# The scientific integrity issue in health graduate courses in Brazil

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**Abstract** This article presents a survey that aims at knowing the concern of health graduate course in formation of new researchers, including teachings on scientific integrity. The method used was the survey on 125 homepages of Brazilian graduate courses in health in which features related to scientific integrity were analyzed. More than one subject per course was analyzed, totalizing 183. The results show that out of evaluated programs, 59.5% belonged to medical area, and 97.6% had homepages available in the web, but not all made information related to the topic available. From it, one concludes that scientific honesty, fundamental in order to academic research gain credibility and scientific value, it is not yet a priority for teaching institution that, jointly with the scientific community, has an essential role in training ethically responsible scientists.

**Key words**: Education. Science. Scientific fraud.

The prestige conferred to the scientific knowledge and the progressive emergence of scandals involving the scientific misconduct has caused the scientific society to start worrying with the formation of the researcher and the social control of what has been produced by the scientific community.

The concept of *social control* has acquired several meanings in its historical trajectory [1]. Originally coined by the social sciences it expressed the State control over the individuals. The connotation used in this article, however, refers to that conferred by the health sciences which, through the multiple forms of inter-relation with society, re-signified the concept, characterizing it as citizen control over institutions and public

policies. Thus, in Brazil the social control refers to both research involving human beings – standardized by the creation of the ethics committees in research (CEP) and the CEP / Conep system, whose main objective is the protective of subjects involved in the research – as also reflected in the protection of good science, i.e., of science without frauds, forgery and plagiarism. In this case, the solution constructed by the scientific community has been the creation of regulatory bodies with social control duties [2.3].

In 1981, in the United States, the evidence of cases of bad scientific performance has produced a strong reaction by the U.S. Congress. Actions by the federal government of that country began to emerge in 1985 and, after four year, two organs were created: the Office Scientific Integrity (OSI) and Office of Scientific Integrity Review (Osir) which, in 1992, were joined to form the Office Scientific Integrity (ORI) [2]. The United States were followed by several countries who also were involved in the creation of their own means of regulation for the scientific practice , either repeating the American model or creating their own model.

In Brazil there is still not an organ responsible for identifying and discouraging scientific dishonesty. Therefore, until this moment it is not known the true dimension of the problem in the country [2,4]. The lack of studies on the theme leads to a reflection by Hans Jonas [5]: *While the danger is unknown we will not know what is there to protect and why we should do it ...*

The research work presented in this article seeks to respond to answer this situation of total lack of information on the subject, bringing an initial contribution so that later one can measure the problem in Brazil. To this end, we identified the need to know the concern of the graduation programs to include teaching on scientific integrity in the formation of new researchers. Toward this goal were analyzed the electronic pages of graduation programs in health, in order to seek indicatives of such type of teaching.

**Method**

The documentary analysis was the technique used for the execution of this study. Documents collected were of secondary type, available in electronic form, available at the electronic pages of the selected graduate courses . The collection was made in accordance the following steps: initially, it was collected at the site of the Coordination for the Improvement of Higher Education Personnel (Capes) a list of graduation courses evaluated by the institution. Next, were then selected programs that met the following inclusion criteria: a) course in the area of health, b) program with a Master's and Doctor’s degree , and c) program with a Capes concept of not less than five.

In possession of the listing with the identification of programs, the electronic page of each one was explored as to the information regarding the program (name, concept, location, institution and electronic mail) and the courses (syllabus, credits, number of class-hours, menu and objectives) that could
bring contents concerning the issue of scientific integrity - for example, bioethics, research methodology and advanced topics on research, among others. The information of interest was recorded in a database data, built especially for this purpose, using the Access 2000 software.

The collection of documents was made in ten days in the period from January 2 to 12, 2008. Previously, a pilot test was made to adjust the methodology and evaluation of the quality of the data found. After the data collection, the graduation courses were grouped into the following areas: Physical Education, Medicine, Collective Health , Nursing, Dentistry and Pharmacy, obeying the classification in areas proposed by Capes. In the area of Physical Education were also grouped courses of Physiotherapy, and the course of Nutrition was grouped with those of the medical area.

With regard to the identification of the existence of concern with scientific integrity in the graduation programs analyzed, data were then categorized as: 1) unavailable data, when the graduation program's page was not available, 2) present in this summary of the course, if a mention was made to the theme on the syllabus; 3) present in the programmatic content of the course, when the theme content was part of the proposed content for one or more courses, 4) present in the objectives of the course, if explicit in the objectives to be achieved, or 5) absent, when there was no citation. The phrases used to identify the concern with the subject of study were: *ethics and research*, *ethical aspects of research*, *scientific fraud*, *ethics versus science*. The selection of the descriptors was based on the checking of the presence of these terms in the bibliography regarding the theme.

**Results**

126 graduation programs were found that met the previously established criteria for inclusion, which were grouped according to the citation in the methodology.

From the total evaluated, 82.5% belonged to programs whose institutions are located in the Southeast region. Most of the courses was categorized in the medical area (59.5%), followed by Dentistry (16.6%), Public Health (7.9%) Physical Education (6.4%), Pharmacy (5.6%), and Nursing (4.0%), respectively. Among the 126 programs in 15 the courses were not available: in three, the electronic pages were unavailable and in one the section regarding the courses was still under construction in the period of the data collection.

We selected all courses of every program that could present the content of scientific integrity. 183 courses were analyzed , because in some programs were found more than one course with reference to the theme.

Several phrases have been identified in the program contents of the curses in their syllabus or the objective of each program, which led to believe that it was a subject related to scientific integrity. The word *scientific fraud* was cited in three courses that belong to programs in the medical area, two of them in the same program. The expression *the ethics and the survey* was repeated 16 times; the term *ethics versus science* was used once only. Besides these, we found in 15 courses the use of miscellaneous terms , like *scientific behavior and bad conduct in science*.

Of the 183 subjects studied, 16 (8.7%) address the ethical issue in scientific research in the syllabus of the course, 15 (8.2%) t treat it in the syllabus and five (2.7%) in the objectives. The remaining (80.4%) were omissive regarding the topic of the research. Of the courses evaluated you realize it can be noticed that there is a greater concern about

ethics in scientific research between those of the area of Medicine (10.3%), followed by Dentistry (6.3%) and Nursing (2.4%), respectively.

## Discussion

The concern with ethical issues in the areas of Medicine, Dentistry and Nursing suggests that the issues related to ethics of the research are more widespread in the same.

The phrase "*ethics is research*" was the most prevalent, which leads to issues relating not only to the scientific integrity, the object of interest of this study, but also the research involving human beings as well as the utilization of animals in laboratory. Thus, it was not clear the real intent of the course when it used that expression. Only two courses in the medical make it explicit the concern with the question of scientific integrity, since they use the term *fraud in research* in a course syllabus

Some authors emphasize the responsibility of researchers and scientific institutions in the promotion of good practices in science and in the elaboration and establishment of measures preventing fraud [6], among which is the formation of trustful researchers [7]. There's no doubt that one can formulate and transmit a code of conduct for the responsible and committed scientific practice [8]. However, the results of the survey on the subject in the sites of the graduation programs in the area of health indicate that the concern with the scientific integrity in our country is still limited to few courses.

Given this gap in the education of professionals in the area, we can infer that in Brazil, regardless government actions, the teachers, researchers, research groups and universities should assume educational practice targeted to the formation of everyone involved with the research [2.4]. The higher education institutions must be prepared to transmit to students and young researchers the importance of exercising the scientific activity with rigor and honesty.

The results obtained showed that not there is concern with the issue of scientific integrity in most graduation programs in health developed in the country, since only 19.56% of the courses evaluated expressed concern with the scientific honesty. In programs that mention ethics in science, the terms used are varied and most do not express objectively the concern with scientific integrity. It should be considered, however, that this study was limited to the analysis of documents available in graduation programs sites evaluated in the period established for the collection. Thus, it is necessary to note that the evaluation of these programs needs to be considered partial, given that the analysis was based only on the information available at the time of access. No another type of communication was made to obtain additional information. Thus, it seems advisable the continuity of study to know the real dimension of the problem in the education of researchers in Brazil.

## Final considerations

Situations such as data fabrication, forgery of results and curricula, plagiarism, undue authorship of works, conflict of interests, biased interpretation of data, resistance to the publication of research with negative results, among other undesirable practices, has drawn attention and concern of the scientific community and society in general,

especially in technically advanced countries [8]. Fraud in scientific research is a dangerous and costly practice, because besides the loss of time and expenditure of public resources, especially in terms of research in health, the forged results can be taken as references and brought into the practice, which would put at risk
the lives of human beings.

Scientific honesty both in the conduction and in the presentation of the experiments, is essential for the research to meet the objective of producing knowledge of relevant scientific value. To reach this goal, the educational institutions and scientific community have a fundamental role, since they are directly related and are responsible for the formation of future scientists. Such responsibility is not exhausted by the transmission of technical knowledge, but involves, including the dissemination of ethical stance, an essential condition for the credibility of the researcher and the experiment.

Consequently, professors, researchers and institutions must be able both to educate for the professional practice and research, guided for ethics, and to discourage dishonesty in science. The transmission of this knowledge may occur through the formal teaching planned for the different disciplines, through the good example of professors and researchers and even by the sanctions of the academic community and institutions to the researchers and academic institutions and professionals who violate the norms and ethical principles in their activities. This would be a way to exercise control among social peers

The need to foster the highest degree of ethics in academia as well as between professionals in the area of health, essential to the scientific production of quality, is especially important in our country, which still has no public institutions for the exercise of the functions of regulation and control of scientific ethics. Due to this regulatory gap it is institutional indispensable to have the support of the society to identify, unmask and inhibit the lack of ethics in scientific practice. Thus there will an expansion of the social control to a wider sphere , using this mechanism - already consolidated in different areas of health - also to promote scientific integrity in our country.

It is important to emphasize that this study deserves considerations, since it was limited to the analysis of documents available on the websites of graduation programs evaluated in the period established for the collection. Thus, one must be considered that a partial evaluation was made of the programs, using only the information available for access. It was not performed any other type of communication to obtain additional information. Thus, it is recommended the continuation of similar studies for a better understanding of the real dimension of the problem in the formation of the researcher
in Brazil.

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**Resumo**

**O tema da integridade científica nas pós-graduações em saúde no Brasil**

Este artigo apresenta pesquisa que objetiva conhecer a preocupação dos programas de pós-graduação em saúde na formação de novos pesquisadores, incluindo ensinamentos sobre integridade científica. O método utilizado foi o de pesquisa nas páginas eletrônicas de 126 programas de pós-graduação em saúde brasileiros, nas quais foram analisados os aspectos relacionados ao tema da integridade científica. Foram analisadas mais de uma disciplina por curso, totalizando 183. Os resultados mostram que dos programas avaliados 59,5% pertenciam à área médica e 97,6% possuíam páginas eletrônicas disponíveis na internet, mas nem todas disponibilizavam informações relativas ao tema. Os resultados indicam ainda que não existe preocupação com o tema da integridade científica por parte da maioria dos programas de pós-graduação em saúde no país. Disso se conclui que a honestidade científica, primordial para que a pesquisa acadêmica tenha credibilidade e valor científico, ainda não é prioridade das instituições de ensino que, juntamente com a comunidade científica, têm papel fundamental na formação de cientistas eticamente responsáveis.

**Palavras-chave:** Ensino. Ciência. Fraude científica.

**Resumen**

**El tema de la integridad científica en las pos-graduaciones en salud en Brasil**

Este artículo presenta pesquisa que objetiva conocer la preocupación de los programas de pos-graduación en salud en la formación de nuevos investigadores, incluyendo enseñanzas sobre integridad científica. El método utilizado fue el de pesquisa en las páginas electrónicas de 126 programas de pos-graduación en salud brasileños, en las cuales fueron analizados los aspectos relacionados al tema de la integridad científica. Fueron analizadas más de una disciplina por curso, totalizando 183. Los resultados muestran que de los programas evaluados el 59,5% pertenecían al área médica y el 97,6% poseía páginas electrónicas disponibles en la internet, pero no todas ponían a disposición informaciones relativas al tema. Los resultados indican también que no existe preocupación con el tema de la integridad científica por parte de la mayoría de los programas de pos-graduación en salud en el país. De eso se concluye que la honestidad científica, primordial para que la pesquisa académica tenga credibilidad y valor científico, todavía no es prioridad de las instituciones de enseñanza que, juntamente con la comunidad científica, tienen papel fundamental en la formación de científicos éticamente responsables.

**Palabras-clave**: Enseñanza. Ciencia. Fraude científico.

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