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ORIGINAL ARTICLE

RESEARCH AS A SCIENTIFIC AND EDUCATIONAL PRINCIPLE IN NURSING TRAINING

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ABSTRACT

Objective: To identify how the approach of the theme scientific research can contribute to the development of scientific competence in the perception of nursing students. **Method:** This is a qualitative, descriptive and exploratory case study developed in the undergraduate nursing course of a public university in southern Brazil. Data were collected by three focus groups with 23 students and document analysis. Data were analyzed in Content Analysis and discussed from Pedro Demo's theoretical perspective. **Results:** From the speeches we evidenced two categories: "Building an investigative competence: definition, importance and learning moments" and "Scientific competence in training: research as a subsidy for professional practice". **Final considerations:** The investigative competence for nursing education was attributed to the curricular arrangements, the problematization method, the tutorial pedagogical strategy, the teacher's role as activator in the teaching-learning process in research and the extracurricular activities, to improve the practice.

Keywords: Education higher. Nursing Education Research. Curriculum.

INTRODUCTION

Research is an essential theme in nursing education, aiming at the development of the investigative attitude in students, with favorable repercussions for the application of scientific knowledge in future professional practice[1]. There is an exponential and multidimensional challenge in learning research during undergraduate school, in order to perpetuate its practice in the professional context[2].

The National Nursing Curriculum Guidelines (DCN) established in 2001, define proposals for the construction of the pedagogical projects of the course, mentioning the undergraduate profile, competences and main skills to be developed during the training. It also allows the projects to be developed collectively by the faculty, so that the student is the focus and the teacher a facilitator of the teaching-learning process[3].

Training a qualified professional for the profession based on scientific and intellectual rigor, able to intervene in problem situations in a humanistic, critical and reflective way, is not an easy task, since the hegemony of the traditional model of education prevails until the nowadays[4-5]. Such a model places the teacher at the center and the student as an ordinary disciple, a copier of what is being transmitted, training limited citizens to intervene in their social realities[5].

To counteract this educational practice, it is expressed the understanding of research as a scientific-educational principle[6], by arguing that, to train subjects capable of innovative action, it is necessary to go against this fragmented model, which reduces the student to object and which makes an apparent separation between teaching and research. The two acts must be inseparable, in order to form emancipated citizens and capable of professional performance[7].

The face of research as a scientific principle, through the scientific method, enables the

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training of the researcher, and contributes to the student not being restricted to "memorize", but to reaching the ability to creatively discuss alternative ways of knowledge[7], contributing to the advancement of the profession as a science, by allowing to create, innovate as the reality in which they are inserted is reconstructed[5].

In the scenario of changing and breaking educational paradigms, several schools have sought to innovate in nursing education and the integrated curriculum is a path with positive implications[8]. In this sense, the development of studies that seek training with regard to scientific research in the student perspective, which highlights the teaching and learning methods and their importance, can support the development of pedagogical projects of undergraduate courses in research training for nurses[9].

In this study, competence was understood by the set of knowledge, skills and attitudes needed to complete a specific activity, that is, to insert into practice what was learned in a given context[10]. In the educational project under analysis, scientific competence is the qualifier and transformer of the reality of health through the development of research or other forms of knowledge production[9].

Given the above, we question: How does the student's training occur in relation to the theme scientific research in the integrated curriculum of the Nursing Course of a public university? To answer this question, this study aimed to identify how the approach of the scientific research theme can contribute to the development of scientific competence in the perception of nursing students.

METHOD

This is a qualitative, descriptive and exploratory case study, which allows a detailed understanding of the meanings and situational characteristics in a given context[11].

The research was conducted in the Nursing course of a public university in Southern Brazil, which uses the integrated curriculum since 2000. The course is structured in four years/series, with curriculum structure that privileges the development of content by interdisciplinary modules and 12 cross-cutting themes, reaching the teaching in all the series. The pedagogical conception adopted is the problematization, prioritizing the active methodologies in the teaching-learning process.

Data were collected through two techniques: document analysis and focus group, selected to favor interaction, reflection and discussion among respondents, aiming at less accessible information outside the collective context[12]. Firstly, a documentary analysis of the planning and development booklets of the course's interdisciplinary modules for the four series was performed. The reading of the material took place in four stages: exploratory, selective, analytical and interpretative[13]. Between October and November 2014, three focus groups were carried out, in which 23 Nursing students who met the following eligibility criteria participated: to be enrolled in the third or fourth grade of the course, as they had already experienced the modules with the following content: scientific research.

Prior to the focus group, the classrooms were visited to explain the research object and to invite them to participate, in which the interested parties filled out personal information and schedule for data collection. Prior to the discussions, participants and the research team presented themselves, clarified the study objectives and procedures, and signed the Informed Consent Form - ICF. Students answered a questionnaire about socio-demographic and academic characterization data.

In addition to the researcher who led the group, two observers collaborated, who received prior training. Three sessions were held (two with fourth graders and one with third graders) with an average duration of one hour and 30 minutes and no need for further focus groups due to data saturation. The interviews were audio-recorded, filmed and transcribed in full after their completion.

The transcripts were submitted to Content Analysis in the thematic modality proposed by Bardin[11], composed by: pre-analysis, in which exhaustive readings of the interviews were performed for impregnation and familiarization with the content; in the exploration of the material, the speeches were classified according to the objective of the study; in the data treatment, the words were interpreted, bringing

them meaning and from that, the study categories were listed.

The data were discussed according to Pedro Demo's theoretical perspective, which refers to Educating through Research[5,7], that is, the research inserted in the student's educational path, training emancipated and competent subjects, both for the reconstruction of their own knowledge, and to change the reality in which they are inserted.

This study was approved by the local Research Ethics Committee according to opinion 84,180/2012, CAAE (Certificate of Presentation for Ethical Consideration) 18931613.5.0000.5231. To ensure anonymity, the students' speeches were identified by the letter S, referring to students, followed by the numbers corresponding to the grade and group participants.

RESULTS

In the integrated curriculum of the Nursing course under study, scientific research is proposed as one of the cross-cutting themes, focused on the development of scientific reasoning and critical thinking, aimed at improving nursing care and the population's quality of life. In the documentary analysis we verified through the planning described in the booklets that there are several moments in the course that the student is instigated for scientific investigation through active methodologies, proposing activities for the development of competences and abilities.

The learning of the research also takes place through specific interdisciplinary modules: Interdisciplinary Practices and Teaching, Service and Community Interaction I, in 1st grade and Interdisciplinary Practices and Teaching, Service and Community Interaction II in 2nd grade, Course Conclusion Paper I in 3rd grade and Course Conclusion Paper II in the 4th grade. Consideration should also be given to encouraging extracurricular activities such as scientific initiation, extension projects and participation in research groups.

There were 23 students participating in the focus groups: 15 from the fourth grade and 8 from the third, all female. The age ranged from 20 to 31 years for fourth graders and 20 and 24 for third graders. Eight students from fourth grade attended high school in private institutions; in the third grade, six came from public institutions.

Regarding participation in investigative activities during the undergraduate course, most of the interviewees created research projects, almost all reported that their projects resulted in scientific research presented at scientific events, 20 students participated in scientific research, 14 were research fellows, 17 were part of extension projects and one participated in a research-teaching project.

The analysis of the transcribed material of the interviews allowed the elucidation of two categories that highlight the research in nursing education and are presented below.

Building an investigative competence: definition, importance and learning moments

In conceptualizing scientific research, students were proactive. Among the narratives, we observed the citation of some steps that are part of the scientific method:

> Scientific research is an investigation that meets pre-established criteria in order to answer a question [...] it must obey ethical aspects that do not violate human rights in order to meet the objectives. (S3,3)

The investigative attitude must be part of the daily life of academic education. Therefore, various teaching methods should be used in this process, in order to stimulate the search for knowledge and scientific advances on the studied subject, as found in the reports:

> These are studies based on a problem, in which hypotheses are listed to answer such a question and from this, the search for the answers to this problem is sought through scientific research. (S4,4)

> Scientific research is the search for knowledge and scientific advancement on the subject under study. (S4,7)

Students highlighted the importance of research for scientific advancement and its contribution to society:

> [...] It is central for the construction of knowledge. (S3,3)

> Scientific research is a contribution from the researcher to society. (S3,7)

Students spoke about specific moments of the course in which learning about scientific research took place significantly, mentioning the interdisciplinary modules of the integrated curriculum that have scientific research as a teaching theme:

> We start the course with Interdisciplinary Practices and Teaching, Service and Community Interaction I, which is an incentive for multiprofessional research, you learn to approach the patient, learn to collect data, learn from the very beginning. (S4,2)

The planning and development booklet of the module Interdisciplinary Practices and Teaching, Service and Community Interaction I brings, in the structuring of the text, evidence on the research theme, as observed in the fragment:

> To conduct interviews with the patient and/or family [...] to collect primary data and to establish an ethical, respectful and cooperative relationship with the interviewee. (Module Book Interdisciplinary Practices and Teaching, Service and Community Interaction I)

Another possibility derived from the pedagogical conception is the problematization, incited in the tutorials, which, by itself, provokes the investigative attitude in the students, by advocating the search for reliable sources for research in the search for knowledge:

> In high school it's like this, a lot is taught from content. [...] since it is problematization, we have to go after knowledge, in the tutorials mainly, we see how important it is to have a reliable source, to really know what to research, the first contact with the research is in the tutorials, the Health-Disease Process module was the first tutorial. (S4,1)

The Health-Disease Process module planning and development booklet presents, in its organization, three thematic units that are worked in different ways, among them, the teaching-learning strategy in mid-sized groups (8 to 12 students). The document describes the steps and responsibilities of each group member in the tutorial sessions. During the dynamics of the stages, students experience individual and collective moments of study, as shown in the module booklet fragments:

> 1. Reading of the problem; 2. Identification of the proposed questions; 3. Formulation of hypotheses; 4. Summary of hypotheses; 5. Formulation of learning objectives; 6. Individual study of the subjects raised in the learning objectives; 7. Return to the tutorial group to discuss the problem one more time; 8. Oral assessment. (Health-Disease Process Module Booklet - 1st grade)

Although the tutorial uses some steps from scientific research, such as this search for new information, students mention the Course Conclusion Paper module as a space for learning all the steps of the scientific method. In this module, the student individually develops all the steps of a scientific work, as shown in the fragment:

> Competence: prepares research report in the form of a scientific paper or monograph. (Course Completion Paper Module II - 4th Grade)

When learning is meaningful, the student remembers, knows how to explain, elucidates quickly when asked. In this aspect, in the words of the students, learning about scientific research happened in a relevant way in some of the experienced modules. Specifically, in the Course Conclusion Paper module, cited by them as a unique moment of learning and deepening the steps of the scientific method:

> In the tutorial we have in almost every module, which was objective, problematization [...] but specifically, to learn the steps is in the Course Conclusion Paper. (S4,4)

> In graduation, it will be in these two moments that we have contact, in the module Interdisciplinary Practices and Teaching, Service and Community Interaction and in the Course Completion Paper, but I think the Course Completion Paper deepens a little more. (S4,6)

Regarding the approach to scientific research during the undergraduate course, the students also mentioned some extracurricular activities, such as: scientific initiation; participation in extension, teaching and research projects, as well as research groups. These are learning spaces that becomes materialized in addition to the curricular activities.

> [...] for me it was scientific initiation, for me that is where research began. (S4,7)

> [...] those who participate in the group have a better base, if it stays only restricted to the curriculum there are few moments. (S4,6)

> [...] we set up the pre-project of the Course Conclusion Paper, I told the girls, I found it very easy because of the scientific initiation. (S3,3)

It is observed in this category that the construction of scientific competence happens with successive approximations on the theme through different teaching strategies.

Scientific competence in training: research as a subsidy for professional practice

By guiding scientific research with professional practice, the relationship between theory and practice is evidenced, in the sense of moving towards advancing the profession. More than socializing the knowledge produced, it is necessary to apply it. The speeches of academics bring to light the link between research and care:

> I don't see how to separate scientific research from our professional life, because if you think everything is related. (S3,3)

> Really, without research we are nothing [...] practice without theory is nothing, just as theory without practice is nothing, so one complements the other. (S4,1)

The process of learning scientific research during student education can positively or negatively influence the continuity of doing, applying, and consuming research after graduation. This conception was evidenced in the statements:

> [...] I like research, it is central for nurses to be updated, I particularly want to invest in this area of research. (S4,6)

> I want to keep researching, through research we change our mind, it moves us, I want to research, I like it. (S4,4)

> I don't particularly want to go into this area [...]. (S4,8)

> I want to improve myself, so I know it will be in my life forever, but I don't do it and period. (S4,7)

> I would do research, but I wouldn't be a researcher, sometimes we have prejudice. Oh! What a boring thing, research, but I think one thing that helps a lot is researching things you like. (S3,4)

> I do not intend to be a researcher, but if it is to research something that I am interested in, then things change for me, then I have total interest. (S3,1)

The continuity of research after graduation is directly influenced by the way the student experienced this learning during the course, highlighting the teaching role in this process.

DISCUSSION

The participants conceptually explained how a research is developed, which is essential to enable the investigative action. The act of research, as a scientific method, should be incited to the student throughout his training process, so that, at the end of the course, the person has competence to investigate scientifically. The individual who learns to research leaves the object position and becomes emancipated, produces the cyclic reconstruction of his/her knowledge, resulting in a critical thinking of reality, in which he/she intervenes in an innovative way[5].

From this perspective, the concept of research is fundamental because it is at the root of questioning critical consciousness. The excerpts from E4,4 and E4,7 represent the awakening to a curiosity, restlessness, a continuous search for discovering and advancing knowledge, highlighting the act of research as an educational principle[7]. Training in the perspective of integrated curriculum has the purpose of problematizing the situations experienced in practice, providing the student with the opportunity to act as the main agent in the search for knowledge, and to develop investigative attitudes[14].

Students have also ratified the importance of research and there is no doubt about the scientific evolution in the present century[15]. Science is moving fast, and in the midst of this challenge to keep up with all these changes is to educate individuals to be builders and rebuilders of their own knowledge. Individuals capable of innovating and intervening in their realities contribute to society by bringing results that modify or renew the practice of the profession, in order to follow his/her own path in this process.

Educating through research implies in reconstructive questioning, which results in constantly renewed knowledge, cooperating for

the construction of the competent social subject, also in continuous reconstruction. The construction of historical human competence is in the condition of knowing how to make and, above all, permanently remaking the relationship with society and nature, using the transformative knowledge as an instrument[5].

The underlying intentionality of the planning of pedagogical activities came up in the words of the students, because, when conducting interviews with the patient, the student is performing a step of the scientific method, the data collection, which, at first, may not have great significance. However, successive approaches by the investigative method during the course can result in the construction of self-knowledge significantly, and it can be inferred that the teaching units present in the modules lead the student to a gradual approach with greater depth in the development and construction of knowledge[16].

The stimulus that the student receives for research should seek the balance between collective and individual work, so that, in the individual study happens the improvement of individualities, personal opportunities, psychological and social identity, self-esteem, among others. Collective work, on the other hand, requires the exercise of citizenship with organization, which is a great challenge when it comes to building a truly productive teamwork[7].

Research as a scientific principle - research as a science - must be combined with research as an educational principle, in the sense of using a problematizing pedagogy, in which the student learns to learn, does his/her own elaboration, questions, seeks solutions, starting from something already existing, being possible to (re)build its knowledge[7]. Teaching-learning strategies that are based on problems encourage the student to be active in the process of searching for knowledge, enabling the a critical view on the theme under discussion[17-18].

The deepening happens primarily when the student reaches the stage of his or her Course Conclusion Paper, which is expected by this module to provide the relationship between theory and practice. Since it is performed individually, it allows the student moments of self-elaboration, starting an important step for the reconstruction of knowledge in a unique way. The Course Completion Paper was instituted from the DCN of Nursing in 2001[3], defining the history of teaching in Nursing.

Regarding the activities that initiate the training of researchers, scientific initiation contributes to a better performance in the undergraduate and personal development of the student, leading him/her to critical thinking, autonomy, creativity, maturity, responsibility, and may contribute to the intellectual evolution of the student, besides stimulating the citizenship through the socialization of their researches[19].

Participation in research groups opens space for discussion of research projects and results among teachers, undergraduate students, postgraduate students and technical support staff[20]. Thus, the student has the opportunity to experience contact with the research carried out between the graduate students, getting used to the research steps and participating in any of them, providing a basis for the development of new projects and individually designed research.

Therefore, there is a parallel scenario to the curriculum structure in the training of nurses with investigative competence evidenced by scientific initiation, research, extension and teaching projects, as well as research groups, which, in themselves and as a whole, broaden the horizon of undergraduate students in the field of scientific research.

Applying the knowledge produced by scientific research to professional practice is one of the major challenges found in nursing, since many scientific productions have been advanced, but few of the findings have its use in practice[21]. Research necessarily incorporates practice, as this is where the renewal of theory is sought, and in theory the renewal of practice. One should never dilute this mutual complementation.

It is important that theory and practice go together to enrich work, since one is no more important than the other, both are part of the scientific construction. For Demo[7] creative practice cannot be accomplished without constant return to theory, nor it can impregnate theory without confrontation with practice.

Scientific research can be considered as an engine of providing quality care to the population, as it is an inexhaustible source in the

construction and production of knowledge. The use of research in nursing care practice has been a constant search, however some obstacles have hampered this process among professionals, such as lack of preparation of nurses, lack of perception of research as part of their practice, lack of time and organizational preparation[2,22].

The search for knowledge must be continuous and daily in the academic environment, so that the subject uses scientific research as a means to this end. More than that, knowledge needs to be applied, taken from theory to practice, so that there are real transformations and innovations of reality[5].

The student's view regarding the usefulness and applicability of research in care practice denotes a strong scientific competence in the professional field and the consequent participation in the health team as a questioning agent and reality transformer. The development of scientific competence should begin at undergraduate level, breaking with the hegemony of research teaching predominantly in graduate nursing.

It is essential to demystify scientific research as being an elite activity, so that few would have access to it[7]. The students' speeches evidenced a possible dichotomy between the researcher nurse and the nurse who makes research, however they stated that, when driven by a pertinent theme, the desire to continue researching emerges.

The fact that some students mentioned the lack of interest to continue this process, it brings the reflection of the teaching role, in order to investigate the particular experience of these individuals in the path of learning in relation to the theme. In addition to mediating knowledge and encouraging students to search for it, teachers need to work on research faces as a scientific and educational principle with the student[7], in order to stimulate investigative attitudes that lead to the search for self-knowledge and restlessness for problem solving. It is up to the teacher to glimpse the corresponding empowering ways to learn to learn in the formative scenario of health/nursing.

It is still important to highlight the student's experience before entering the undergraduate program, since the research is instituted already in childhood, when the child questions about surrounding objects or circumstances, and is then interrupted when entering a traditional educational system, which is conducted by a copier, reproductive and limited teaching[5]. This finding highlights the importance of the country's educational system focusing more sharply on the early grades, fostering the investigative spirit in students, so that they open themselves to the reconstruction of their knowledge[23].

Although the integrated curriculum has the premise of leading the student to the development of investigative reasoning and allowing the learning of research at various times, continuing this process, after graduation, it will also depend on the attitude of the newly graduated towards the situation experienced at the moment the practice happens. Instigating this attitude in the novice is a constant challenge in the training process.

Limitations of this study are the context of the research, which brings the reality of only one public university in Southern Brazil. Thus, it is suggested to conduct other research contemplating other educational institutions, with different curriculum structure. However, this study contributes to the development of teaching research to nursing student, initiating the formation of the researcher still in the undergraduate program, with benefits for the profession to apply the results of the research, associating theory and practice, with consequent consolidation of nursing as a science.

FINAL CONSIDERATIONS

The experience of students trained by the integrated curriculum has encouraged the construction and reconstruction of knowledge and the relationship theory and practice. Several moments are part of the formation of investigative competence, especially in the modules that use scientific research as its main theme, besides the extracurricular activities that contributed to the learning of research in its scientific face. As a pedagogical strategy, the tutorial stood out as a learning moment for research by the educational side, in order to bring students closer to the research steps. The teaching and learning strategies revealed are usable by any curriculum formatting.

Although some students did not mention research as a priority in professional practice, there is recognition of its relevance for the development of quality care actions. In this process of learning to learn the teacher stands out as an incentive for learning research for the scientific and educational principles.

Nursing schools must continue their efforts to promote the student's educational itinerary, the investigative attitude, transforming research into daily activity, since scientific competence is not an end in itself, but contributes to the training of a critical, reflective individual and innovator of social and professional reality.

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PESQUISA COMO PRINCÍPIO CIENTÍFICO E EDUCATIVO NA FORMAÇÃO DO ENFERMEIRO

RESUMO

Objetivo: Identificar como a abordagem do tema investigação científica pode contribuir para o desenvolvimento da competência científica na percepção de estudantes do curso de Enfermagem. **Método:** Trata-se de uma pesquisa qualitativa, descritivo-exploratória do tipo estudo de caso desenvolvida em um curso de graduação em Enfermagem de uma universidade pública do Sul do Brasil. A coleta de dados deu-se por meio de três grupos focais com 23 estudantes e de análise documental. Os dados foram submetidos à análise de conteúdo e discutidos na perspectiva teórica de Pedro Demo. **Resultados:** Dos dizeres, evidenciaram-se duas categorias: "Construindo a competência investigativa: definição, importância e momentos de aprendizagem" e "A competência científica em formação: a pesquisa como subsídio para a prática profissional". **Considerações finais:** A competência investigativa para a formação do enfermeiro atribuiu-se aos arranjos curriculares, ao método da problematização, à estratégia pedagógica tutorial, ao papel do professor como ativador no processo ensino-aprendizagem em pesquisa e às atividades extracurriculares, para aperfeiçoamento da prática.

Palavras-chave: Educação superior. Pesquisa em Educação de Enfermagem. Currículo.

INVESTIGACIÓN COMO PRINCIPIO CIENTÍFICO Y EDUCATIVO EN LA FORMACIÓN DEL ENFERMERO

RESUMEN

Objetivo: identificar cómo el abordaje del tema investigación científica puede contribuir para el desarrollo de la competencia científica en la percepción de estudiantes del curso de Enfermería. **Método:** se trata de una investigación cualitativa, descriptiva-exploratoria del tipo estudio de caso desarrollada en un curso de pregrado en enfermería de una universidad pública del Sur de Brasil. La recolección de datos ocurrió por medio de tres grupos focales con 23 estudiantes y análisis documental. Los datos fueron sometidos al Análisis de Contenido y discutidos en la perspectiva teórica de Pedro Demo. **Resultados:** fueron evidenciadas dos categorías: "Construyendo la competencia investigativa: definición, importancia y momentos de aprendizaje" y "La competencia científica en formación: la investigación como aporte para la práctica profesional". **Consideraciones finales:** la competencia investigativa para la formación del enfermero se atribuye a los mecanismos curriculares, al método de la problematización, la estrategia pedagógica tutorial, al rol del profesor como fomentador en el proceso enseñanza-aprendizaje en investigación y a las actividades extracurriculares, para perfeccionamiento de la práctica.

Palabras clave: Educación superior. Investigación en Educación de Enfermería. Currículum.

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