

Postgraduate nursing students' knowledge of research misconduct

Conhecimentos dos estudantes de pós-graduação em enfermagem sobre má conduta em pesquisa

Conocimiento de estudiantes de postgrado en enfermería sobre la mala conducta en la investigación

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ABSTRACT

Objective: to examine postgraduate nursing students' knowledge of research misconduct. **Method:** this exploratory, qualitative, descriptive study, guided by the criteria of the Standards for Reporting Qualitative Research: a synthesis of recommendations, considered 40 master's and doctoral students at a public university in southern Brazil. Data were collected through semi-structured interviews, in October 2020, using a synchronous application, and treated by textual discourse analysis. The study was approved by the research ethics committee. **Results:** two categories emerged: "Scientific integrity versus misconduct: determining factors" and "Types and definitions of misconduct". **Conclusion:** postgraduate students have cohesive knowledge of the severity of inappropriate behavior in scientific research and of the harmful consequences of such conduct, contemplating an abstract domain when related to questions of morality and integrity and their absolute inversion.

Descriptors: Education; Science; Ethics, Research; Scientific Misconduct; Students, Nursing.

RESUMO

Objetivo: analisar os conhecimentos dos estudantes de pós-graduação em enfermagem sobre má conduta em pesquisa. **Método:** estudo qualitativo, descritivo e exploratório, norteado pelos critérios do *Standards for Reporting Qualitative Research: a synthesis of recommendations*, realizada com 40 estudantes de mestrado e doutorado, de uma universidade pública situada no Sul do Brasil. Os dados foram coletados por intermédio de entrevistas semiestruturadas, em outubro de 2020, com a utilização de aplicativo síncrono, os quais foram submetidos à análise textual discursiva. O protocolo de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa. **Resultados:** emergiram duas categorias: Integridade científica versus má conduta: fatores determinantes e Tipos e definições de má conduta. **Conclusão:** Os pós-graduandos possuem conhecimento coeso relacionado à gravidade dos comportamentos inadequados nas pesquisas científicas, bem como as consequências nocivas advindas dessa conduta, contemplando um domínio abstrato quando relacionado às questões de moralidade e integridade e sua absoluta inversão.

Descritores: Educação; Ciência; Ética em Pesquisa; Má Conduta Científica; Estudantes de Enfermagem.

RESUMEN

Objetivo: analizar el conocimiento de los estudiantes de postgrado en enfermería sobre la mala conducta en investigación. **Método:** investigación cualitativa, descriptiva y exploratoria, guiada por los criterios de los *Standards for Reporting Qualitative Research: a synthesis of recommendations*, realizada junto a 40 estudiantes de máster y doctorado de una universidad pública ubicada en el sur de Brasil. Los datos fueron recolectados a través de entrevistas semiestructuradas, en octubre de 2020, utilizando una aplicación síncrona, y después sometidos a análisis textual discursivo. El Comité de Ética en Investigación aprobó el protocolo de investigación. **Resultados:** surgieron dos categorías: Integridad científica versus mala conducta: factores determinantes y Tipos y definiciones de mala conducta. **Conclusión:** Los estudiantes de postgrado tienen conocimientos cohesionados con respecto a la gravedad de las conductas inadecuadas en la investigación científica, así como las consecuencias nocivas derivadas de esas conductas, contemplando un dominio abstracto cuando relacionado con cuestiones de moralidad e integridad y su inversión absoluta.

Descritores: Educación; Ciencia; Ética en Investigación; Mala Conducta Científica; Estudiantes de Enfermería.

INTRODUCTION

Research misconduct refers to inappropriate behavior, including fabrication, falsification, and plagiarism^{1,2}. A collective search for ethical behavior and the reliability of publications is essential¹. Scientific fraud emerges from two conditions: the first refers to the partial or total fabrication of data that make up a scientific product, and the second consists of falsifying or manipulating methodologies or statistics that tend to culminate in a given desired result³. Such a practice is a delicate matter challenging to manage, which does not remain restricted to the scientific milieu; the impacts arising from research misconduct reflect on the social environment and community⁴.

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There seems to be a connection between research misconduct and pressure to produce journal publications, corrupting aspects that are indispensable for the integrity of scientific research^{5,6}. However, academic frauds reflect more than legal and penal issues. They reveal a failure in training students to be moved by critical-reflective reasoning, capable of creating their own ideas within transparent science⁷. Thus, the importance of research based on solid development criteria⁸ is highlighted, as well as the relevance of graduate studies for guiding students regarding research misconduct and its impacts on science developed in universities.

There is a need to identify the concept of research misconduct from the students' perspectives. Identifying knowledge on the subject favors a productive dialogue in the context of graduate studies. Additionally, it unveils critical educational gaps, enabling devising and implementing actions to improve the training of researchers and professors to perpetuate good research practices, evidencing this study's relevance. Thus, the following research question was established: what is the knowledge of graduate nursing students about research misconduct?

In this context, this study's objective was to identify the knowledge of graduate nursing students regarding research misconduct.

METHOD

This study comprises a qualitative, descriptive, and exploratory analysis guided by the Standards for Reporting Qualitative Research: a synthesis of recommendations (SRQR)⁹. The study setting was the nursing graduate program of a public university in southern Brazil. The Coordination for the Improvement of Higher Education Personnel (CAPES) currently rates the program with grade 5. It has 101 students, 42 of whom are Master's students and 59 doctoral students, supervised by 15 professors. The graduate program was approved in 2001 and began its academic activities with a Master's and a Ph.D. program in 2002 and 2009, both authorized by CAPES.

Data were collected in October 2020 from 18 Master's and 22 doctoral students selected by non-probabilistic convenience sampling. The inclusion criterion was being a regular Master's or doctoral student in 2020. Students on maternity or sick leave and those who withdrew from the program were excluded.

A semi-structured interview was used to collect data. The questions addressed the students' understanding of integrity and misconduct in the production of science in the graduate academic milieu. A synchronous application was used in the online interview, which lasted 30 minutes on average.

The discursive textual method was used in data analysis using three steps: unitarization, categorization, and communication. In the first stage, the material was read in-depth to capture units of meaning, listed according to the study's objective, in the unitarization process. Next, the relationships between the units of meaning were categorized to summarize information. In the last stage, the authors interpreted the message supported by bibliographic references, culminating in the process of communication or presentation of a new understanding¹⁰.

The study protocol was submitted to and approved by the Institutional Review Board. Note that the participants received clarification regarding the free and informed consent form, which was provided online, ensuring the participants' autonomy and confidentiality. In addition, the participants' identities were preserved by using the initials M (Masters) and Ph.D., followed by a number that corresponded to the year in which the respondent was enrolled in the program (M1 or M2 and PhD1 to PhD4) and a number that corresponded to the order in which the interview was held.

RESULTS

Two categories emerged: Scientific integrity *versus* misconduct: determining factors and Misconduct definitions.

Scientific evidence *versus* research misconduct: determining factors

This category reflects the students' understanding of how scientific dishonesty is diluted in the scientific universe. *A priori*, the impact of misconduct in health research is highlighted, showing that the understanding of misconduct can be directly related to the inversion of integrity, determining two opposite concepts:

[...] two separate things: integrity and misconduct, [...] are opposites. If I'm saying that my research has integrity, my study is in agreement with scientific integrity; hence, I can't err by misconduct. (PhD4.1)

Regarding misconduct in investigative practices in the health field, students are afraid of such a matter as it represents a threat to the scientific environment and society from an integral perspective.

[...] in terms of health, I think it is even more serious because of that, because we deal [...] with lives and manipulated results may harm someone's life. (PhD4.2)

[...] the moment I assume this behavior and responsibility, which is not just in the face of an ethics committee, it's not just in the face of the university, I believe that we have to think that it is in the face of society. (PhD1.6)

In this context, the students highlight that apparently minor transgressions are trivialized and contribute to a cycle of dishonesty, promoting corrupt and poor-quality science:

[...] I think that misconduct in graduate and undergraduate programs starts when you take the homework or paper of a colleague attending a semester ahead of you and replace a few words and put your name on it. (PhD1.1)

Three different perspectives can be adopted to analyze the determining factors of scientific misconduct. Initially, elements related to scientific immaturity, competitiveness, and productivism are considered:

For me, there's a lack of preparation [...] since university, high school. Brazil, as a whole, does not prepare students for research, so in my opinion, this is what leads to plagiarism, having scientific articles plagiarized. (M2.10)

[...] the system itself pressures people to produce, [...] because of this pressure, it can even interfere how a person does research. (M2.5)

Graduate studies can promote the students' maturity as researchers, considering that more solid clarification is provided in the teaching-learning process. Therefore, from the students' perspective, research misconduct permeates multiple aspects, alternating misconduct and unintentional practice, reinforcing the relevance of educational opportunities for graduate students to develop scientific knowledge.

[...] sometimes plagiarism happens due to a student's ignorance of not knowing what it is because it was not taught in the academic environment. (PhD3.2)

[...] I think self-plagiarism is a complicated matter because when you're submerged in a given subject, it's automatic; it's very complex because you have your way of writing. You use that, reproducing it in all the other works, and when you realize it, you're talking about it, you're incurring self-plagiarism. (PhD2.6)

The second perspective refers to elements of a subjective nature, related to the premises of morality and individuality, taking into account moral values, biased conduct, and academic vanity:

[...] Corruption in research, I think, involves the researcher's character, and I think it is a problem of a researcher's lack of ethics. It has to do with who you are and how you perform your work. (M2.8)

Research misconduct is when a researcher violates certain ethical principles to benefit from his or her research or gain recognition [...] by doing research for the sake of a career. (M1.3)

The third perspective refers to gaining financial or commercial advantages involving natural persons, legal entities, or even institutions, which consistently represents a conflict of interest, as shown below:

[...] sometimes research involves government ambitions that change results, sometimes according to a policy [...] or interests that research provides a given result. (PhD1.2)

Misconduct definitions

This category includes the graduate students' conceptual perception of scientific dishonesty. The perceptions of plagiarism and self-plagiarism are perceived, highlighting ideas of how severe plagiarism can be and its concepts; an expressive number of individuals considered plagiarism more severe than self-plagiarism.

[...] plagiarism is more severe because you are copying someone else's ideas, you are copying someone else's work or review, or an article that has already been written by someone who's worked hard to write it. (PhD2.4)

It is also noteworthy that digital tools, such as anti-plagiarism software, can mitigate such behavior, but they become obsolete, allowing more frequent misconduct.

[...] it becomes clear that plagiarism is not only copying a paragraph [...] it means copying an idea [...] there are programs that allow me to take an article you wrote and translate all the words that will never be linked to each other and yet I'll be saying the same thing. (PhD1.3)

However, at times, students manifest doubts and hesitation regarding the characterization of self-plagiarism, allowing us to infer that the relationship between these concepts is not fully comprehended by graduate students:

Regarding self-plagiarism, I'm also a little confused about what it would be in the sense that, for example, when I cite myself on a paper, how I put myself in that work, I'm a little confused about plagiarism and self-plagiarism. (PhD2.2)

Regarding data falsification, perceptions were unanimous regarding how severe falsification is. Many participants also related misconduct to researchers' ethics as professionals and the configuration of a transgression both from a criminal and social perspective.

When this happens in research involving public health, it is even more severe because it involves human beings, health practices, teaching, and research on health protocols and public policies. Anyway, it's something very uncomfortable, and in my opinion, it's a crime. (PhD3.1)

There is evidence of a conception characterized by modified information, either by changing the reports of a study's participants or measurements or indices, presenting unsubstantiated inferences, or total or partial tampering, reinforcing an understanding of how severe are all forms of falsifications. Another aspect concerns the relationship of misconduct with obtaining convenient results to meet the most varied interests.

Data falsification is when I introduce data, [...] to facilitate my analysis process, to facilitate my results, or to obtain desired results. (PhD3.5)

Data falsification can be simple multiplication [...], like you survey ten individuals and say you surveyed 100 and keep the proportion. (PhD1.3)

Doubts and different concepts emerged regarding authorship, emphasizing the notion that a paper has a single mentorship so that one researcher receives the first author credits and co-authors receive secondary authorship. In addition, there is a perspective of collective construction of knowledge, enabling the division of copyright credits:

[...] even if there are other people to help me out, the key to a given study, the person responsible for it is me, so I have its authorship. (PhD2.4)

[...] What we see today in practice is that authorship is often shared, or it is shared with the advisor when one is on his/her way to a master's or doctoral degree. In some cases, it happens less often, and in other cases more often. (PhD2.2)

Another relevant aspect concerns the effective and relevant participation of people in publications, associating this concept with misconduct when related to the unfair treatment of each co-author's contributions:

[...] there are a lot of people who end up including people as co-authors when these people didn't even participate in a given paper. This person revised the Portuguese, but someone else helped put the paper together, but it is not quite like that. (M1.1)

DISCUSSION

Research misconduct concerns concrete, intentional or biased actions characterized by irresponsibility, omission, recklessness, disregard for relevant regulations, and directly or indirectly fraudulent conduct during investigations¹¹. The graduate students' understanding of scientific dishonesty shows that literal knowledge of the concept indicates that misconduct is opposed to integrity.

Regarding the severity of these behaviors, the analysis shows that the participants consider misconduct severe, considering its consequences that impact science and society. However, scientific corruption may partially arise from a lack of reflection on the importance of ethics in investigative practices. Therefore, it is essential to intensify debates and implement educational strategies to perpetuate ethics in scientific research¹².

However, “little transgressions” may become trivialized in the routine of academic life and, even though they may go unnoticed, cannot be ignored. From the students’ perspective, these behaviors encourage intermittent misconduct, deteriorating scientific practices. There were indications that the triggers for dishonest practices may emerge based on three different aspects; the first is related to the academic domain.

As a propellant of science, the academic environment imposes considerable pressure on researchers^{6,13}. Accelerated production of scientific articles and materials intended to meet demands often indirectly results in academic disasters, such as plagiarism and self-plagiarism. Although the latter is seen to be legally different from the first, it is still characterized as scientific dishonesty⁶. It is noteworthy that the participants frequently reported academic productivism as being related to factors that determine misconduct.

Thus, a researcher’s technical-scientific competencies and the consolidation of appropriate conduct become essential for the effectiveness of investigative processes. In addition, disregarding this normative behavior erodes a researcher’s commitment to science and peers, harming the scientific universe and society, partially represented by plagiarism, self-plagiarism, data fabrication, and undue credits¹⁴.

Furthermore, this category highlights the importance of educational dynamics in guiding and correcting misconduct. Dialogues strengthened by integrity considerations are indispensable. In summary, dishonesty in the academic milieu enables in-depth analyses within training environments, favors integrity in science, and the fight against fraudulent practices¹⁵.

The training context is crucial for researchers and students to exercise practices and strengthen scientific knowledge, contributing to developing critical and competent professionals and promoting science’s ethical production^{7,16}. The importance of studies addressing good scientific practices is reinforced to promote ethics in the scientific field^{16,17}.

The second aspect refers to honesty and morality and their relationship with misconduct, which is imbued with vanity and egocentrism. Note that the motivations that culminate in scientific misconduct may have subjective origins based on egocentrism and individuality¹⁸. Regarding conflicts of interest, the term can be defined as a situation in which priority objectives are susceptible to influences, to the desire to obtain secondary benefits, of a personal or monetary nature, for instance, diverging from the original purpose^{19,20}. This matter was listed in the third aspect, and the graduate students noted that such an issue has the potential to determine misconduct.

The second category concerns the students’ understanding of different types of dishonesty in science. Among the conceptualized misconducts are plagiarism, self-plagiarism, data falsification, and undue authorship. Besides being superficial replicas, plagiarism also concerns the usurpation of key messages²¹.

Regarding plagiarism, a considerable portion of the participating students holds a more complex concept of it. Hence, plagiarism is not restricted to a verbatim copy of a given original manuscript but concerns the usurpation of an idea developed and published by someone else without assigning proper authorship, corroborating the literature. However, some students hesitated or were uncertain about clearly expressing the distinctions between plagiarism and self-plagiarism. The concept is challenging to interpret and requires reflection. Thus, knowledge about it must be disseminated so students can organize and clearly define what is characterized as scientific plagiarism and what is not. In this context, libraries are relevant in the academic milieu²².

Therefore, self-plagiarism is conceptualized as reusing papers written by the same author in different situations, giving them unprecedented legitimacy and omitting references to previous publications and disclosures. Plagiarism, on the other hand, is characterized by the transcription of texts without citing the source or copying the primary message to obtain a different interpretation, wrongfully taking someone else’s theory¹⁴.

The conception of data falsification is homogeneous among the students, especially regarding the impacts of misconduct on science. The participants associated it with principles inherent to an individual as a person and professional. The reports mention the vulnerability of studies with an emphasis on qualitative approaches; however, in this case, misconduct can also be related to aspects that concern personal integrity.

In the meantime, fabrications or inventions as scientific dishonesty are characterized by the publication of misleading data and/or content masked by non-existent veracity. Falsification, on the other hand, involves tampering with information, instruments, and/or materials or concealing or subtracting essential information from the investigative product^{2,14}.

Regarding authorship, most students understand the definition related to the shared exchange of knowledge and effective contributions, whether operational or intellectual. Although reports assign a paper's authorship directly to its primary author, the idea of a hybrid conception is corroborated, not relating authorship exclusively to a single person. Among the modalities of ethical offenses involving copyrights^{23,24}, including the names of people who did not provide a substantial contribution to the scope of a scientific paper, is highlighted, a situation that may be relatively common in the academia²⁵. Furthermore, ghost authorship can be configured as a situation in which the intellectual authorship of scientific material is not intended for the author who contributed most significantly²⁶. In short, the merit of authorship is justified by substantial involvement in the development of scientific material, such as, for example, in the organization of information and technical-scientific reviews, as well as in sharing responsibility for the content developed, among others¹⁹.

It is essential that educational institutions and researchers organize guidelines for the definition of authorship and mechanisms that mitigate transgressions, in addition to disciplines addressing ethics within the academic development of students, to contribute to their understanding of the topic, and have a clear understanding of the authorship concept in the production of knowledge²⁷.

Study limitations

Generalizations are impossible because perceptions are inherent and specific to the study setting; further research is needed. This study is expected to promote discussions to re-signify knowledge and mitigate misconduct, promoting the development of researchers aware of the importance of quality science for themselves and the world.

CONCLUSION

An analysis of the graduate students' knowledge implies the emergence of a concept supported by a set of interconnected dimensions whose effects on research are related to internal and external elements of the academic sphere. Such an understanding enables us to infer that knowledge about misconduct reflects determining factors from multiple sources and that subjectivity contributes to such understanding.

Note that the literature corroborates the knowledge of most of the participating students regarding misconduct. However, it permeates an abstract domain related to morality and integrity and the inversion of these values. This analysis reveals that graduate students have a cohesive knowledge of how severe inappropriate behavior in scientific research is, as well as the harmful consequences of this conduct.

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