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CONNECTIONS BETWEEN RESEARCH AND HEALTH CARE ASSISTANCE: EMERGING CHALLENGES FOR SCIENCE, INNOVATION AND TECHNOLOGY IN NURSING¹

Ítalo Rodolfo Silva², Joséte Luzia Leite³, Maria Auxiliadora Trevizan⁴, Thiago Privado da Silva⁵,
Sabrina Ayd Pereira José⁶

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² Ph.D. in Nursing. Professor, Nursing and Obstetric Course in UFRJ - Campus Macaé. Macaé, Rio de Janeiro, Brasil. E-mail: enf.italo@hotmail.com

³ Ph.D. in Nursing. Professor of the *Programa de Pós-Graduação em Enfermagem* of, EEAN/UFRJ. Rio de Janeiro, Rio de Janeiro, Brasil. E-mail: joluzia@gmail.com

⁴ Ph.D. in Nursing. Professor of the School of Nursing in Ribeirão Preto, *Universidade de São Paulo*. Ribeirão Preto, São Paulo, Brasil. E-mail: trevizan@eerp.usp.br

⁵ Doctoral Student in the *Programa de Pós-Graduação em Enfermagem EEAN/UFRJ*. Rio de Janeiro, Rio de Janeiro, Brasil. E-mail: thiagopsilva87@gmail.com

⁶ Ph.D. in Nursing. Professor in the Nursing and Obstetric Course in UFRJ - Campus Macaé. Macaé, Rio de Janeiro, Brasil. E-mail: sabrinaayd@gmail.com

ABSTRACT

Objective: to understand the meanings that permeate the connections between the production / research results and the nursing work process in the care context.

Method: explanatory style research using a qualitative approach, with theoretical and methodological references: Theory of Complexity and grounded theory, respectively. The data were collected from 25 subjects, distributed in three sample groups: ten clinical nurses linked to a university hospital; six nurse researchers and nine undergraduate nursing students. The semi-structured interview was used as a data collection technique. The research was validated by ten reviewers from different regions of Brazil.

Results: The following category is presented: Facing Emerging Nursing Challenges in the Age of Science, Innovation and Technology, based on the subcategories: Starting points for contextualized nursing: from scientific production to the utilization of research results; And Fragile connections between scientific production and nursing care practice.

Conclusion: the systems of meanings that influence the connections between scientific research and nursing care practice are structured and strengthened by plural phenomena, among which are the negative inflections of the communication process, presence and recognition between who produces research and who can use it.

DESCRIPTORS: Nursing. Science. Knowledge management. Technology. Innovation.

CONEXÕES ENTRE PESQUISA E ASSISTÊNCIA: DESAFIOS EMERGENTES PARA A CIÊNCIA, A INOVAÇÃO E A TECNOLOGIA NA ENFERMAGEM

RESUMO

Objetivo: compreender os significados que permeiam as conexões entre a produção/resultados de pesquisa e o processo de trabalho da enfermagem no âmbito assistencial.

Método: pesquisa do tipo explicativa, de abordagem qualitativa, que teve como referenciais teórico e metodológico, respectivamente, a Teoria da Complexidade e a Teoria Fundamentada nos Dados. Os dados foram coletados com 25 sujeitos, distribuídos em três grupos amostrais: dez enfermeiros assistenciais, vinculados a um hospital universitário; seis enfermeiros pesquisadores e nove estudantes de graduação em enfermagem. A entrevista semiestruturada foi utilizada como técnica de coleta de dados. A pesquisa foi validada por dez juízes de diferentes regiões do Brasil.

Resultados: apresenta-se a categoria: Enfrentando desafios emergentes da enfermagem na era da ciência, inovação e tecnologia, alicerçada pelas subcategorias: Pontos de partida para uma enfermagem contextualizada: da produção científica ao consumo de resultados de pesquisa; e Conexões fragilizadas entre produção científica e prática assistencial da enfermagem.

Conclusão: os sistemas de significados que influenciam as conexões entre pesquisa científica e prática assistencial da enfermagem são estruturados e fortalecidos por fenômenos plurais, dentre os quais estão as inflexões negativas do processo de comunicação, presença e pertencimento dos pares, entre quem produz pesquisa e quem poderá consumi-la.

DESCRIPTORIOS: Enfermagem. Ciência. Gestão do conhecimento. Tecnologia. Inovação.

CONEXIONES ENTRE INVESTIGACIÓN Y ASISTENCIA: DESAFÍOS EMERGENTES PARA LA CIENCIA, INNOVACIÓN Y TECNOLOGÍA EN LA ENFERMERÍA

RESUMEN

Objetivo: comprender los significados que permean las conexiones entre la producción/ resultados de investigación y el proceso de trabajo de la enfermería en el ámbito asistencial.

Método: investigación del tipo explicativa, de abordaje cualitativo que tuvo como referenciales teórico y metodológico, respectivamente, la Teoría de la Complejidad y la Teoría Fundamentada en los Datos. Los datos fueron recolectados con 25 sujetos, distribuidos en tres grupos muestrales: diez enfermeros asistenciales, vinculados a un hospital universitario; seis enfermeros investigadores y nueve estudiantes de grado en enfermería. La entrevista semiestructurada fue utilizada como técnica de recolección de datos. La investigación fue validada por diez jueces de diferentes regiones de Brasil. La investigación fue validada por diez jueces de diferentes regiones de Brasil.

Resultados: se presenta la categoría: Enfrentando desafíos emergentes de la enfermería en la era de la Ciencia, la Innovación y la Tecnología, basada en las subcategorías: Puntos de partida para una enfermería contextualizada: de la producción científica al consumo de resultados de investigación; Conexiones fragilizadas entre producción científica y práctica asistencial de la enfermería.

Conclusión: los sistemas de significados que influyen las conexiones entre investigación científica y práctica asistencial de la enfermería son estructurados y fortalecidos por fenómenos plurales, entre los cuales están las inflexiones negativas del proceso de comunicación, presencia y pertenencia de los pares - entre quien produce investigación y quién puede consumirla.

DESCRIPTORES: Enfermería. Ciencia. Gestión del conocimiento. Tecnología. Innovación.

INTRODUCTION

Throughout the years, the scientific and social progress of nursing has allowed its formation as a profession, academic discipline and science construction, which has advanced in the epistemological field by demanding efforts in order to reach an identifiable scope of knowledge, seeking what is specific to it, aiming to sustain and support their practices through the performance of research for the promotion, maintenance and restoration of the health of the individual and of the community.¹

Among the challenges of nursing is the need to master the skills to successfully carry out the work in the era of science, innovation and technology, which together sustain the knowledge for societal progress. This combination, as nursing is a social practice,^{2,4} is pertinent to identify starting points for its consolidation in the face of emerging social demands, especially with regard to the construction and use of knowledge. In this respect, the growing expansion of scientific productions in Brazilian nursing in recent years is highlighted.⁵

This phenomenon can be explained by comparing the production from the triennium 2004-2006, in which 3,563 articles were published, in 373 periodicals, while in the three-year period 2007-2009 a total of 5,194 articles were published, in 595 journals which shows an increase of approximately 30% of publications within three years.⁶ In the three-year period between 2010 and 2012, the amount of scientific production was even more significant. During this period, 9,206 articles were registered, corresponding to a 77.2% increase.⁵

However, it is necessary to consider the importance of scientific progress reaching possibilities that go beyond the quantitative progress of these productions, in order to consider the real impacts that the science produced exerts on nursing care, since, from the results of these impacts, academic recognition and desirable social visibility can be achieved by adjusting science with awareness,⁷ as well as the ability to feed back emerging research possibilities and intervention mechanisms.

Under these circumstances, the assumption is that nursing knowledge management should include possibilities to evaluate the convergence between research results and contextual reality, thus justifying the importance of research to clinical nurses. However, despite the fact that the research nurses require efforts to carry out studies that lead to changes in care practices, there is a need for better integrations between the scientific nursing productions and its work process in care.⁹

Therefore, it is necessary to recognize the practice of research as a foundation for nursing care, which suggests the intense involvement of clinical nurses with the research practices and results that are destined to the field of their work, while collaborating for the development and improvement of the fundamental scientific bases for the exercise and development of nursing.^{8,10} Thus, there is no way to disassociate scientific construction movements from healthcare practices.⁸ One must, however, seek strategies that strengthen the connections between these dimensions, in different contexts and in a transversal way, that is to say, from the nursing training process to health actions and care practices.

In view of the above, it is questioned: which phenomena or systems of meanings influence the connections between the scientific production of nursing and the practice of nursing care? To answer this question, the following was established as an objective: to understand the meanings that permeate the connections between the production / research results and the nursing work process in the healthcare context.

METHOD

An explanatory study, with a qualitative approach, using the Complexity Theory as theoretical reference, and Grounded Theory (GT) as methodological reference, which is a method developed from a set of analytical resources that when systematically conducted may generate a theoretical matrix explaining the phenomenon investigated.¹¹

The research participants consisted of three sample groups: clinical nurses, research nurses and nursing undergraduate students. However, it must be highlighted that, at first only the first two sample groups were delimited, as one of the characteristics of GT is the possibility of the analytic conduction of the data leads a new sample group. This is due to the fact that the data are collected and analyzed in parallel. The use of memorandums favor the formulation of hypotheses throughout the research, with the objective of attaining depth in the phenomena that emerge from the data.¹¹

Thus, the following hypothesis arose during the research: the professional nursing training is a valuable mechanism in the utilization of research of this professional. Thus, the hypothesis in question directed the structure of the sample group formed by nursing undergraduate students, with an indicative foundation that this could be the initial context for the connections between the scientific research and nursing practice care by revealing intervening factors for these connections from learning through research nursing undergraduate course.

Regarding the scenarios and research participants, it must be highlighted that knowledge management is a complex phenomenon and, therefore, rooted in multiple facets, including contexts and specificities of areas of knowledge. In the field of nursing, as a science and social practice, it is necessary to consider its different areas of practice, in which each of them may present peculiarities for the convergence between research and assistance.

In the meantime, among the fields of knowledge and intervention contexts, a specific group of

human groups is highlighted: adolescents, which in relation to the other stages of the life cycle becomes quite peculiar in the field of knowledge, there is the need for scientific constructs pertinent to this phase of life, since the conception of the existence of an intermediate period between child and adult is recent.¹² Therefore, knowledge management can be used to improve this area as it appears to be important social demand.

Based on this understanding, a research center of a university hospital focused on health and adolescent development, located in the capital of Rio de Janeiro (Brazil) was used as the research location for the clinical nurse group. The activities developed in this research center cover health care at primary, secondary and tertiary levels, as recommended by the Brazilian Unified Health System (SUS). As for the research nurses, research groups registered in the Directory of Research Groups of the National Council for Scientific and Technological Development (CNPq), linked to the universities of Rio de Janeiro were chosen for participation. The third location, corresponding to the group of undergraduate students, was at the nursing course of a federal public university in Rio de Janeiro.

In order to select the group of clinical nurses, the following inclusion criteria were included: to have professional experience as a nurse in the current location for at least one year or more. The exclusion criteria included: nurses who were studying in a *stricto-sensu* postgraduate program. For the research nurses group, the inclusion criteria included: to have a doctorate degree, and to be linked to a research group registered with CNPq, where one of its lines of research presented a theme related to adolescent health.

Nurse researchers with PhD degrees who had less than two years of experience in research management were excluded. For the third sample group, the inclusion criterion included: to be attending the last year of the nursing undergraduate course; and the exclusion criterion included: to be a student who was included in a research group of another professional category.

After the criteria were applied, the following sample composition was obtained: 25 research participants, of which ten were clinical nurses, six were nurse researchers and nine were undergraduate nursing students.

The selection of the participants was intentional and was guided by the theoretical sampling of GT, which is to maximize opportunities for fact comparison, incidents or events to determine how

a category varies in terms of its properties and dimensions.¹¹ The data collection was finalized upon theoretical saturation, i.e. when the categories presented explanatory density capable of responding to the research problem.

The recruitment of clinical nurses and undergraduate students was performed intentionally

using the snowball technique, which consists of the subject participating in the research indicating the next participant. In order to select the nurse researchers, a parameterized search was performed using the *Lattes* Platform, in the CNPq Research Groups Directory, using the strategies presented in the table 1:

Table 1 - Parameterized search for the selection of research groups

Group selection:
<ul style="list-style-type: none"> • Search term: "adolescent", "adolescents", "adolescence" • Search option: "any word"
Other search filters:
<ul style="list-style-type: none"> • Search option: "name of group" • Group Situation: "certified" • Region: "southeast" • State: "Rio de Janeiro" • Area of knowledge : broad area - "health sciences"; area - "Nursing"

Source: current database of the Directory of Research Groups of the National Council for Scientific and Technological Development (CNPq) Brazil, 2015.

After selecting the research groups, each researcher was invited participate by electronic correspondence through the e-mail registered in the *Curriculum Lattes* platform. The semi-structured interview was used as a technique for data collection in all groups and was performed from October 2014 to March 2015, and recorded using digital media. On average, each interview lasted about 55 minutes. The main research question for the clinical nurses was: tell me how you understand the relationship between scientific research and your work process. For the research nurse group, the main questions were: tell me about your understanding about the participation of clinical nurses in nursing research development; and what strategies do you use to enable your research results to be used by caregivers? For the nursing student group, the main questions were: how do you understand the relationship between scientific research and your training process? From your experience in the undergraduate degree, how do you perceive the relationship between research and the work of the clinical nurse? Based on these questions, circular questions were asked so that the statements met the demands which could deepen the investigated phenomenon.

The interview were performed in reserved environments. The interview and data collection location for the nurse researcher group was the teaching institution to which they were linked to.

Data analysis was based on the coding process, which in GT consists of a comparative analysis process at three levels - open, axial and selective.¹¹ In the open coding, the concepts were identified through comparisons between data properties and dimensions. At this stage the preliminary codes emerged from the titles assigned for each incident, idea or event and after their emergence the comparisons began to be grouped into conceptual codes.¹¹

In the axial codification, the conceptual codes were grouped to form the categories and subcategories.¹¹ In this analytical stage, the process of regrouping the data which were separated in the open coding, aiming at a dense explanation of the phenomenon.

The selective codification consisted of the comparison and analysis of the categories and subcategories, a continuous process that aims to develop the categories, to integrate and refine the theoretical matrix and to make the central phenomenon emerge.¹¹

The categories were ordered according to the paradigmatic model,¹¹ which allows for an explanatory coherence between the dimensions that support the investigated phenomenon. Its structure is based on the following components: phenomena, causal conditions, intervening conditions, context, strategies of action / interaction and consequences.

Following the formation of a grounded theory the results of the research were validated by ten re-

viewers, which including: research nurses linked to research groups registered with CNPq, most of them leaders of these groups, from different regions of the country, with expertise in the field of adolescent health and renowned experience in research management. The same strategy was used as described in table 1; however, refinement was increased to all regions of Brazil. Researchers from research groups from each Brazilian macro-region were selected i.e.: South, Southeast, North, Northeast and Central West. This last region was not selected because there was no return from the selected group. The distribution of reviewers by region resulted in the following composition: three from the North, three from the Northeast, one from the Southeast and three from the South.

In order to select the groups from which the reviewers emerged from, the following criteria were established: analysis of the human resources of the groups, based on data contained in the Directory of Research Groups of CNPq, considering the heterogeneity of the members (researchers, undergraduate students, specialization, clinical nurses), as well as the academic production of the selected reviewers, which importance on research projects. The group leaders were first to be invited, but they were allowed to nominate another member(s) for validation purposes.

The validation material consisted of a compact booklet consisting of two parts: the summary of the results of the research and the validation instrument. In the latter, the adjustment criteria were used as analysis parameters: (theory capability / conceptual model to adapt to the investigated reality) comprehension (comprehension of the meanings that the concepts show) and theoretical generalization (ability to make a theory / conceptual model applicable in similar contexts from which the investigated phenomenon emerges).¹¹ Each judge could describe their evaluation by using three options for each criterion: fully corresponds, partially corresponds and does not correspond. It was necessary to justify each response.

In order to facilitate validation and bring reviewers and researchers together, a room was made available at the 18th National Seminar on Nursing Research (SENPE), which took place in Fortaleza-CE, in June 2015. Formal authorization to use the room was given from the Director of Nursing Research of the Brazilian Nursing Association (ABEn).

The choice of this room was due to the context of the scientific event and to establish a connection with the object of the study, since the central theme

of the Seminar was outlined as "Nursing research: applicability, implications and visibility". The judges who could not attend the seminar sent the analyzed material to the researcher via post.

The results that structure the theoretical matrix were validated. In all the criteria, the judges reported adherence to the context of their realities. However, they considered it important to adjust the titles of some categories, as the terms used were directed towards the specificities of the Complexity Theory. Based on this indication, some titles have been modified. It must be highlighted, for the generalization criterion, the judges highlighted that the gaps between research and care, despite having specifics in relation to the field of knowledge of adolescence, showed transversality with other fields of knowledge and intervention, corroborating with the search results.

The research was approved by the Research Ethics Committee (CEP) of the Anna Nery School of Nursing - Federal University of Rio de Janeiro (UFRJ), under protocol N. 6665.516 / CAAE: 30438114000005238, and by the CEP of the University Hospital Pedro Ernesto, of the University of the State of Rio de Janeiro (UERJ), under protocol N. 686,612. The researchers complied with Resolution N. 466/12 of the National Health Council. Participation of the subjects occurred voluntarily, after clarification and signing of the Term of Free and Informed Consent (TCLE). To maintain the anonymity, the study participants were alphanumerically ordered, according to the source sample group and the sequence of the interview. Thus, for the 1st group (Eanumber - Clinical Nurse) for the 2nd group (EPnumber - Nurse Researcher) and for the 3rd group (EGnumber- Undergraduate Student).

RESULTS

After the validation process, the central phenomenon of the theoretical matrix, structured from the set of categories, was represented as: Connections for a living nursing science. However, the category which, in the use of the paradigmatic model, is configured as a causal condition of the investigated phenomenon will be discussed in this article, because, as a whole, it sustains the importance of the connections between research and nursing care.

From this perspective, we present the category Facing emerging challenges in nursing in the age of science, innovation and technology. It is based on the following subcategories: Starting points for contextualized nursing: from scientific production

to the utilization of research results and Fragile connections between scientific production and nursing care practice.

Starting points for a contextualized nursing: from scientific production to the consumption of the research results reveal the demands of the market systematics, with regard to the current scientific and technological developments, which require nursing skills in the emerging configurations of health systems and care.

This process reflects on the need for scientific knowledge and skills in order to improve the practice of the profession, which may result in impacting nurses' utilization, as portrayed in the following sections:

I think the motivation to research is because the work has changed, the profile of the patient has changed, the profile of the devices, the hospital technology [...]. The patient has more access to information [...]. The patient's family is more informed, everything influences (EA6).

[...] the demand for care by the consumer, the user of the health system, has also strongly encouraged nurses to seek more knowledge (EP4).

Based on the above, it can be seen that the researcher's use of research is connected to his / her interest and need to apply the knowledge to the practice of care, thus permeating the potential contemplative field of research, while searching for praxis in its context of innovation and technology, as shown below:

the clinical nurse uses research but about technology, innovation. There has to be some result brought to the practice (EP1).

[...] we should realize the need for scientific innovations in our practice and I do not see this happening (EA5).

Regarding the management of nursing care, the consumption of research is closely related to the decision-making process, in spite of the scientific support and confidence to base their choices and ensure a practice based on the best scientific evidence. However, the results revealed challenges to this reality.

Often, we find no support for decision making, or to give continuity to certain things that have no basis yet and on account of that, you feel that you are on the tightrope, not knowing what to do (EA1).

I think if we had more research, I'm sure people would look for more, and then we would have more to base the decision on (EA3).

The difficulty of nurses in accessing research results, with a view to the foundation of their actions for decision making, implies the search for and use

of other knowledge bases, among which empiricism and subjectivism.

[...] people do a certain action because they are used to performing that action and not because of the scientific proof that justifies the action (EA5).

[...] everything starts to get very empirical, I think you'll get lost in the middle (EA1).

Lack of autonomy and positioning in the multi professional health care team are among the negative consequences of the clinical nurses lack of research, leading to uncertainties, insecurity and lack of motivation.

[...] the doctor arrives and, just because he is the doctor, what he says is understood that is it, no one questions or doubts him. Nurses need to assert themselves more (EA8).

The nurse who is not up to date, who cannot back up arguments, her self-esteem decreases and is underestimated because she does not know how to talk to her peers, her subordinates [...] or other members of the multiprofessional team (EP2).

On the other hand, it should be pointed out that when the clinical nurse is faced with these situations, the clinical nurse recognizes the need to research.

It would be wonderful if, I could make contributions to the meetings by using studies produced by nursing professionals (EA7).

From the moment that the nurse and the nursing team are willing to acquire scientific knowledge, to make scientific knowledge something palpable, accessible, familiar, to master this knowledge - the position of the nursing team, in the perspective of the multidisciplinary team, and especially in the perspective of medicine, will be something more participatory (EA9).

The multidimensionality involved in the difficulty of research by clinical nurses in addition to other factors, consists of weak connections between scientific production and nursing care practice. In the meantime, as it is a multifaceted phenomenon, the field of Connections between research and care practice encompasses aspects that converge so that clinical nurses perceive scientific production in nursing as a reality far from their own and that, in a causal relationship or effect, interferes very little with their work process.

[...] I think that very little of which is produced is relevant to the nursing work itself (A12).

We comment during the work routine that nursing research gives the impression that it isn't significant, because when they do not reflect on changes in the everyday work of nurses, why bother doing nursing research? (EA9)

[...] *it seems to us that the research is only done for the sake of publications, because you have to produce! Sometimes about themes and discussions which are out of reality* (EA6).

The training process in the undergraduate course is among the mentioned possibilities which strengthen the connections between research and assistance, whereby, the student has the possibility to relate the importance of research with their future work process in the health care network, this can be evidenced in the following sections:

[...] *when we see that research has a purpose for nurses' practice, it becomes easier and more enjoyable to understand the research disciplines that we study in the course* (EG9).

[...] *the research group helps a lot because we also have clinical nurses who talk about the importance of research* (EG3).

Despite the specificity in the field of knowledge and intervention in which the clinical nurses of this research are part of, the distancing between scientific production and nursing care is not limited to the scenario of adolescent care, as highlighted:

[...] *this is a general reality, not just about the adolescent* (EA4).

there is a difficulty in finding research about the whole scope of nursing, not only in relation to the adolescent, that is what I see (EA10).

The weaknesses of these connections are in line with what nursing researchers and nursing undergraduates also perceive:

[...] *I see that research does not bring the return it should to practice. It benefits the undergraduate student, or those who are doing the masters or doctorate degree* (EP5).

[...] *the problem is in the objectives, in the proximity between people and in the interaction to change together* (EP6).

I think this is very fragmented in nursing, there are people who research, who understand about the subject, who say, for example: you do in the "x" way, but the "y" way seems much more obvious to me, but they are not the people who are on the bedside (EG1).

To this day I have not seen much of this relationship between research and assistance (EG5).

The communication between those who produce research and the potential users of scientific results emerges as an important intervening element for the connection between these dimensions, since it allows conditions for the necessary feedback in the field of perception, valuation and adherence by the clinical nurses regarding the results of research in their practices.

There is no communication, no feedback [...]. I think we created such a big gap that communication got lost (EA2).

[...] *there is a communication gap in these two strands* (EG8).

The distance between the researcher and the nursing care field, in the perception of clinical nurses, seems to affect the feedback needed to consolidate research as an image in the subject/object relationship. Therefore, they believe that this phenomenon is reflected in the distortion of reality, as shown below:

the researcher should be more present in the field, because they distance themselves from the practical field more and more., this environment ceases to be their reality and therefore they cannot identify the problems (EA1).

it's not that the nurse researcher needs to stay at the bedside, but it would be interesting if he stayed on the scene [...] to be a more accessible person (EA5).

it would be helpful if the nurse researcher discussed with the team what the group really needs (EA6).

Thus, the connections between the dimensions of scientific research and care practice seem to be hampered by the negative inflections of the process of communication, presence and recognition- between who produces research and who can use it.

DISCUSSION

Science, innovation and technology are interdependent and complementary dimensions of a process that aims at the social, political and economic development of the nations¹³ and, consequently, at the overlapping mechanisms in this context, from which the professions as structuring elements of society are results.

Thus, emerging nursing challenges, based on the results presented, point to the demands of individuals and collectivities that experience, among other factors, possibilities of access to information, as well as to artifacts and technological processes and Innovation.¹³ Therefore, in a dynamic perspective, they target intervention mechanisms in the field of nursing and society as they demand solutions to emerging health and care needs.¹⁴⁻¹⁵

In order to discuss this phenomenon, it is necessary to globalize it, since the essential problems of humanity are never partial, but multidimensional and inserted in a context, without which it would not be possible to reach their reality.⁷ Thus, In addition to scientific advances, such as the development of robotics and genetic engineering, the evolution of science and technology in recent years has led

to the development and access to Information and Communication Technologies (ICT),¹⁶ in different strands, with emphasis on the internet and the virtual media network, which also influence health and nursing care systems.¹⁷⁻¹⁸

As a result of this process, in addition to the aforementioned issues related to digital inclusion, a new consumer profile of health services that, when accessing information, may find possibilities to exercise their rights of citizenship in the midst of the programmatic disorders of health systems that tangle social vulnerabilities, especially for inefficient access and accessibility to health services, sometimes aggravated by the unavailability / non-conformities of information to the consumers of this system.¹⁹ In view of the new panorama of consumers of health services, we seek an understanding of the signs highlighted by the nurses participating in the study regarding the reasons that motivate them to use research-associated, consequently, to the need for scientific knowledge. However, the motivation for this consumption is based on the procedural and product character of the technologies¹⁴ envisaged in scientific research as elements that arouse the clinical nurse's interest in consuming them.

However, it is necessary to think about and enable the development of competencies so that nurses can efficiently use ICTs for the benefit of their work process, which includes the utilization of research. Therefore, it is necessary that these issues be included in all the actions and strategies permeated in the permanent education of the institution where this professional works.

The emerging nursing challenges also need to guarantee the legitimacy of their autonomy.²⁰ Regarding this, the results point to the importance of nurse empowerment by scientific knowledge. It is worth noting the emphasis that clinical nurse attribute to the comparison with medicine, when dealing with the valuation of knowledge in professional performance.

In this reality, the professional devaluation and wear and tear within work relations can be seen, as well as negative impacts on health care.²¹ On the other hand, these relations can be horizontalized by the authority of the argument,²² which, in this context, corresponds to the argumentative capacity founded and manifested in scientific knowledge, without interfering in the expression of the legal exercise of each profession.

Thus, according to the results, the teaching of science, in the context of undergraduate studies, exerts an important influence on the development

of nurses' vision of research as a foundation for their professional practice, a fact that supports the importance of teaching science in this stage of professional training. However, this phenomenon cannot be understood from a unilateral perspective, justified only by scientific empowerment, because it is also a result of the historical and political context from which the health professions emerge and sustain themselves.^{9,20-21}

An element that calls for the authority of the argument²² is decision making, a competence required in the nursing work process. This dimension of nursing management may be impaired when the rationale for nurses' positioning is weakened in the field of scientific knowledge.²³ Such a problem is aggravated by the demands of the market, which require sound decisions at ever decreasing intervals,²⁴ in which access to information, and the ability to decode the information are conditions to ensure the nurses in their decision-making process. However, scientific knowledge is not always the structuring element of this process,²⁵⁻²⁶ as subjectivism and empiricism are the guiding axes of decisions.²³

The understanding of these mechanisms, in the perspective complexity, cannot be considered in isolation, since the relationship between the production of subjectivity and the decision-making process of the nurse is mediated by the contextual macro and microculture, power and capitalism that manifest in the individual reflexes of the community.²⁷ In addition, studies^{23,25} identified an inversely proportional relationship between practical experience / training time and the valorization of the theoretical basis, through the use of research for the decision-making process of the nurse, which reveals gaps between scientific practice and empiricism in the conduct of the nursing work process, aggravated by the difficulties of adapting to new technologies for knowledge and professional development.

This reality also emerges as a challenge for institutional management, given that the human capital of excellence of an institution should be adapted to the demands of the public whose services are intended for.

Taking knowledge as a plural phenomenon, the Complexity Theory⁷ establishes connections with the Knowledge Theory itself,²⁸ when considering that the origin and possibility of knowledge is tangented by the experience and thinking of the subject, while it highlights the question: where does the cognitive consciousness base its efforts to obtain knowledge? Is it in experience or in thought?²⁸ In fact, the discussion about rationalism and em-

piricism is resumed, from where one starts from the divergence in search of a dialogical one, since knowledge itself is constituted from connections, as it is in itself, multidimensional.⁷

Therefore, given the various possibilities to reach or obtain the image or the essence of knowledge, it is necessary to recognize the complexity of knowledge itself, not in the sense of completeness,⁷ but in the appreciation of the multiple aspects that can complement each other, reaching the knowledge of knowledge. Thus, one can move from *doxa* (opinion) to *episteme* (knowing)^{1,28} and, perhaps, in a more objective work process, connect the results of research to the tacit knowledge of the nurse. In order for this to be feasible, it is essential that the connections between research and care practice, as well as between nurse researchers and care nurses are narrowed.⁸

Of course, this movement involves engaging the care and academic dimensions. Thus, nursing science must be produced in the relational perspective between the different social actors that constitute this profession, as well as the different contexts, in order to break the polarization of research in the university field.²⁹

However, it is fundamental to develop and / or improve strategies that make it possible to transform research results into care policies. Therefore, it is necessary that nurse researchers / scientists and clinical nurses consciously assume the challenge of science together⁷ when establishing an organic relationship with society³⁰ and thus, reach the sense of inertia between the researches produced and the demands of the nurses' work process faced with the contemporary challenges of science, innovation and technology.

CONCLUSION

The research reveals systems of meanings and phenomena that influence the connections between scientific nursing research and the utilization of these results by the nurse in the assistance area. Thus, it considers that the utilization of nursing research, by clinical nurses is a necessity that meets the emerging demands of health and care, especially with regard to science, innovation, technology for the development of society, as well as for the professionals involved.

The utilization of research by clinical nurses is related to the meanings attributed to nursing scientific production, as well as to the research process itself. In turn, these meanings can be positively influ-

enced when there is a return of research, produced by nursing to the field of care, whether in process format or product form. In fact, the distance and / or approximation between what is produced in terms of science and what is used by nursing points to the importance of strategies that enable better connections between research and the nursing work process. In spite of this reality, the training process, within the undergraduate course, was pointed out as an important context in which the initial connections between the development of research and the assistance dimension are woven and strengthened.

The results direct and strengthen the perspective that the development of nursing, as a science under construction, requires a systemic understanding regarding the real impacts of the research produced by nursing to the health care field. In fact, with this understanding, clinical nurses and research nurses will strengthen strategies that guarantee connections between what is produced as science, which research is used, and what is applied to practice.

It is worth mentioning that, although this research has supported the hypothesis that the context of adolescence presents specificities for the challenges in the connection between nursing research and nursing care, the results and the validation process strongly demonstrate that in general, these challenges occur transversally in nursing. However, the replication of this research in different intervention scenarios may strengthen or refute the data which presented the reality as transversal in the context of adolescence.

Among the potential limitations of the research, the understanding that similar studies in private institutions, both in the context of care and teaching, may present different results to what was found in this study, giving reason for research of this magnitude in these other contexts.

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