Article

The Development of Research Skills in Nursing Postgraduate Training

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Abstract: The objective of this study was to understand the contribution of postgraduate training to the development of research skills, aiming at their application in clinical practice. Method: This was a qualitative, exploratory, and descriptive study conducted with eight nurses in the Local Health Unit of Baixo Alentejo, in Portugal, who had postgraduate training. The researchers conducted a group interview, or discussion group, using a semi-structured interview, which was assessed by two reviewers. The data were submitted to content analysis, and the results underwent a validation process with the participants and two reviewers. This study was approved by the institution’s ethics committee. Result: In terms of the research skills developed in nursing postgraduate education, the following indicators emerged from the participants’ discourse: understanding the research process, searching databases, developing literature reviews, assessing the quality of articles, developing research projects, communicating about science, and translating knowledge into clinical practice. Conclusion: The participants developed research skills in their nursing postgraduate training and reported developing these skills in their clinical practice.

Keywords: evidence-based clinical practice; postgraduate education; learning; professional competence; students

1. Introduction

Evolution of research, increased dissemination of studies, and complexity of clinical situations are a challenge to implementing the knowledge generated by research produced by healthcare professionals, and to the development of skills that allow them to adopt evidence-based practice (EBP). Nursing has shared in this concern, and research-related content is developed throughout different cycles of nursing education. However, the authors have observed that there is still a gap between theory (knowledge generated through research) and practice (the use of evidence), as if these were opposing entities [1].

Difficulties in translating evidence into praxis are associated with the nature of the professional skills required to implement evidence. Doing so requires scientific literacy [2–6], along with the ability to take on leadership roles, work collaboratively with other team members, and influence organizational decisions and health policies to ensure that research results are effectively used to improve healthcare safety and quality [2–4].

Other authors [3–7] have noted that nurses do not use EBP systematically in their decision-making because they lack the knowledge and skills related to the use, synthesis, and implementation of evidence [1,3]. This challenge is considered cross-sectional and is
present in different organizations [1,3,6]. Furthermore, in the same way that organizational culture influences and can hinder clinical decisions, variability among practice environments can also create barriers to the introduction of research results produced in different contexts, due to cultural differences [1].

Based on the issues outlined above, the main policies that guide undergraduate and postgraduate nursing education recommend that students be involved in research projects [7], because they provide opportunities to learn about research methods and techniques, and observe in situ how research results help improve care [3,8]. Furthermore, this involvement can contribute to reducing the time gap between knowledge production and its practical implementation [7].

Discussion of the implementation of research and EBP in nursing undergraduate curricula is not recent. Literature reviews have shown that, in the last decade, several articles have addressed the issue, with clear recommendations that students involved in activities related to the research, synthesis, and implementation of evidence [3,7–9]. Furthermore, most studies on the topic include undergraduate students.

Nursing experts and those with postgraduate degrees should lead processes of change and foster a culture and spirit of research conducive to advanced nursing practice. In this way, they demonstrate greater decision-making capacity and experience in areas such as assessment and diagnosis, planning and implementation, and evaluation of care [10]. To this end, it is essential that nurses undergoing postgraduate training have an understanding of the theoretical–practical integration of research knowledge and develop attitudes and skills that allow the translation of this knowledge so that they can adopt evidence-based professional practice.

This is a clear call for a paradigm shift, not only towards EBP, but toward research-informed education in which students are no longer passive actors in the knowledge production process but are proactive, learning about and using research skills [11] and influencing the teams they will lead as experts in their fields. Nurse leaders must have the ability to respond to ever-changing clinical environments, to manage organizational expectations and changes in local and national policies [10], and to create opportunities to influence these policies based on the use of knowledge.

In light of the above, the objective of this study was to understand the contribution of nursing postgraduate training to the development of research skills, using a qualitative methodology, which proves to be appropriate to try to understand how postgraduate training contributed to the development of these skills, based on the points of view of these nurses and the complexity of the lived experiences.

2. Materials and Methods

2.1. Study Design

This was a qualitative, exploratory, and descriptive study, focused on analyzing research practices and the integration of research skills into professional practice.

2.2. Location and Participants

This study was conducted in Portugal, where the training of nurses has some particularities, because it includes two cycles. The first cycle (4-year degree) allows for the training of general care nurses. Nurses with two years of professional activity can apply for the professionalizing master’s degrees, in the nursing specialty areas defined by the Portuguese Order of Nurses. In this specific case, students are of the specialization course in rehabilitation nursing and medical surgical nursing.

The above the participants of this study were nurses that are obtaining their master’s degree in Baixo Alentejo, which is an associative master’s degree, i.e., it involves all the health schools in the south of the country and is designed to prepare students for the production, communication and transfer of results into clinical practice and to meet the health care needs of an elderly population. In the specific case, an intentional (non-probabilistic) sample was used, and the participants were selected by the main researcher: eight nurses
with more than 5 years of experience and with several experiences in different contexts of hospital care, i.e., clinical practice in different units during the course of their professional activities. Participants who belonged to the institution, had a nursing postgraduate degree, and participated in research activities during or after the program were included. No exclusion criteria were defined.

2.3. Data Collection

The researchers collected data via a group interview, or discussion group [12,13], which is one of the most commonly used data collection procedures in social research in education and health, particularly qualitative studies. To this end, a semi-structured interview script was created, which was submitted to the assessment of two reviewers who ensured the instrument’s content validity. The main goal of this process was to ensure that the questions actually gathered information relevant to the studied domain and that they were aligned with the defined objectives.

The first part of the interview collected personal and professional data about the participants. To understand the contribution of nursing postgraduate education to the development of research skills, the script included two questions that guided the group discussion:

- What research skills did you gain as a result of your postgraduate training in nursing?
- How do you define and/or assess the development of these research skills?

The participants were contacted by the main researcher, who presented the project and explained its purpose and objectives, and the importance of their participation. This contact was established via phone calls or e-mail.

The interview was conducted by the main researcher in a meeting room agreed upon by the participants. The venue was noise-free, in an environment that ensured the privacy of the participants, with comfortable seating. The environment facilitated communication among the participants, allowing everyone to express their views. The time scheduled for the group interview was defined based on the options given by the participants. The interview lasted approximately 90 min. It was audio-recorded and later transcribed to a Word file, with the participants’ permission.

The participants discussed the topic freely and spontaneously, focusing on their research experiences. This discussion led to greater depth and richness of the information about the topic. The researcher established an environment that respected the opinions of each participant, and the group discussion process led to a consensus about the topic. Therefore, the group represented an context of stability and consensus in its discussions about the two guiding questions.

2.4. Data Processing and Analysis

Content analysis was used to process the data, more specifically, thematic, or categorical, analysis [14]. It is a set of data analysis techniques that involve objective procedures for describing the contents of messages, allowing the inference of knowledge related to them. It favors the discoveries and interpretation given by the participants to different situations, valuing the subjectivity of their experiences.

In the first phase, the researchers conducted a preliminary reading of the transcribed interview to verify whether the collected information was related to the objective of the study. The full transcript of the group interview formed the corpus, i.e., the material to be analyzed and produced for the study [14]. Second, the data were coded by defining recording units and context units. A recording unit was defined as a theme; according to Bardin [14], this is a single assertion about one subject, to which a set of single formulations can be attached. A context unit was defined as a unit of understanding used to code and comprehend the exact meaning of the recording units. In this study, we defined context units as each participant’s answers to the questions asked. At this stage, in addition to defining the coding units, categories and indicators were also established. In the third phase, inference was used to attribute meaning to the qualitative analysis of the categories.
To ensure the quality of the study, the following procedures were adopted:

1. The researchers explicitly defined the data collection and analysis procedures, in addition to the study’s theoretical framework;
2. Participant review: The results of the analysis conducted by the main researcher were given to the participants so that they could validate whether the interpretations reflected their ideas on the topic;
3. Peer review: Reviewers/experts on the topic were asked to validate the content analysis, namely, the interview categorization and coding process and the inferences made. They were also asked to introduce suggestions to optimize the inference process, with suggestions for improvements.

2.5. Ethical Aspects

The ethical principles that must guide studies of this nature were followed in relation to the institution and the participants of the study. At the institutional level, the study was approved (EDOC/20326—Point 3) in meeting no. 5/2018 of the Ethics Committee of the Local Health Unit of Baixo Alentejo and approved by the institution’s administrative board on 9 May 2019 (Minute no. 21, point 4.1). Participants were assured that their participation in the study would be strictly voluntary and that they could withdraw at any time, without having to justify their decision and without it affecting any of their future treatment. Data anonymity and confidentiality were ensured, considering professional secrecy as an obligation and a duty. Furthermore, the participants signed informed consent forms.

The principal investigator ensured the contact with the participants, having ensured the presentation of the research project and explanation about the purpose of the study, the objectives, and the importance of their participation.

The main researcher was responsible for managing the collected data and ensuring its anonymity and confidentiality. Any information that could identify the participants was kept restricted, and each participant received a code. The names of the participants were replaced by identification numbers (P1, P2, P3, etc.) in the transcripts and article. The excerpts (recording units) presented in the results were adapted to protect the participants’ identity. Data protection was applied starting with the selection of the participants all the way through data collection, data analysis, and the publication of the study results.

The information gathered and submitted to analysis and the informed consent forms will be retained in the main researcher’s records for the five-year mandatory period. The data were also encrypted, including raw data, to prevent access by unauthorized third parties. Thus, other people cannot access this information.

3. Results

The discussion group included eight nurses with postgraduate training in the field. All the nurses had master’s degrees and the title of nurse specialist in one of the areas of specialization defined by the Portuguese Order of Nurses. They were 31 to 50 years old, with an average age of 37.4 years. Most (six) were male.

The analysis of the interview with this group of nurses allowed the researchers to investigate the nature of the research skills developed in their postgraduate training. As this was a thematic analysis, this process involved breaking up the texts into recording units (themes) and categories, according to analog regroupings, in line with Bardin’s theory [14]. To this end, semantic categorization criteria were used.

In this study the emerging category was “Research skills developed in nursing postgraduate training”, which emerged a posteriori from the participants’ discourse as a result of analog and progressive classification of the elements into the following indicators: understanding the research process, searching databases, developing literature reviews, assessing the quality of articles, developing research projects, communicating about science, and translating knowledge into clinical practice.
Research Skills Developed in Nursing Postgraduate Training

This category presents the participants’ perceptions of the different research skills developed during or after their postgraduate training. The skills correspond to indicators that emerged from the participants’ discourse, as a result of the semantic analysis conducted of the selected recording units. This category involved the following indicators:

**Understanding the research process**

Nursing training and research are determinants of the construction and development of a body of knowledge that allows students to understand the research process.

[...] Understanding how the research process develops, from the initial stages.

(P4)

**Searching databases**

This skill should result in significant learning of specialized knowledge and the development of research capacities that translate into the ability to use suitable resources and instruments. This is important for finding solutions to problems that arise in clinical practice and for designing and implementing research projects.

[...] Essentially, I improved my skill of being able to conduct research correctly, perhaps, to search for answers. Before maybe I used to resort more to Internet search engines and now I try to focus more on more reliable search engines. I leave Google aside a bit and access more databases.

(P8)

[...] Even our thesis will generate a research article, but to get there we had to gather and review a lot of information using these search engines and platforms.

(P5)

[...] Recently a colleague of mine asked me to give a presentation in a work context. I do not even consider exploring the topic without consulting these databases.

(P8)

**Developing literature reviews**

As a scientific method, literature reviews help map, summarize, and synthesize evidence about a specific issue. Therefore, it is essential that nurses be familiar with adequate sources of information to update their knowledge about certain topics and that they develop skills relative to information management and scientific communication.

[...] Develop quality research with an adequate theoretical foundation that is as updated as possible and then operationalize it.

(P4)

**Assessing the quality of articles**

This skill enable nurses to critically appraise scientific production in their field, increasingly contributing to the selection of methodologically high-quality articles.

[...] We had to evaluate the quality of some articles so that we could later write our own.

(P7)

[...] This also allows us to understand the quality of the articles we are using so that we can later produce something. Previously, we resorted to databases like Google, but after the course, we realized that there are search engines that allow us to access high-quality articles.

(P7)

**Developing research projects**

Postgraduate training aims to ensure that students acquire the necessary skills to develop research projects, as expressed in the discourse of the participants.
[...] I ended up acquiring master’s level skills, which enables me to develop, (...) a research project

(P1)

[...] But when I finished my master’s degree I ended up knowing how research projects were developed.

(P1)

[...] Only with this experience (...) was I able to develop my own project, and then soon after I developed another project, following all the steps.

(P2)

[...] It is the capacity that was acquired, we acquired skills in how to structure a research project, knowing what to do and the steps to operationalize it.

(P2)

Communicating about science
Research skills include the dissemination of studies at scientific events and publishing scientific articles in journals specific to the field.

Those with master’s degrees must be able to disseminate their results, communicate, know how to develop the ability to communicate, i.e., sometimes people focus solely on their knowledge.

(P3)

[...] it is very important (...) to develop and disseminate and share our knowledge.

(P3)

I wrote an article, I have a paper all written up, but it’s not published yet.

(P5)

[...] as part of the ICU [Intensive Care Unit] internship we also had to write a research article on a topic of our choice relative to ICU care, and it complemented our internship assessment. Afterwards, in the master’s program, I also wrote my thesis based on a simulation using a data sheet, analyzing the data, looking for evidence, based on which I later wrote an article that came out together with my thesis.

(P6)

[...] I also produced an article that was related to the work I was doing here, but neither of them were published. However we were given the foundation for being able to work with and carry out these types of reviews.

(P7)

Translating knowledge into clinical practice
It is essential for nurses to produce and recognize the value of research in order to give meaning to and incorporate knowledge into clinical practice. This translation of knowledge is decisive to developing and legitimizing the discipline and profession.

Clinical practice includes developing theory-based research projects, i.e., everything that involves the research process, introducing it into practice, developing projects for the future, abiding by all the rules, and finally producing projects at a PhD level or even for institutional practices and improving quality of care.

(P4)

4. Discussion
Nursing education faces several challenges [15,16]. The results of the present study corroborate the opinions of those who contend that the need to learn research skills, including how to synthesize, translate, and implement evidence, and develop skills that
help professionals adopt knowledge-guided practice, represent a call to rethink the place of evidence in nursing curricula, especially in postgraduate training [3–9,15]. This level of training should prepare nurses to provide safe and high-quality care in ever-changing care environments [15] and to lead their teams.

The findings of the present study show that nursing postgraduate training allowed nurses to develop research skills, specifically understanding the research process, carrying out literature reviews that follow the scientific method, conducting structured searches in databases, assessing the quality of primary studies, developing research projects, engaging in science communication, and translating knowledge into clinical practice. These skills are determinant for an evidence-based practice.

Previous studies of the involvement of students in research projects in which they conducted systematic literature reviews, designed research projects, and/or participated in some stages of research have shown results similar to those of the present study [3,17–19]. In these studies, the authors emphasize the need for further research about how to implement EBP and train nurses in this approach, in both clinical and academic contexts, considering the characteristics of nursing professionals, who are both users and potential producers of knowledge [20].

The participants in the present study had the opportunity to develop research projects as part of their internships and to implement the projects as a part of their master’s degree curricula. Thematic analysis of their discourse showed that this methodology may have fostered their understanding of the research process and the development of literature review skills. In one of the excerpts in the “searching in databases” subcategory, a participant stated that she never explores a topic without resorting to databases. Further research should explore the influence of postgraduate programs and of the skills developed on the adoption and maintenance of EBP in the years following this training, as well as on team leadership.

A recent systematic literature review that evaluated the effectiveness of teaching and learning strategies to incorporate EBP in the curricula of nursing master’s programs found that there is a shortage of empirical evidence supporting EBP teaching/learning strategies at this level of education [20]. Despite the scarcity of studies that support this pedagogical approach, some argue that EBP cannot be learned in the physical space of the university but only through students’ engagement and active participation in research projects [9,21,22]. Furthermore, coordination between theoretical/theoretical–practical classes and clinical internships enables better integration of both theory and practice [3], contributing to the integration of knowledge into clinical practice.

Nurses recognize the value of scientific communication and the opportunity to disseminate research results by implementing projects in clinical contexts. This helps improve the recognition of nursing work and motivates professionals, in addition to fostering best practices and improving care outcomes [23,24], because the evidence produced impacts people’s lives. Some authors argue that gaps in evidence produced by studies, lack of use in different clinical settings, and absence of knowledge-mediated health policies are due to ineffective dissemination [3,24], hindering the adoption of EBP.

Regarding the “translating knowledge” subcategory, it is clear that the methodology used allowed for the integration of theory and practice and for changes in clinical practice. The issue of translating and implementing evidence is associated with difficulties in communicating about science with health professionals, especially with healthcare users [1,3,5], lack of an EBP culture, and lack or insufficiency of scientific literacy and collaborative work among professionals [3–5].

Despite these difficulties, it is consensual that the nurse, using advanced and evidence-based nursing care, assumes a leading role in the process of individualized care to the elderly population and their caregivers, improving health outcomes sensitive to nursing care [25]. The use of evidence should be considered a priority practice since the implementation of knowledge in a structured way contributes to the continuity of care, optimizes
available health resources, raises the quality of care, and fosters a more sustainable health system [1,3,21].

The coordination and integration of care in the community with hospital care, ensuring continuity of care and the provision of cost-effective care in the life contexts of the ageing population, is a persistent challenge [25], but one that should be assumed by nurses because there is evidence that it reduces unnecessary visits to the emergency room and hospitalizations due to the aggravation of chronic diseases and accidents, such as falls, which are a serious public health problem [19]. Multidisciplinary teams alone are not enough [3,7]. It is necessary to guarantee training, follow-up, and coordination between professionals, community, and support services for the elderly population, which implies the development of complex skills at the Masters level.

The findings of this study have important implications for nursing postgraduate training and health policies and education. They provide information about how graduate education can enable the development of research skills. We believe that their impact can influence the quality of evidence produced, its dissemination, and its transfer into clinical practice, with implications for improving the quality of healthcare.

Limitations of this study include its method, the type of interview chosen, and the participants’ eligibility criteria. Further studies with a greater number of participants should be conducted to enable a more in-depth investigation of the strategies that enable the learning of evidence-based practice.

5. Conclusions

This study showed how the participants in the sample developed research skills during their nursing postgraduate training. They were more aware of the research process, understood the value of literature reviews according to the scientific method, carried out structured and systematized searches in databases, were able to assess the quality of primary studies, felt more capable of developing research projects, and recognized the value of communicating science and translating knowledge into clinical practice. The development of these skills can contribute to improving the dynamics and leadership of teams when implementing EBP and thus improve quality of care and health outcomes.

Further studies should explore pedagogical strategies that enable theoretical–practical integration of research into the clinical practice of nurses with postgraduate training, and how research skills are mobilized in clinical decision-making processes and in the specialized interventions of nursing professionals.


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Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved (EDOC/20326—Point 3) at meeting no. 5/2018 of the Ethics Committee of the Local Health Unit of Baixo Alentejo and approved by the Board of Directors of the institution on May 9, 2019 (Minute no. 21, point 4.1).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data used during this study are available from the corresponding author, under request by e-mail.

Conflicts of Interest: The authors declare no conflict of interest.
References


18. Einarsen, K.A.; Giske, T. Nursing students’ longitudinal learning outcomes after participation in a research project in a hospital. *Int. Pract. Dev. J.* 2019, 9, 4. [CrossRef]


