

Perceptions of undergraduate students on the use of animals in practical classes

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ANIMALS have been used for years in practical classes of health and natural sciences to teach physiological or pathophysiological phenomena, observe effects of drug administration, acquire knowledge of internal anatomy, and develop technical skills for surgical procedures. A growing number of universities are, however, changing their policies and replace the use of animals with pedagogically sound alternatives (6, 10, 11).

Several studies have reported in the past on benefits that the use of animals can have for education, with some teachers claiming that they preferred to teach using this practice (14, 16, 20). They believed, for example, that through dissection, students could better gain insights into the complexity of an organism besides promoting the development of manual/surgical skills. For these authors, dissection would be the only way to give significance to teaching and learning anatomy and physiology in health sciences. According to Morrison (14), observations of internal structures and the function of these structures would only be possible through dissection, that is, through “direct science,” as students would need to use their eyes, hands, and brain.

Nonetheless, it is nowadays a worldwide trend among educators to reevaluate the use of animals in teaching and to take a careful view on other alternative educational methods (18). Among the issues at stake are the morality and instructional effectiveness of the use of the animals, mainly mammals, for teaching. It is frequently argued that these practices are contrary to the purpose of developing a respect for life and that it is necessary to reassess teaching methodologies, as there is now growing evidence that knowledge can be effectively obtained through other sources that respect animal life and can teach ethical values to the students (2, 5, 7, 19).

In our institution, where we teach physiology for pharmacy and dentistry, it is not rare to meet students that refuse to participate in practical classes, where live animals are used in teaching. Moreover, some colleagues claim that pharmacy students are more prone to justify the use of animals than dentistry students. On the other hand, there are also students who wish to have the experience with live animals and there are teachers highly committed to offer this opportunity to them. The present study aimed to assess the perceptions of undergraduate students of pharmacy and dentistry at our university campus about the use of animals in practical classes. Knowing

the perceptions of two groups of students on this issue, it was considered important for us to decide whether we should offer alternatives to them.

METHODS

The project was approved by the Research Ethics Committee of the School of Dentistry and the Faculty of Pharmacy and Biochemistry Sciences of Ribeirão Preto, University of São Paulo (process no. 2011.1.198.58.0). The research subjects were undergraduate students in the Dentistry ($n = 100$) and Pharmacy ($n = 100$) courses of these faculties. The inclusion criterion was that the students of both groups had already concluded the same Physiology and Pharmacology disciplines that use live animals, sedated (for invasive procedures) or not (for noninvasive procedures), for teaching in practical classes. Students were asked to fill out a questionnaire (validated by three colleagues) containing seven discursive and objective questions. Students were allowed to participate if they had shown adequate understanding when asked about the purpose and methodology used and had provided a signed statement of consent. The data were tabulated with percentages represented in the columns.

RESULTS

Most students of the two courses agreed that they had a good achievement (learned physiology) in practical classes with animals (*question A*) and that their use was important for learning (*question B*), as shown in Fig. 1. However, the majority of the students expressed mild to average discomfort when animals were used (Fig. 1C). When asked if anyone refused to stay in such practical classes (*question A*) or questioned professors or other student colleagues about the use of live animals in the classroom (*question B*), the responses were different when dentistry and pharmacy students were compared. While >50% of pharmacy students answered “yes” for both questions, this was less than the percentage of 40% for dentistry students (Fig. 2, *A* and *B*). Most students of the two courses furthermore agreed that there was a need for a discipline that contemplates bioethics issues on animal use (Fig. 3A). Nonetheless, when asked if they think the use of animals should be replaced by alternative methods, 58% of pharmacy students responded “yes,” whereas this was only 44% for dentistry students (Fig. 3B).

DISCUSSION

The results of the present study showed that most students of both groups considered that the use of animals was important for their learning despite the fact that they experienced mild to average discomfort when using them. However, when asked if the use of animals should be replaced by alternative methods,

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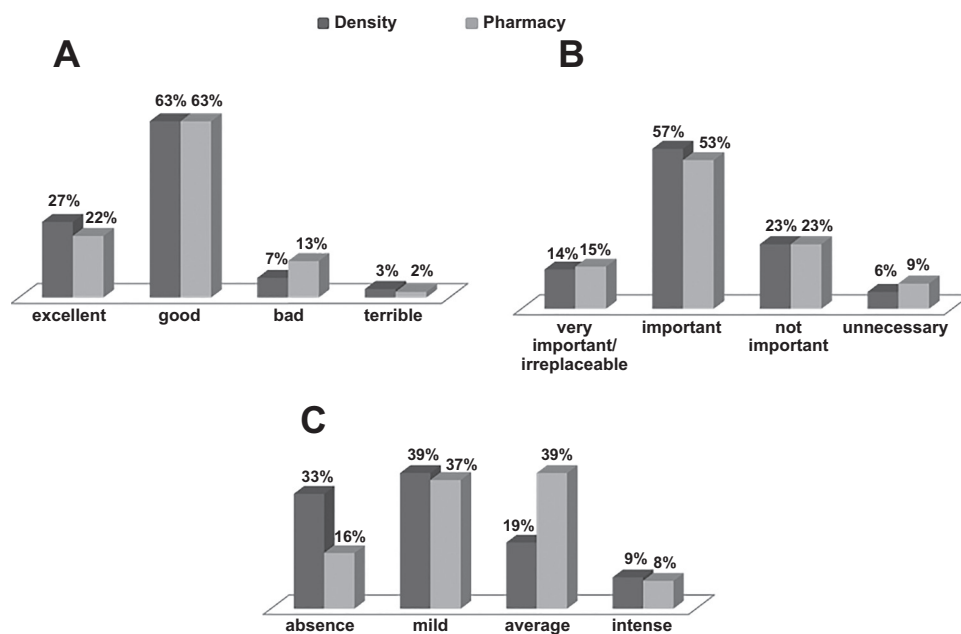


Fig. 1. Percentages of dentistry and pharmacy students choosing answers to the following questions: “How was your achievement in the practical classes with animals?” (A), “Evaluate the importance of practical classes for your learning” (B), and “Assess the level of discomfort during practical classes with animals” (C).

in contrast to what was previously thought by some teachers, the majority of dentistry students responded “no” and pharmacy students responded “yes.” Although is not clear why the pharmacy students felt differently than the dentistry students and what significance this observation might have, overall the results showed that in both courses, some students refused to stay in the classroom and questioned the use of the animals for learning to professors or other students. Although we do not have data on the portions of students that may hold religious or generation-specific views that may have large influence on their view about animal use, such discussions were thought to be initiated by students who are forced to commit acts that went against their principles (17).

According to some investigators, the majority of students, even though not comfortable with practical classes with live animals, would still take part in these activities. Most of them, however, expressed worries about the number of animals used for research or teaching or about their pain and suffering (7). We also noted that during the practical classes, our students would not talk about their thoughts spontaneously to the

teachers, although they would do so with other students, their colleagues. Therefore, we can conclude that using animals for observations or the acquisition of knowledge can lead to contradictory attitudes for some students (4).

These attitudes show the necessity of more research to find out the educational effects of the use of animals in practical classes and if ethical reflections can come alight through conflicting situations like this. Ethical conflicts in this area are unavoidable but can be minimized if teachers or researchers can convincingly show that they cannot replace animals and if they can emphasize the importance of the knowledge generated with their use.

Allchin (1) considered that ethical and philosophical issues should be integrated in biological courses and are important for student training, and he described how to deal with discussions about these issues in the classroom and how to address students in a respectful way, not authoritarian. Accordingly, we teachers should act as stimulators of discussions on ethical issues so as to enable students to formulate their own position, but keep some “neutrality” and respect the

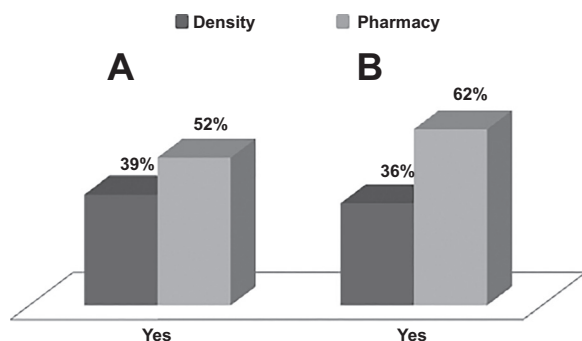


Fig. 2. Percentages of dentistry and pharmacy students answering the following questions: “Would you or a colleague have refused to remain in the class when experimenting with animals?” (A) and “At some point, did you discuss with or question a teacher or colleague about the use of animals in practical classes?” (B).

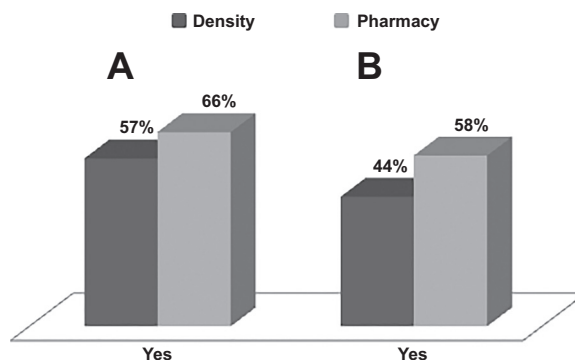


Fig. 3. Percentages of dentistry and pharmacy students answering the following questions: “Do you believe that there should be a class that contemplates bioethical issues in animal use in the curriculum of your course?” (A) and “Do you believe that the use of animals for teaching in practical classes should be replaced by alternative methods?” (B).

debate, and ensure that positions in favor or against the use of animals are honestly represented (1).

In fact, most of our students who participated in this survey agreed that there was a need for a discipline that contemplates animal ethics issues in their courses. However, despite the importance of such disciplines, a recent survey showed that there is a paucity of ethical issues teaching in the university curricula all around the world (9). Our country is no exception to this, since it is rare to find in our universities a class in the physiology curricula that offers the possibility of discussion on animal ethics. Nevertheless, the use of animals for teaching and research has started to be nationally regulated by the National Board of the Animal Experimentation Control (15), and our universities are now trying through their animal ethics committees to restrict the use of animals, not only for research but also for teaching purposes. This has generated several discussions between educators, with some already implementing alternatives and others refusing to replace the use of live animals or preferring to abolish their use due to the controversy (3, 8, 12, 13, 15). However, it is still rare to find studies about the perception of students on this subject. Therefore, although not object of a consensus yet, with the present study, we aim to contribute to the discussions about the use of live animals in our country.

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DISCLOSURES

No conflicts of interest, financial or otherwise, are declared by the author(s).

AUTHOR CONTRIBUTIONS

A.B.F.R. performed experiments; A.B.F.R., S.R.P., R.H.A.S., and M.J.A.R. analyzed data; A.B.F.R., S.R.P., R.H.A.S., and M.J.A.R. interpreted results of experiments; A.B.F.R., R.H.A.S., and M.J.A.R. prepared figures; A.B.F.R., R.H.A.S., and M.J.A.R. drafted manuscript; A.B.F.R., S.R.P., R.H.A.S., and M.J.A.R. edited and revised manuscript; A.B.F.R., S.R.P., R.H.A.S., and M.J.A.R. approved final version of manuscript; S.R.P., R.H.A.S., and M.J.A.R. conception and design of research.

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