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ORIGINAL ARTICLE

KNOWLEDGE, SKILLS, AND ATTITUDES OF POSTGRADUATE NURSING STUDENTS REGARDING SCIENTIFIC RESEARCH

CONOCIMIENTOS, HABILIDADES Y ACTITUDES HACIA LA INVESTIGACIÓN CIENTÍFICA DE ESTUDIANTES DE POSGRADO EN ENFERMERÍA

CONHECIMENTOS, HABILIDADES E ATITUDES RELACIONADOS A PESQUISA CIENTÍFICA DE ALUNOS DE PÓS-GRADUAÇÃO EM ENFERMAGEM

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ABSTRACT

Objective: To describe the knowledge, skills, and attitudes that students of a postgraduate program in Critical Care Nursing at a private institution in the Autonomous City of Buenos Aires have regarding scientific research, in the first semester of 2023. **Methodology:** Descriptive, cross-sectional, and quantitative study with a purposive sample of 43 postgraduate nursing students. Two instruments were implemented and validated between March and April 2023, designed for the self-assessment of research skills and to evaluate the perceptions of the process of teaching and learning about research. A descriptive and inferential analysis was conducted using the Infostat software. Informed consent was obtained from the participants, and no personal data were collected. **Results:** The mean age of the respondents was 34.14 years, who were in their majority women, single, without children, and had 8.98 years of work experience. The attitudes and skills that received the worst evaluation were the limited approach to research in the curriculum and the knowledge of statistical analysis, while the best evaluated were the link of research to the profession and interpretation of results. Although 48.84% reported participating in research activities, only 6.98% had published a scientific article. **Conclusions:** An overall positive perception of scientific research was found, while the self-assessment of research knowledge and

skills was moderately adequate. Gender, age, and professional seniority correlated with the participants' knowledge and skills regarding research.

Keywords: Nursing Research; Education, Nursing, Graduate; Knowledge Management for Health Research; Nursing Education Research.

RESUMEN

Objetivo: Describir los conocimientos, habilidades y actitudes hacia la investigación científica de los estudiantes del posgrado en Enfermería en Cuidados Críticos de una institución privada de la Ciudad Autónoma de Buenos Aires en el primer semestre del 2023. **Metodología:** Estudio descriptivo, transversal y cuantitativo. Con una muestra intencional de 43 estudiantes de posgrado de Enfermería. Se implementaron y validaron dos instrumentos diseñados para la autoevaluación de las habilidades investigativas y la evaluación de las percepciones hacia el proceso de enseñanza y aprendizaje de la investigación; durante los meses de marzo a abril del 2023. Se realizó un análisis descriptivo e inferencial utilizando el software Infostat. Se implementó el consentimiento informado y no se recolectaron datos filiatorios. **Resultados:** Los encuestados tuvieron una media de edad de 34,14 años, y fueron mayormente mujeres, de estado civil solteras, sin hijos, y con 8,98 años de experiencia laboral. El escaso abordaje de la investigación en el plan de estudios y los conocimientos en análisis estadístico, fueron las actitudes y habilidades con peor valoración, mientras, la vinculación de la investigación con la profesión y la interpretación de resultados, fueron las actitudes y habilidades mejor evaluadas. Si bien el 48,84% reportaron haber participado en actividades de investigación, solo el 6,98% han publicado un artículo científico. **Conclusiones:** Se halló una valoración mayormente positiva hacia la investigación científica, mientras, la autoevaluación de conocimientos y habilidades para investigar fue medianamente adecuada. El sexo, la edad y la antigüedad profesional mostraron relación con los conocimientos y habilidades para investigar.

Palabras clave: Investigación en Enfermería; Educación de Postgrado en Enfermería; Gestión del Conocimiento para la Investigación en Salud; Investigación en Educación en Enfermería.

RESUMO

Objetivo: Descrever os conhecimentos, habilidades e atitudes frente à pesquisa científica de estudantes de pós-graduação em Enfermagem em Cuidados Críticos de uma instituição privada da Cidade Autônoma de Buenos Aires no primeiro semestre de 2023. **Metodologia:** Estudo descritivo, transversal e quantitativo. Com amostra intencional de 43 estudantes de pós-graduação em enfermagem. Foram implementados e validados dois instrumentos concebidos para autoavaliação de competências de investigação e avaliação de perceções relativamente ao processo de ensino e aprendizagem de investigação; durante os meses de março a abril de 2023. Foi realizada análise descritiva e inferencial por meio do software Infostat. O consentimento informado foi implementado e nenhum dado de afiliação foi coletado. **Resultados**: Os entrevistados tinham idade média de 34,14 anos, sendo em sua maioria mulheres, solteiras, sem filhos e com 8,98 anos de experiência profissional. A escassa abordagem da investigação no currículo e os conhecimentos em análise estatística foram as atitudes e competências com pior avaliação; enquanto a ligação da investigação com a profissão e a interpretação dos resultados foram as atitudes e competências mais bem avaliadas. Embora 48,84% tenham relatado ter participado de atividades de pesquisa, apenas 6,98% publicaram um artigo científico. **Conclusões:** Foi encontrada uma avaliação maioritariamente positiva da investigação científica, enquanto a autoavaliação de conhecimentos e competências de investigação foi medianamente adequada. Sexo, idade e antiguidade profissional apresentaram relação com conhecimentos e habilidades de pesquisa.

Palavras-chave: Pesquisa em Enfermagem; Educação de Pós-Graduação em Enfermagem; Gestão do Conhecimento para a Pesquisa em Saúde; Pesquisa em Educação de Enfermagem.

INTRODUCTION

Nursing professionals play an important role in healthcare, by caring for patients, families, and communities, both in health and illness.[1] The essence of the nursing profession has changed over time, going from a task-focused role to a discipline based on scientific knowledge, with several areas beyond healthcare, including healthcare and nursing services management, teaching, and research. This study focuses on the latter.[2]

Scientific research plays a fundamental role in the advancement and development of any discipline, including Nursing.[3] Here, research is essential to improve the quality of care and inform clinical interventions and practices., which must be supported by solid evidence; this is often referred to as Evidence-Based Nursing.[4] To this end, nursing seeks to address and develop competencies that are linked to research, such as knowledge management, the production and publication of scientific manuscripts, and quality assessment for research projects.[5,6]

The syllabi of postgraduate Nursing courses frequently focus on the development of knowledge, competencies, and/or skills oriented mainly to healthcare, addressing research competencies with a noticeably lower intensity. The above considerably affects the performance of the nurse's role in this area, which makes it difficult to transfer the discipline's advances to patient care, as well as to other axes of the discipline.[7] Postgraduate students from programs such as Critical Care Nursing work in changing and complex environments, which requires them to integrate competencies linked to knowledge management to ensure the prescription and execution of quality care as much as possible.

Various studies mention that graduates, both from undergraduate and postgraduate programs, lack adequate knowledge in data collection, management, and processing, and the use of statistical software. Deficiencies have also been observed regarding training in scientific writing and reading habits, which combined with a high workload, multiple employment, long work hours, and the lack of incentives for continuing education and carrying out research, result in a complex scenario, affecting both the image we have of research and the capacities to carry out research activities.[8-11]

Despite the relevance of scientific research in Nursing, few studies have analyzed the perceptions, knowledge, attitudes, and practices of postgraduate Critical Care Nursing students regarding research. Understanding their views on research and the level of related competencies is crucial for the design of activities that promote solid training and evidence-based practice in this field.

Based on the above, this study aims to describe the knowledge, skills, and attitudes toward scientific research of postgraduate Critical Care Nursing students of a private institution in the Autonomous City of Buenos Aires, during the first semester of 2023.

METHODOLOGY

This is a descriptive study, with a quantitative and cross-sectional approach. The participants were postgraduate Critical Care Nursing students from a private institution in the Autonomous City of Buenos Aires (Argentina), who were enrolled in the first semester of 2023, and voluntarily agreed to participate in the study. The initial population was 49 students, who were invited to participate in the context of their academic activities. They were given information about the research and contact details were requested in order to send the instruments and the informed consent form with them. Of this population, 43 students (87.75%) agreed to participate. The sampling was non-probabilistic.

Two instruments and a battery of questions were used for data collection, between March and April 2023. Cronbach's alpha was used to estimate the reliability of the internal consistency of both instruments, for construct validation.

The first instrument was a survey designed by Vera Rivero et al., which allowed participants to self-assess their research knowledge and skills. This survey is composed of nine questions/skills that are scored on a Likert scale with three adjectives: adequate (score 3), moderately adequate (score 2), and inadequate (score 1). Two questions were included aimed at self-assessing the

ability to analyze qualitative data and to make citations and references in APA and Vancouver formats. Cronbach's alpha was calculated for the sample, obtaining a value of 0.72 (good reliability).[12]

The second instrument was the survey designed by Barahona Migueles & Medina which explores students' perceptions and attitudes towards the research teaching and learning process. This instrument is made up of 19 questions grouped into three dimensions: Personal Interest; Link Between Science, Society, and Research; and Scientific Research as a Way of Being. The questions are answered on a Likert-type scale with 5 adjectives ranging from "Strongly agree" to "Strongly disagree," and values range between one (worst perception) and five (best perception). Cronbach's alpha was used for our sample, obtaining a value of 0.91 (good reliability).[13]

Data collection was complemented with a battery of questions whose objective was to characterize the sociodemographic and occupational characteristics of the respondents, inquiring about variables such as sex, age, marital status, having children, academic year, experience in teaching and research, and professional seniority (years since graduation).

For data collection, the instrument was transferred to a Google form and sent via email along with the informed consent form. For data analysis, the surveys were exported to a Microsoft Excel database and processed using the Infostat/L software. For qualitative variables, absolute (n) and relative (%) frequencies were calculated, while for quantitative variables the median (Me) and interquartile range (IQR) were calculated. For the inferential analysis, non-parametric tests were used (due to the behavior of the data and the type of sampling) such as the U-Mann-Whitney-Wilcoxon test, the Kruskal Wallis test, and the Spearman correlation test (rho). The significance level was set at $p<0.05$.

Informed Consent was implemented, and no personal data were collected from the subjects such as names, surnames, identification numbers, record numbers, email, or any other information that would allow the respondent to be linked to the instrument; thus, anonymity was assured. According to current Argentine legislation, this is a "risk-free" study because it is observational, responses were anonymous, and no sensitive data were collected.[14,15]

RESULTS

The sample was made up of 43 students from the degree "Adult Critical Care Nursing Specialist", with an average age of 34.14 years (SD: 4.87, Range: 26-44 years), mostly female (74 .42%), single (55.81%) and without children (51.16%). Regarding the academic and work variables, they had professional seniority of 8.98 years (SD: 4.66), were mostly in their first year (62.79%), did not have experience in teaching at a higher level (69 .77%), and no history of participation in research activities (51.16%) or publishing scientific articles (93.02%) (Table 1).

The overall attitude towards the process of teaching and learning research was positive, with a median (Me) of 3.47 (IQR: 0.48) out of 5. The items "research is linked to my career" (M:5, IQR:1) and "learning to conduct research requires using the proper textbooks" (Me:5, IQR:1) received a better assessment, in the categories "strongly agree" and "agree", respectively. In contrast, the items "The syllabus of my degree addresses research extensively" (Me:2, IQR:0) and "I have extensive knowledge of statistical software" (Me:2, IQR:1) obtained lower mean values, leaving these statements in the "disagree" category (Table 2).

No statistically significant differences were found, when comparing the perceptions of the process of teaching and learning research, among sociodemographic variables such as age (p:0.955), sex (p:0.911), having children (p:0.751) and marital status (p:0.658); academic variables such as academic year (p:0.406), participation in research activities (p:0.330), and experience in publishing articles (p:0.999); and work variables such as professional seniority (p:0.117).

When analyzing the self-assessment of research knowledge and skills, a higher score was found for the items "Presentation of final reports using ICTs (for example, PowerPoint, Canva, etc.)" and "Interpretation and discussion of results presented in tables and charts", with 37.21% of the sample self-assessing their knowledge as adequate. On the other hand, the knowledge and skills

for "Analysis and processing of information through different statistical techniques" and "Selection, development, and application of methods, techniques, and instruments" were the worst evaluated, with only 20.93% assessing them as adequate (Table 3).

No relationship was found, during the inferential analysis, between academic year, teaching experience, experience in publishing scientific articles, participation in research activities, and self-assessed research knowledge and skills. Male respondents assessed themselves better in this axis (2.42 vs 2.01, p:0.015), and a negative correlation was found between the variables of age (rho:-0.35, p:0.021) and seniority, (rho:-0.45, p:0.002), which means that the younger the age and the lower professional seniority, the better self-assessment of knowledge and research skills were found.

The positive assessment of knowledge of research methodology (rho:0.32, p:0.036), use of statistical software (rho:0.30, p:0.054), considering oneself as a researcher (rho:0.35, p:0.022), was positively correlated to knowledge and research skills.

Table 1: Sample Characterization, 2023. (n = 43)

Variable	**Category**	**n**	**%**
Age	Mean ± SD	34.14 (4,87)	
Sex	Man	11	25.58
	Woman	32	74.42
	Other	0	0.00
Marital Status	Single	24	55.81
	Married	11	25.58
	Consensual Union	8	18.60
	Divorced	0	0.00
	Widow(er)	0	0.00
Children	Yes	21	48.84
	No	22	51.16
Academic Year	Year 1	27	62.79
	Year 2	16	37.21
Teaching	Yes	13	30.23
Experience (Higher level)	No	30	69.77
Participation in	Yes, I have participated	20	46.51
Research Activities	Yes, I currently participate	1	2.33
	No, I have not participated	22	51.16
Experience with	Yes	3	6.98
publishing scientific articles	No	40	93.02
Professional Seniority	Mean ± SD	8.98 (4.66)	
	Total	43	100.00

Source: Own Elaboration

Table 2: Perceptions of the students towards the research teaching/learning process, 2023. (n = 43)

Attitude	Me (IQR)	Strongly Agree		Agree		Do not Agree or Disagree		Disagree		Strongly disagree	
		n	%	n	%	n	%	n	%	n	%
I like scientific research	4 (1)	8	18.60	20	46.51	12	27.91	2	4.65	1	2.33
Learning to conduct research requires me to prepare more	5 (1)	23	53.49	17	39.53	2	4.65	0	0.00	1	2.33
I'm interested in learning to conduct research	4 (1)	15	34.88	20	46.51	7	16.28	0	0.00	1	2.33
Learning how to research requires discipline	4 (1)	21	48.84	21	48.84	0	0.00	0	0.00	1	2.33
I would like to carry out research or participate in research projects within my career	4 (1)	12	27.91	23	53.49	7	16.28	0	0.00	1	2.33
Teaching research in universities is not relevant to society	4 (1)	5	11.63	5	11.63	0	0.00	12	27.91	21	48.84
Research does not help generate new knowledge	5 (1)	3	6.98	0	0.00	2	4.65	14	32.56	24	55.81
Research is linked to my career	5 (1)	26	60.47	15	34.88	1	2.33	0	0.00	1	2.33
The syllabus of my degree addresses research extensively	2 (0)	10	23.26	29	67.44	3	6.98	0	0.00	1	2.33
Learning to conduct research requires using the appropriate textbooks	5 (1)	25	58.14	16	37.21	1	2.33	0	0.00	1	2.33
I have extensive knowledge of research methodologies	3 (1)	2	4.65	6	13.95	22	51.16	11	25.58	2	4.65
I like studying the topics related to my degree more than doing research	2 (1)	7	16.28	19	44.19	13	30.23	2	4.65	2	4.65
Having experience in research is not necessary to be able to work	4 (1)	4	9.30	4	9.30	9	20.93	17	39.53	9	20.93
My commitment is to understand research methodology slightly	3 (2)	2	4.65	15	34.88	13	30.23	8	18.60	5	11.63
I have extensive knowledge of statistical software	2 (1)	1	2.33	3	6.98	13	30.23	19	44.19	7	16.28
Researching comes easily to me	3 (2)	3	6.98	8	18.60	14	32.56	15	34.88	3	6.98
Students acquire the necessary research skills during research lectures	3 (1)	5	11.63	13	30.23	18	41.86	7	16.28	0	0.00
Research lessons allow for research learning to be comprehensive	4 (1)	7	16.28	22	51.16	12	27.91	1	2.33	1	2.33
I consider myself a researcher	2 (1)	2	4.65	6	13.95	11	25.58	15	34.88	9	20.93

Source: Own Elaboration.

Table 3: Self-assessment of research knowledge and skills, 2023. (n = 43)

Research Knowledge and Skills	Adequate		Moderately Adequate		Inadequate	
	n	%	n	%	n	%
Use of catalogs, descriptor books, and the preparation of bibliographic files	12	27.91	23	53.49	8	18.60
Formulation of scientific problems, research objectives, and research hypotheses, based on a health problem	11	25.58	23	53.49	9	20.93
Selection of the population, the sample, and the type of sampling	14	32.56	26	60.47	3	6.98
Selection, development, and application of methods, techniques, and instruments	9	20.93	25	58.14	9	20.93
Analysis and processing of information through different statistical techniques	9	20.93	25	58.14	9	20.93
Processing and analysis of qualitative data	10	23.26	25	58.14	8	18.60
Interpretation and discussion of results presented in tables and charts	16	37.21	22	51.16	5	11.63
The preparation of conclusions and recommendations	14	32.56	23	53.49	6	13.95
Preparation of final research reports	14	32.56	22	51.16	7	16.28
Presentation of final reports using ICTs (e.g., PowerPoint, Canva, etc.)	16	37.21	20	46.51	7	16.28
Creating citations and references following APA and Vancouver regulations	15	34.88	13	30.23	15	34.88

Source: Own Elaboration.

DISCUSSION

Nursing professionals have become familiar with research over the years, which has increased the number of publications, and a growing commitment of academic institutions to train competent researchers and promote the development of studies conducted by teachers with the participation of students. In Argentina, the above has translated into an increase in the hours assigned to research in undergraduate curricula, reaching 10.31% of the total minimum workload and the development of research content. In addition, *Comisión Nacional de Evaluación y Acreditación Universitaria* (National Commission for University Evaluation and Accreditation, or CONEAU) evaluates the quantity, quality, and impact of the products (articles and dissertations) generated by teachers and students in Nursing degrees, within the framework of accreditation.[16]

At the postgraduate level, the workload that should be allocated to research training has not been specified. However, students must complete their training by presenting a final work that integrates basic research skills (information search, systematization, scientific writing, and citation, among others).[17]

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Several studies have found a relationship between participation in postgraduate training and professional development, and a search to improve the quality of care provided to patients.[18] These aspects are also related to the development of professional competencies that are oriented towards career progress and the search for continuous improvement, which are present in the field of health research.[19]

A study carried out in Lima (Peru) with a sample of 145 Nursing students found that the majority perceived the integration of research into the curriculum and the research skills achieved to be moderately favorable.[20] In this work, a positive perception of health research was detected, represented in the belief that research is linked to their career, with the average attitudes towards research being higher than in the aforementioned study. This difference may be related to the profiles of the students who were surveyed, undergraduate and graduate, with the latter recognizing a clearer link with the development of professional skills.

Regarding the relationship between age and professional seniority and the attitude towards research, although no studies were found that described similar findings in graduate students, the relationship can be explained by the fact that younger respondents (recently graduated and with less professional experience) have graduated from newer curricula that offer a greater development of research skills and allocate more hours to related courses. Additionally, younger students tend to be more skilled in the use of technology and may have grown up in an era in which digital platforms and online resources play an important role in the dissemination of research. This familiarity with technology can positively influence their perception of scientific research and their ability to carry out related activities. On the other hand, regarding seniority, it has been described that professionals who have been exposed to health care environments longer recognize the value of research as part of quality patient care. However, given their lack of participation in related activities and the time passed since their training, the self-assessment of their knowledge and research skills shows a marked deterioration.[21]

The lack of experience in publishing scientific manuscripts stands out in this research. This coincides with other works, in which less than a tenth of the students have collaborated in at least one study.[22] Similarly, although no relationship was found between the academic year and self-assessment of research skills, various works have described an improvement in the ability to write texts using academic and professional terminology, the design and development of research projects, and mentoring and participation in professional organizations.[23]

Some studies such as Ochoa-Vigo et al., in which a sample of 556 Nursing students was included, revealed a statistical relationship between perceptions and attitudes towards research. In our study, no relationship was found between the aforementioned aspects, possibly due to the small sample size that impacts the strength of the statistical tests.[24]

It is noteworthy that the participants identified Statistics as a deficient area. This was observed both in their attitudes towards research and in the self-assessment of their research skills. Here, there is insufficient knowledge regarding information analysis and processing and the use of tools for data analysis. These findings concur with several studies that have revealed that graduate and postgraduate nurses show a lack of knowledge regarding data management, collection, and processing, the use of statistical software, and feelings of hate, panic, anxiety, and fear towards statistics.[11,17,25-27]

The participants assessed the approach to research in the curriculum as deficient, which translates as a perception that the contents are insufficient. This has been found in other research such as Magariño-Abreus et al., where a quarter of the respondents (n:91) expressed a need to increase the number of research methodology courses in the curriculum.[28]

Limitations include the small sample size and the non-probabilistic sampling, which may affect the representativeness and generalization of the findings. Despite the above, this study contributes to the understanding of the problem and identifies areas of interest for institutions that aim for their graduates to develop research skills.

CONCLUSIONS

A mostly positive attitude was found towards scientific research, which showed no relationship with sociodemographic, work, or academic variables. The approach to research in the curriculum and the knowledge of statistical software were the aspects with the lowest rating.

The self-assessment of knowledge and research skills was characterized as "moderately adequate", with reported difficulties in creating citations and references, and in the analysis and processing of information through statistical techniques. Sex, age, and professional seniority showed a relationship with knowledge and research skills.

It is important to highlight that, although 48.84% of the participants reported having participated in research activities, only 6.98% have published a scientific article. Attitudes toward scientific research and self-assessment of research knowledge and skills showed no statistical relationship.

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CME: Project management and supervision.
CBCJ: Data curation, validation.

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