

Scientific integrity and copyright in codes of professional ethics

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Abstract

Scientific integrity presupposes respect for ethical and legal principles for the design, development and publication of research. The objective of this study was to analyze compliance with Brazilian and international regulations on scientific integrity and copyright described in the codes of professional. It is a documentary and descriptive research in which 11 codes of ethics of regulated professions in the field of health and human sciences were selected and analyzed. The results show that the codes of professional ethics with the highest number of cited descriptors were the ones that best met the national and international norms on research ethics. There was, however, no code that adequately covered all the Brazilian and international standards used as reference for analysis. It was concluded that these documents should be reformulated with the objective of empowering professionals and researchers from different fields of knowledge to act in a way that respects scientific integrity and copyright.

Keywords: Ethics, research. Codes of ethics. Legislation. International acts. Scientific integrity review. Copyright.

Resumo

Integridade científica e direitos autorais nos códigos de ética profissional

Integridade científica pressupõe respeito aos princípios éticos e legais para elaboração, condução e publicação de pesquisas. O objetivo deste estudo foi analisar a observância da regulamentação brasileira e internacional sobre integridade científica e direitos autorais descrita nos códigos de ética profissional. Trata-se de pesquisa documental e descritiva, na qual foram selecionados e analisados 11 códigos de ética de profissões regulamentadas na área de ciências da saúde e humanas. Os resultados demonstram que os códigos de ética profissional com mais descritores citados foram os que melhor contemplaram normas nacionais e internacionais sobre ética em pesquisa. Não houve, contudo, nenhum código que abrangesse adequadamente todas as normas brasileiras e internacionais utilizadas como referência para análise. Concluiu-se que esses documentos deveriam ser reformulados com o objetivo de empoderar os profissionais e pesquisadores de diferentes áreas do conhecimento para atuar de forma a respeitar a integridade científica e os direitos autorais.

Palavras-chave: Ética em pesquisa. Códigos de ética. Legislação. Atos internacionais. Revisão de integridade científica. Direitos autorais.

Resumen

Integridad científica y derechos de autor en los códigos de ética profesional

La integridad científica presupone el respeto a los principios éticos y legales para la elaboración, conducción y publicación de investigaciones. El objetivo de este estudio fue analizar la observancia de la reglamentación brasileña e internacional sobre la integridad científica y los derechos de autor descritos en los códigos de ética profesional. Se trata de una investigación documental y descriptiva, en la cual se seleccionaron y analizaron 11 códigos de ética de profesiones en el área de las ciencias de la salud y humanas. Los resultados demuestran que los códigos de ética profesional con mayor número de descriptores citados fueron los que mejor contemplaron normas nacionales e internacionales sobre ética en investigación. No hubo, sin embargo, ningún código que contemplara adecuadamente todas las normas brasileñas e internacionales utilizadas como referencia para el análisis. Se concluyó que esos documentos deberían ser reformulados con el objetivo de empoderar a los profesionales e investigadores de las diferentes áreas del conocimiento para actuar de forma tal de respetar la integridad científica y los derechos de autor.

Palabras clave: Ética en investigación. Códigos de ética. Legislación. Actos internacionales. Revisión de integridad científica. Derechos de autor.

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Scientific integrity can be understood as respect for ethical and legal principles for the design, conduct and publication of research. It involves adherence to aspects such as impartiality of the researcher during the development of the research, legitimacy of the data used and results achieved, correct establishment of authorship and co-authorship, compliance with regulated copyrights and attention to the vulnerability of research participants, considering also the dignity of the human person and the risks and benefits to the actors involved. In addition, it is important that there is no conflict of interest between researchers, sponsors and study participants, so that the impartiality of the project is not impaired¹.

These aspects were addressed by Resolution 466 of the Conselho Nacional de Saúde – CNS (National Health Council) of December 12, 2012¹, published on June 13, 2013, which revoked Resolution CNS 196/1996². This resolution deals with the guidelines and norms regulating human research, and should cover research from all areas of knowledge, including health and humanities. In practice, it is applied mainly to research in health sciences and does not cover the methodological specificities of other areas, especially studies with a qualitative design^{3,4}.

The Resolution CNS 510⁵ was published in 2016. It deals with the ethical specificities of researches in human and social sciences and others that use methods similar to the ones used in those fields, and is aimed at protecting the rights of study participants. This was the first Brazilian norm focused specifically on these areas⁶, which represents an achievement for research ethics. Adding to that legislation, we have the Law 9,610/1998⁷. It protects the author's rights on intellectual works, independent of registration, and it makes explicit the protection of scientific texts on its article 7⁹.

In scientific practice, legislation and ethics must act in an interconnected manner. The distinction between the two refers to the application, since non-compliance with the law provides sanctions, unlike ethical guidelines. However, codes of professional ethics, when regulated by a federal council capable of enforcing it, can determine penalties in case of non-observance of their rules, going from warnings to prohibition of the legal practice of the profession⁸.

In addition to Law 9,610/1998⁷, the report published by the Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq (National Council for Scientific and Technological Development) in 2011 defines measures to curb plagiarism, self-plagiarism, improper inclusion of

co-authorship and manipulation of information and results⁹. These precautions should be emphasised, in view of the increase in cases of retraction of articles published in scientific journals due to fraud and copyright infringement¹⁰, crime also provided for in article 184 of the Código Penal (Penal Code)¹¹.

The importance of scientific production is increasing in Brazil. The country ranked 17th in the 2002 world ranking, reaching the 13th position in 2011¹². In addition, the country hosted the 4th World Conference on Scientific Integrity in 2015¹³, and in 2016 the 4th Encontro Brasileiro sobre Integridade na Pesquisa, Ética na Ciência e em Publicações - Brispes (Brazilian Meeting on Research Integrity, Science and Publication Ethics)¹⁴. It should be noted, however, that the scientific research indicators count the number of articles published and the number of citations, but not the quality of the works¹⁵. Thus, it is a favourable scenario for the production of articles in series in postgraduate, master's and doctoral institutions without the proper rigor of scientific integrity¹⁶.

In this context, ethics in research involving human beings becomes extremely relevant, especially with respect to vulnerable individuals or groups¹⁷. Vulnerability is characterised as a condition of persons or groups with diminished power of choice or even devoid of influence and neglected in the decision-making process, with several possible causes. These people are susceptible because of their difficulty of resisting the decisions of third parties, legally indicated as responsible¹.

Even if the person is aware and able to choose, one must minimise their vulnerability by proving that they have understood the issues involved in research participation. It is essential that effective consent is provided for inclusion in the study. The mere signature of the form is not an indication that the potential participant understood the information or effectively consented to the procedures, since it is necessary to guarantee the recognition of the autonomy and dignity of the subject⁸.

The discussion of respect for the dignity of research participants was resumed in 1947 with the *Nuremberg Code*¹⁸. After World War II, international authorities realised the need to regulate research methods, taking into account that during the conflict scientific experiments were carried out in disagreement with human rights^{19,20}. In the last 70 years, several national and international documents have emerged, which are constantly improved and regulated, especially by CNS committees^{1,21,22} and international organisations such as the World Medical Association (WMA)²³.

International documents such as the *Declaration of Helsinki*²³, originally written in 1964 with subsequent modifications, the last being in 2013, and the *Universal Declaration on Bioethics and Human Rights* (UDBHR)²⁴, from 2005, were also developed. These are examples of international normative statements that provide in detail the need for prior and free consent of the participant of studies. They also include specific guidelines on the participation of persons unable to consent. The *Berne Convention*^{25,26} written in 1886 and much revised, most recently in 1971 - covers the protection of scientific works on an international level. Its provisions were essential to reach consensus in the field of research ethics²⁷.

Despite all these years of discussion about ethical principles in human experiences, there are still different degrees of protection of human beings as research subjects, which can be seen from the different approaches in depth and content of each code of professional ethics²⁸. The effective orientation of each professional council to its members who act as researchers was analysed from the systematised reading of specific articles and chapters on the subject.

This research was motivated by the lack of studies that relate ethics in research with human beings in the areas of health sciences and humanities to the respective codes of professional ethics, evidenced by the search in electronic databases with specific keywords for the theme of the study. The theme is relevant to discuss the need to consolidate specific ethical guidelines for the human sciences area, since Brazilian and international regulations were elaborated with reference to biomedical researches carried out in the health sciences²⁹.

This study seeks to answer the following questions: Is scientific integrity and respect for copyrights included in the codes of ethics of the health sciences and humanities, promoting their application by professionals in researches with human beings? Are health and humanities professionals fully empowered by their class councils and codes of professional ethics and able to respect the vulnerability and dignity of research participants?

Goals

This article aimed to analyse aspects of scientific integrity related to research involving human beings and the copyrights described in the

professional codes of ethics in health sciences and humanities. It also aimed to analyse compliance with the Brazilian and international regulations on scientific integrity by codes of professional ethics in health sciences (specifically medicine, nursing, speech and language therapy, physiotherapy and occupational therapy, nutrition, physical education, pharmaceuticals and dentistry) and human (psychology, sociology and geography).

Method

Documentary, descriptive and qualitative research was carried out in which the professional codes of ethics in force were analysed by federal and national councils and scientific societies in the areas of health and human sciences, delimited by the classification of the CNPq published in 2011³⁰. Codes drawn up by regional councils and associations are excluded, in order to standardise the analysis, whilst the codes of ethics of regulated professions were included. All other codes were excluded.

Eleven codes of professional ethics were analysed, focusing on the articles and chapters referring to human research. The following codes of health sciences were analysed: medicine (2009)³¹, dentistry (2012)³², pharmacy (2005)³³, nursing (2007)³⁴, nutrition (2018)³⁵, speech and language therapy (2016)³⁶, physiotherapy and occupational therapy (2013)³⁷, and physical education (2015)³⁸. The following codes of professional ethics were chosen from humanities: psychology (from 2005)³⁹, sociology (2013)⁴⁰, and geography (2014)⁴¹. It is important to point out that the code of ethics of medicine³¹ is in the process of revision, with a new version expected to be published in 2019.

We chose to use as research method a systematised research in each professional code of ethics by category, including the descriptors: "autonomy", "beneficence", "confidentiality or secrecy", "informed consent", "research involving human beings" and "copyright". The results were described in a form specially prepared for this studying are reproduced in Tables 1 and 2, which systematise the collected information.

The aspects that appeared in each code were listed and related to Brazilian regulations and international declarations on research ethics in order to observe if there was correct adherence to the norms and binding guidelines of each document. National reference was taken, above all, from Law 9,610/1998⁷, which deals with copyright in Brazil,

and CNS resolutions^{1,21,22}, with emphasis on the Resolution CNS 466/2012¹, which defines guidelines and standards regulating research with human beings.

At the international level, the following documents were selected: the *Nuremberg Code*¹⁸, adopted in 1949; the *Helsinki Declaration*²³, adopted in 1964 and revised in 2013; the *Universal Declaration on Bioethics and Human Rights*²⁴, adopted in 2005; the *Berne Convention*^{25,26} adopted in 1886, revised in 1971 and promulgated in Brazil in 1975; and the *International Ethical Guidelines for Health-Related Research Involving Humans*, which was prepared by the Council for International Organizations of Medical Sciences (CIOMS)⁴² in collaboration with the World Health Organisation (WHO).

The results were analysed in light of publications included in the electronic databases Lilacs, Medline and PubMed. Articles published between 2002 and 2016 were considered, with the following terms being searched in Portuguese and in English: “scientific integrity and code of ethics” (or “codes of ethics”); “Copyright and codes of ethics”; “Ethics in human research and codes of ethics”; “Codes of ethics and professional ethics”. Editorials and letters to the editor were excluded because they did not present scientific relevance for the discussion.

Results

This research included the analysis of codes of professional ethics in the area of human sciences and updated data collected in codes of professional ethics of health sciences. In addition, the codes have been evaluated for compliance with standards of a hierarchically superior nature - international declarations and norms of more specific content - resolutions and copyright legislation. It is also important to study the Brazilian codes of professional ethics, in view of the existence of research on codes from other countries.

It is worth mentioning that Resolution CNS 466/2012¹ was analysed under the light of the UDBHR²⁴. It was concluded that the first deals specifically with the regulation of research involving human beings developed in Brazilian territory and is restricted to the daily practice of health professionals and researchers. On the other hand, the UDBHR is an international document of greater applicability and comprehensiveness⁴³.

From the analysis of the documents, it was observed that the codes of ethics of medicine³¹, nursing³⁴, physiotherapy and occupational

therapy³⁷, nutrition³⁵, dentistry³², speech and language therapy³⁶ and pharmacology³³ have a chapter dedicated to research, which demonstrates the importance of the subject for these professional categories. As far as copyright is concerned, only the sociologist's code of ethics⁴⁰ presents an exclusive section on the subject, in which it deals with plagiarism. This subject is only mentioned by the codes of medical ethics³¹, nursing³⁴, physiotherapy and occupational therapy³⁷, nutrition³⁵, dentistry³², speech and language therapy³⁶, pharmacology³³ and sociology⁴⁰. In the codes of medical ethics³¹, nursing³⁴, nutrition³⁵, physiotherapy and occupational therapy³⁷, dentistry³², speech and language therapy³⁶ and sociology⁴⁰ there is reference to research ethics, while in the other four this was not observed.

From a specific analysis, it is highlighted that in the code of medical ethics³¹ the autonomy of the subject of the research is discussed from the term of free and informed consent, recommended by Resolution CNS 466/2012¹, in its item III.2, letter g, and the guidelines IX and X of the Cioms⁴². Patient autonomy is evidenced when addressing the choice of treatment, but there is no direct mention to the autonomy of the research subject, as established in guideline IX of the Cioms⁴². It is perceived that questions of confidentiality and secrecy need to be specifically addressed in human research, as indicated in item II.5 of Resolution CNS 466/2012¹, article 24 of the *Declaration of Helsinki*²³ and in guideline XI of Cioms⁴². In general, the code of medical ethics complies with the normative provisions of the copyright law with specifications on the criteria of authorship.

The code of ethics of physiotherapy³⁷, on the other hand, addresses beneficence, confidentiality and autonomy of the patient in the scope of professional practice, but does not mention research with human beings. Nevertheless, it refers to conflicts of interest that may arise in research, scientific integrity, and copyright. Finally, it also regulates compliance with specific legislation for scientific studies. The text lacks emphasis on the vulnerability of the research subject, as provided by Resolution CNS 466/2012¹, in its item III.1, letter a.

The code of ethics of the geographer⁴¹ refers to the role of the professional in the well-being and development of the human being, but does not mention research. This document does not meet the minimum requirements of Resolution CNS 466/2012¹, the *Declaration of Helsinki*²³ or the *Nuremberg Code*¹⁸. It should be noted, however, that these documents

are directed to health research⁴⁴. The code of ethics of the pharmacologist³³ cites autonomy and secrecy strictly related to professional practice. It is worth mentioning, however, that this code emphasises the protection of vulnerable individuals who participate in research, besides indicating the free and informed consent term. Copyright is also treated in order to contemplate Law 9,610/1998⁷.

The nursing ethics code³⁴ also duly refers to copyright, respecting Law 9,610/1998⁷ and the *Berne Convention*^{25,26}. In addition, it addresses the risks and damages to research participants and scientific integrity, making clear the importance of the subject for professionals in the category. It regulates that the identification of the patient in a study can only be divulged with the patient's authorisation, which demonstrates respect to article 24 of the *Declaration of Helsinki*²³ and to article 9 of the UDBHR²⁴.

The code of ethics of psychologist³⁹ addresses professional secrecy in the context of everyday practice, but does not refer to research with human beings. It includes the term of free and informed consent, which shows concern about respect for the autonomy of the research volunteer. However, it does not refer to copyright, a fact that goes against specific legislation and the *Berne Convention*^{25,26}.

The code of ethics of the speech and language therapist³⁶ addresses respect for ethical and legal norms and copyright, demonstrating the importance that these subjects assume for this category. It should be emphasised that the mere reference to the compliance with the ethical-legal norms on the

practice of research does not exempt the code from the direct approach of the subject. In addition, the code brings consent for use of data or images, but it does not refer to free and informed consent for the development of research. Respect for privacy and confidentiality is referred to in a general way, without mention of confidentiality in research, as recommended by the guideline XI of the Cioms⁴².

The code of ethics of dentistry³² deals with the preservation of the autonomy of the individuals in its preliminary dispositions, without specifying the participants of the researches. Beneficence is generally approached as to the exercise of the profession for the health of human beings, and the code deals with professional secrecy only. The term of free and informed consent and copyright are mentioned.

The code of ethics of nutritionists³⁵ addresses beneficence, respect for human beings involved in research, the need for approval by the Ethics and Research Committee, and copyright in the chapter devoted to research. It also deals with respect for autonomy and confidentiality but only in the context of everyday practices. Informed consent was not included in this code. As for the code of ethics of the physical educator³⁸, aspects involved only in the exercise of the profession are mentioned and in a more pragmatic way, such as autonomy and professional secrecy. Research, ethics or copyright were not mentioned in any relevant way.

The sociology code of ethics was not included in Table 2 because it was organised in titles rather than in articles.

Table 1. Synthesis of descriptors searched in codes of professional ethics of health and social sciences and their correlation with Brazilian and international documents used as reference.

	Year	Autonomy	Beneficence	Confidentiality	Informed consent	Research with human beings	Copyright	Scientific integrity
Resolution CNS 466	2012	Item I; Item III.1, letters a and j; Item IV.1, letter j; Item IV.6, letter b	Item I	Item IV.3, letter e; Item III.2, letter i	Main content of the resolution	Main content of the resolution	No occurrence	Item I
Law 9,610	1998	No occurrences	No occurrences	No occurrences	No occurrences		Content of the law	No occurrence
<i>Declaration of Helsinki</i>	2013	No occurrences	Principles 4, 8 and 14	Principles 9 and 24	Principles 25 to 30	Principles 2, 5, 10, 17 e 18	No occurrence	Main content of the Declaration
<i>Nuremberg Code</i>	1949	Principle 9	Principle 10	No occurrences	Principle 1	Main content of the document	No occurrences	Main content of the document

continues...



Table 1. Continuation

	Year	Autonomy	Beneficence	Confidentiality	Informed consent	Research with human beings	Copyright	Scientific integrity
<i>Universal Declaration on Bioethics and Human Rights</i>	2005	Article 5	No occurrences	Article 9	Principle 1	No occurrences	No occurrences	No occurrences
<i>Berne Convention</i>	1975	No occurrences	No occurrences	No occurrences	Articles 6 and 7	No occurrences	Main content of the document	No occurrences
Cioms	2016	Guideline X	Guideline IV	Guidelines XI and XII	Guidelines IX and X	Main content of the document	No occurrences	Guideline 1

Table 2. Synthesis of descriptors searched in codes of professional ethics of health and social sciences

	Autonomy	Beneficence	Confidentiality	Informed consent	Research with human beings	Copyright
Geography	There is no reference	Article 6º	There is no reference	There is no reference	There is no reference	There is no reference
Physical education	Article 5º, item IV	Article 7º, item VI	Article 6º, item XIII	There is no reference	There is no reference	There is no reference
Nursing	Fundamental Principles and articles 1º e 36	Articles 21 and 94	Articles 81, 82, 83 e 98	There is no reference	Articles 89 and 94	Articles 88, 91, 99, 100, 101 and 102
Pharmacy	Article 11, item VIII	Article 12, item VII	Article 12, item V	Article 14, item XXVIII	Article 12, item XVI	Article 16, item II e V
Physiotherapy and Occupational Therapy	Article 8º; Article 14, item IV; Article 30, item VIII	Article 14, item IV	Article 9º, item IV; Article 15, item V; Article 32	Article 41, item II; Article 42	There is no reference	There is no reference
Medicine	Article 31; item 102, sole paragraph; items 105 e 110. Chapter I, item XXIII	Chapter I, item VI; Chapter III, Articles 1º, 32 e 102	Article 85; Chapter IX, Articles 73 and 78	Article 101	Articles 99, 100 and 101; Chapter I, item XXIV	Articles 107, 108 and 117
Nutrition	Articles 8º e 60	Articles 34 and 78	Article 20 (professional secrecy)	There is no reference	Article 79	Articles 82 and 83
Dentistry	Article 3º	Article 2º	Article 5º, item II; Article 9, item VIII; Article 49, item III; Article 14, 15 and 16	Article 50, item VI	Article 49, item VII; Article 50, item VI	Article 49, item IV
Speech and Language Therapy	Article 4º, item III; Article 5º, item II	There is no reference	Article 4º, item V e VI; Article 10, item XIII; Articles 23 and 24	Article 33, item V	Article 33, item VIII	Article 32, item III; Article 33, item IX e XI; Article 34, item IV and V
Psychology	There is no reference	There is no reference	Article 9º; Article 16, item c	Article 16, letter b	There is no reference	There is no reference

Discussion

As for scientific integrity, it could be verified that the research must be carried out based on the demands of priorities established by the scientific community and endorsed by the society in general. They should be developed observing ethical principles such as beneficence, autonomy, justice, confidentiality, privacy, legitimacy of data, transparency, among others. Relevant aspect relates to the correct indication of authorship and co-authorship as a way of preserving copyright. Their results should have social and scientific relevance, being directed to population groups with which the studies were carried out.

From the reading of previously selected scientific articles, it was found that the difficulties in adopting and maintaining principles related to scientific integrity and copyright are present in all continents, as evidenced by the countries of origin of the articles that deal with ethical transgressions: Brazil^{15,17}, China⁴⁵, United Kingdom⁴⁶, France⁴⁷, United States⁴⁸ and Africa⁴⁹.

Some aspects that hinder adherence to good scientific practices and the consequent integrity in science are conflicts of interest⁵⁰, dispute of authorship⁵¹ and various frauds, which are the main cause of retraction of articles by scientific journals¹⁰. Added to these deviant behaviours is the lack of knowledge about the content of professional codes of ethics and their omission with respect to the protection of vulnerable participants²⁸. In addition, few cases of scientific misconduct are effectively recorded, making it difficult to adopt educational and punitive measures⁴⁹.

It was also observed that there are factors that influence the reduced adoption of good practices or enable conducts considered questionable in the scientific context. The first one is associated with academic competitiveness and the requirement of intellectual production based on the quantity of scientific publications, to the detriment of the quality of the researches and their products¹⁶. Another point would be researchers' understanding of their work environment. Those who perceive the existence of unfair treatment or who work excessively are more prone to scientific misconduct⁵².

Another cited aspect that interferes in the process was the early access of students to the content of codes of professional ethics and the strength of these documents in the ethical-legal formation of professionals²⁸. Knowledge of ethical requirements for

the practice of professions contributes to empowering professionals in different categories.

Analysis of the current panorama of scientific practice shows that there are difficulties in preserving research integrity and dissemination of results. Nevertheless, it is possible to list progress made in some areas of knowledge, as well as measures adopted to solve the problems indicated. Ideally, professionals and researchers should adopt behaviours and practices anchored in ethical requirements throughout their careers⁵³.

Despite the incipient discussion on the subject in Brazil, it was possible to note the increase in the production of articles on scientific integrity from 2005¹⁵. With a view to responsible conduct in research, professional societies should carefully evaluate the needs and possible problems in their area and to offer resources to solve specific problems. In addition, they should play an active role in promoting integrity in research⁵⁴.

As for the authorship dispute, it is recommended to establish agreements prior to the production of research and scientific articles on the order of authorship and co-authoring to be adopted in the publications and the responsibility of each one of the participants according to legal requirements, in order to avoid problems in the publication and subsequent need for retraction. Ownership of ideas is a complex subject because it brings together issues such as intellectual property, professional ethics and scientific progress for author, society and country⁵⁵.

Final Considerations

This research showed that codes of professional ethics briefly address the ethical requirements that should support conducting research, dissemination of results and issues related to copyright. This is more frequent in the codes of ethics of the humanities, which reflects the lack of normative support for the professionals of the area. It is worth mentioning that this issue is important for both the health sciences professionals and the humanities.

In general, these codes have not provided adequate guidance regarding the development and publication of research, which goes against the provisions of international declarations, Brazilian legislation and regulations for the themes of research with human beings, scientific integrity and copyright.

The codes address principles of autonomy and beneficence aimed at everyday work practice, but do not emphasise the duties of the professional as a researcher and adherence to the values and principles required for scientific integrity. It should be emphasised that, besides exercising work activities, the professionals of the categories considered in this article are also academics and researchers. They

should, therefore, be guided by their professional councils regarding the ethical behaviour expected in the context of the scientific practice.

In this sense, this research sought to give subsidies so that councils and class societies can adapt their codes in order to emphasise the importance of the subject and enable its professionals regarding scientific integrity and copyright.

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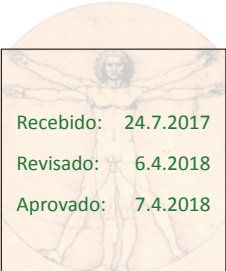
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