators without pet. Although there was no significant difference, pet-keeping students gave higher scores to the set of animal use in research than the students without pet.

Crosby (2002) claimed that the reason for the dispute and failure of establishing a sound dialog between the defenders of animal rights and the defenders of animal experiments was the lack of communication. According to her, the dispute between these groups is just a dispute between the logic and conscience at the basis. She stated that the parties should give equal chances to both emotions during the decision taking process regarding the issue. We need to discuss the answers given to the “reasons of preference” within the study in this context. Without taking the differences between the educators and the students, we can accept that participants’ preference of the AUR rather than the other alternative methods in every aspect excluding the conscience signifies a contradiction between the conscience and logic. Experiencing both emotions at the same time by one individual can be accepted as a particular condition for veterinarians due to their relations with animals.

In conclusion, it can be claimed that both the educators and the veterinary students are in a complete dilemma regarding the discussions about the animal experiments and the academic curriculum should be supported with the related courses in order to eliminate the negative results of this dilemma.

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