Scientific integrity in nursing

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Many nursing codes of ethics state or imply that nurses have a responsibility to conduct research in order to expand the profession's knowledge base; yet, few provide guidance on the ethics of research. An increasing number of nursing organizations are now turning their attention to this very task, in order to provide specific guidance to their members on sound practices in their research, and for the training of the new generation of nurse researchers. This article provides the rationale for why such guidance is needed, describes ethical principles underlying scientific integrity, and presents several of the most compelling topics in scientific integrity, namely those related to publication practices, collaboration, and institutional responsibility.
Descriptors: Nursing research, Nursing, Nursing ethics.

Integridade científica em enfermagem
Muitos códigos de ética em enfermagem afirmam ou pressupõem que as enfermeiras têm a responsabilidade de realizar pesquisas para expandir a base de conhecimentos da profissão; até agora, poucos orientam sobre a ética na pesquisa. Atualmente, um número cada vez maior de organizações de enfermagem está se voltando para essa difícil tarefa, fornecendo orientação específica a seus membros no que se refere à prática em suas pesquisas e o treinamento da nova geração de enfermeiros pesquisadores. Este artigo fornece a razão porque essa orientação é necessária, descreve os princípios éticos subjacentes à integridade científica e apresenta diversos dos mais persuasivos tópicos necessários na integridade científica, especificamente aqueles relacionados às práticas de publicação, colaboração e responsabilidade institucional.
Descritores: Pesquisa em Enfermagem, Enfermagem, Ética em Enfermagem.

Integridad científica en la enfermería
Muchos códigos de ética en enfermería afirman o implican que ella tiene la responsabilidad de conducir la investigación para expandir la base de conocimiento de la profesion; aunque, pocos orientam sobre la ética de La investigación. Actualmente un numero cresciente de organizaciones de enfermería se esta volviendo a ese tipo de tarea para fornecer orientación especifica a SUS miembros no que se refiere a la practica en sus investigaciones y para el entrenamiento de nueva generación de enfermeros investigadores. Este artículo fornece el motivo por que esta orientación es necesária, describe la integridad cientifica subyacente de los princípios éticos y presenta la mayor parte de los tópicos persuasivos en la integridad cientifica, especificamente aquellos relacionados a las practicas de publicación, colaboración y responsabilidad institucional.
Descriptores: Investigación en enfermería, Enfermería, Ética en enfermería.

INTRODUCTION

On the occasion of this new Brazilian journal, Nursing in Focus, it seemed fitting that the editors have chosen to present a paper on the ethics of doing science and scientific writing, which is now known by the term "scientific integrity." Nurses have historically been on the forefront of emphasis on ethical practice in nursing and health care. Thus, it is a natural extension that we give similar consideration to sound and ethical practices in research.

Most nursing associations worldwide have codes of ethics to guide the practice of their members. For example, the current nursing code of ethics in Brazil articulates important ethical principles, such as respect for human rights, dignity and other important considerations that are also reiterated in the International Council of Nurses' code of ethics. The country also has guidelines for research involving human subjects, such as review by an impartial committee to assure that ethical standards are observed in research. Editors in turn are expected to comply with certain guidelines, such as authorship declaration, statements regarding conflict of interest, and evidence of approval by research committees [if an article is based on research with human subjects].

Many codes of ethics state or imply that nurses have a responsibility to conduct research in order to expand the profession's knowledge base; yet, few provide guidance on the ethics of research. An increasing number of nursing organizations are now turning their attention to this very task, in order to provide specific guidance to their members on sound practices in their research, and for the training of the new generation of nurse researchers.

In the pursuit of truth and understanding, researchers and scientists are guided by several universal principles, regardless of discipline. These are: respect for the integrity of knowledge, collegiality, honesty, trust, objectivity, and openness.

The scientific integrity guidelines most commonly used by nurse scientists in the U.S. are those developed by the Midwest Nursing Research Society[1]; in developing this document, the committee appointed by the MNRS board of directors drew

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upon international documents and those of several disciplines. In a discussion such as this, a distinction needs to be made between ethical principles and practices from those that are legal rules. Although the ethical and legal intersect at times, the focus of concern here will be ethical issues; experience shows that even where an issue has a legal dimension, there is an underlying ethical concern. An example can be drawn from publication practices, where in some countries it is illegal to appropriate another's work as one's own, without attribution. This is a major ethical violation, and violates respect for the original author/investigator, by appropriating another's work as one's own without giving appropriate credit, and involves deception as well. Yet, it needs to be recognized that ethical standards are higher than legal ones; it is for this reason that many professional organizations and institutions have put in place mechanisms for monitoring and dealing with violations of ethical codes and codes dealing with the conduct of science, since some ethical violations may not be illegal. An example of this kind is manipulating one's data in such a way that it supports one's biases. Such a practice may not be illegal, but it is unethical, as it distorts science and misleads other investigators. This approach for dealing with ethical violations accords with the duties of professional organizations, as they are expected to set higher standards for their members than the legal system does.

"It needs to be recognized that ethical standards are higher than legal ones"

Our awareness of important ethical principles and practices in conducting research has been heightened by public discussions of scientific misconduct by scientists, in some cases individuals and teams that were held in high public esteem. Such incidents by a few undermine the entire scientific enterprise, the public trust in the scientific process, the individuals who engage in science, and the product of their work. In many countries, governments are the primary funders of scientific work; in order to assure scientific integrity, many have put rules and regulations in place to assure that both the process of conducting research and the scientific findings themselves are sound, with the institutions where research is carried out assuming the responsibility for overall monitoring and compliance.

Currently, many of the governmental rules pertain to the protection of human and animal subjects, laboratory safety, privacy regulations, handling of toxic materials used in research, avoidance of conflict of interest, and others. Many of these have come to be legal obligations of governments and institutions sponsoring research. On the other hand, the goal of scientific integrity guidelines by professional organizations is "to promote the integrity of nursing science by integrating principles of science and ethics, and to enhance the sense of social responsibility of scientists" [1], suggesting a broader view of what is entailed than the strictly legal obligations.

Why do we want science to be ethical? There are several reasons: We want to have confidence in the validity of knowledge; to serve the public good; promote public trust in the work of scientists; demonstrate good stewardship of public funds; and lastly, because it is the right thing to do. Several ethical principles are embedded in the ethical conduct of science. They aim to assure that science and scholarly knowledge are accurate and valid, and they protect intellectual property rights of all concerned [1].

Broadly speaking, research is considered ethical when it: has or promises to have scientific value; has scientific validity, i.e., it is soundly conceived and designed; incorporates fair treatment and selection of subjects; has favorable risk-benefit ratio, i.e., overall benefits outweigh the risks; protects the rights, dignity, autonomy, privacy and confidentiality of research participants; has undergone independent review, such as by an institutional review board; incorporates the voluntary and informed consent of subjects; and, protects subjects from harm[2]. It is now the case that most scientific journals in the U.S. will not publish research reports that do not meet these ethical standards.

RELEVANT ETHICAL PRINCIPLES

Several key ethical principles that have relevance in nursing research are presented in brief.

Autonomy

Autonomy requires that there is liberty and agency, with both freedom and capacity for intentional action, and where the person/agent has capacity for self-governance. The concepts of privacy, confidentiality, and voluntarily giving consent reflect the principle of autonomy.

Non-maleficence and beneficence

These are distinct but inter-related principles. The edict "we ought not to inflict harm" reflects non-maleficence and takes precedence over those of beneficence; the three edicts which are arranged in a hierarchy are: we ought to prevent harm; we ought to remove harm; we ought to promote good. Specific guidelines in human subject protection, such as in weighing the risk-benefit ratio of a given study, reflect these two principles.

Justice

Justice has many meanings, but those relevant in this context are fairness, equitableness and appropriateness, such as in distributing benefits and resources (known as "goods"). In a research context, as we weigh the question of who will benefit from the research, and how the risks and benefits are to be weighed address the principle of justice.

TOPICS IN SCIENTIFIC INTEGRITY

The typical headings covered within scientific integrity are: data stewardship and access; data collection, management and analysis; protection of rights and safety of human subjects; publication practices, including authorship, peer review, and journal editor responsibility; collaboration between peers, and between faculty and students; conflict of interest; institutional

responsibility; and professional association responsibility. We will specifically address only publication practices, collaboration, and institutional responsibility. All discussion below is based on the MNRS document Guidelines for Scientific Integrity, second edition (2002), unless indicated otherwise [the author chaired the committee that developed these guidelines]. The American Medical Association publication AMA manual of style provides greater detail on scientific integrity as well as serving as a style guide for their publications[3].

Publication practices

Professionals have an obligation to write and disseminate their works to the wider communities they serve. Whether their work entails research, or sharing of educational, practice, service or policy innovations, we need to write and disseminate the information so that our colleagues, students and others may benefit from our work, and build on what we do, thus contributing to the advancement of nursing and the development of nursing science. There are different types of publications, to be sure, and for that reason, there are multiple types of journals that focus on various areas of nursing, or serve different constituencies and groups within the profession. As well, given the growing complexity of nursing, we see an increasing number of projects that are conducted collaboratively in teams, with members of different faculty ranks and status that might include students, practicing nurses, consultants, members of other disciplines, etc. This reality requires that we have a clear understanding and standards as to how to recognize and acknowledge contributions of different members. In this light, it is important to address issues related to authorship.

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Authorship

Authorship brings prestige and recognition to individuals, and provides them a variety of professional and personal rewards. For example, increasingly, promotion of faculties and others have come to be dependent on publications; further, the expertise of individuals is demonstrated and becomes known to the wider professional community as a result of their published works, which can lead to invitation for consultations, speaking engagements, government work, and the like. Thus, listing of individuals as authors should have clear meaning, and should indicate those who have contributed substantively to a work, can take public responsibility for the outcome of a project, and defend the work publicly if challenged. There are no quantifiable recipes for how substantive work and assumption of responsibility can be defined, but some guidance can be provided. Until several decades ago, guidance was not available, as we had not thought through these issues, and various teams used their judgments to arrive at who was to be included as author, and in what order. More recently, many professional organizations have developed guidance for their members. An important group that has provided leadership in this domain has been journal editors; many journals now include their own authorship criteria in their "author guidelines." While there may be some disciplinary variations, there are many similarities among them as well.

Thus, there is much similarity about the general meaning of "substantive contribution." In nursing, it has come to mean that individuals who assume responsibility for at least two, preferably more, of the following areas: conception and design, execution of the project or study, analysis and interpretation of data, preparation and revision of the manuscript[1]. These and other guidelines are written in terms of research. For other types of writing, it has to be "translated" to meet the demands of the project at hand. A guideline is not a recipe, thus teams need to discuss their work, the roles and responsibilities of participants and come to specific agreements. This is most certainly the case in the determination of the order of authorship. Some disciplines might have the most senior person, or the person who heads the project listed as the first author, while others might place such an individual as the last author. In other cases, authors might be listed in alphabetical order. In nursing, the implicit practice has been that if a collaborative team is producing several papers from their project, different team members might be assigned to be the lead on a paper, thus serving as first author, with others participating in various ways. Other approaches have been used as well for determination of the authorship order.

Additional guidance is provided in the MNRS document[1], as follows:

a) The individual who heads a team assumes overall responsibility for all publications that come out of a project, and provides leadership, even if that person is not an author on a given publication;

b) In order to prevent discord among members, members discuss in advance the roles and responsibilities of members, and how authorship and ordering will be allocated; should the actual plan vary from that which was planned, the team should discuss the changed situation and make a collective decision accordingly;

c) Titles, positions or status of individuals cannot be considerations in authorship determination; a sensitive area may be related to students who participate on faculty teams. While they are in a learning mode, should their contribution fulfill authorship criteria, they should be so acknowledged and listed. In some institutions or disciplines doctoral students are required to have several publications during their student careers, and participation on collaborative teams affords them the opportunity to learn to function in teams, learn about authorship, while meeting their academic requirements;

d) All authors should review and approve the manuscript and participate in any revisions;

e) Duplicate publications are to be avoided. This is a contentious issue; some might argue that only one paper should be

published from a project. Others disagree, in that some projects are highly complex, and it is entirely possible to generate several manuscripts without fragmenting or duplicating the material. As well, there may be occasions when material is relevant for practicing nurses, but is highly technical, rendering the content difficult for non-researchers to understand; this would be another instance where a different article may be prepared for a journal that practicing nurses are more likely to read.

f) Should editors request additional information on contribution of members, or research data, or any previous works that may be similar to the current paper, authors have a responsibility to provide the requested information.

Journal editor responsibilities

Editors are the gatekeepers in that they determine the scientific material that gets published, and as such, have critical roles in the publication process. They demonstrate fairness and lack of bias at all stages of the publication process; they select, monitor, and clarify the peer review process and orient new peer reviewers to the process; they provide clear information to prospective and actual authors, peer reviewers and they use the journal's published author guidelines with consistency; they assign appropriate individuals to review manuscripts, selecting those who have both subject expertise and who do not have any conflict of interest; they observe legal guidelines required by publishers; they are timely in responding to authors as to manuscript disposition, and provide meaningful input in a collegial manner, to enable authors to improve their work; and, they publish corrections for any errors that are discovered, providing revisions if appropriate. Journal editors also make clear to authors if they do not wish them to either present the work publicly prior to publication or share them with the media[1].

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Peer review

Peer review is the most widely accepted approach used for evaluation of the quality of scientific works; this is the system used for manuscript evaluation by many, though not all, journals. The journals that use the peer review process are more highly regarded as venues for sound scientific publications than journals that do not use peer review. This system is also used by academic and other institutions for evaluation of personnel, grant evaluation, and competitive awards. Thus, attention needs to be paid by all concerned that peer review is objective, and biases are minimized as much as possible. For this reason, journals that use this system do it on a "blinded" basis, whereby the reviewer does not know who the author is, and authors do not know who the reviewers were on their manuscript. Peer reviewers need to use the highest current standards in the field in evaluating manuscripts, they maintain confidentiality, and do not reveal the content to anyone prior to publication, they avoid conflict of interest, and if any conflict or bias is present, they inform the editor so s/he can make a determination if the conflict presents sufficient bias that might compromise the quality of the review. Reviewers follow the established policies of the journal, and provide comments that are timely, constructive and collegial[1].

Collaboration

As emphasis has increased on intra- and inter-disciplinary collaboration through large scale projects, it has become important to form teams with members possessing complementary expertise. Thus, it becomes important for teams to establish guidelines for how the team members will function, and clarify their roles and responsibilities. Teams tend to have members from different disciplines, career stages, with both senior and junior members as well as students and trainees. Thus, it is the responsibility of senior members to assist in the development of junior members of the team by providing those learning opportunities through their mentorship and role modeling.

While the principal investigator has overall responsibility for a project, teams should determine, at the start of a project, what the members' roles, responsibilities and obligations are. Collegiality, respect for each member, and transparency/openness should characterize relationships and working climate. Members should hold themselves and each other accountable to the team and to the project.

Faculty-student collaboration

Faculty members are expected to provide mentorship to students, and assist them in acquiring the values of science and that of the discipline, and help them to learn the subject matter and methods of the topic under investigation. As this relationship is implicitly a power relationship, it is a sensitive one for students, and therefore, faculty should be aware of this. When students are team members, it is important to clarify if their role is as employee or as student, as expectations might vary somewhat. Therefore, parties should have an open discussion of why the student is on the team, and what is expected of her/him. One of the areas to be discussed is the student's role on any publications, and what authorship means, and to make the student familiar with authorship criteria. The criteria for authorship should be the same as previously discussed. For example, if the student envisions participating in the project that might lead to her/his authorship, s/he needs to be aware from the outset the required level of involvement in the project that would be sufficient to justify authorship, as this cannot be addressed after the fact. Authorship decisions are not related to employment status, and time and effort by themselves do not justify authorship, unless the nature of the contribution is substantive, and the student is able and

prepared to assume overall responsibility for the part of the project on which s/he is to be listed as author.

INSTITUTIONAL RESPONSIBILITIES FOR PROMOTING SCIENTIFIC INTEGRITY

Most research is conducted within institutions large and small, whether these are educational, health care, and governmental or other types of institutions. Given this, they have overall responsibilities which cannot be transferred to others. They are accountable to the public and agencies that fund the research to assure that sound practices and oversight is used in expending the funds and in conducting the research. This can typically be done by the establishment of clear policies and setting the expectation that all projects must conform to those policies. The leadership of an institution should signal from the highest level as to the value placed on sound science and established practices. Institutional responsibilities include, but are not limited to the following areas: assuring that all researchers have appropriate training in responsible science; assure that human subjects of research are protected from physical and other harm, and their rights are respected and protected; when animal subjects are used, that appropriate procedures are followed for humane treatment; assure that researchers avoid conflict of interest to assure the objectivity of science; and generally create an institutional climate that promotes good practices. Institutions are also responsible for monitoring, investigating and reporting any misconduct or untoward consequences to research subjects and for taking appropriate action.

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