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PARADIGMATIC INFLUENCES ON TECHNICAL NURSING EDUCATION

Influências paradigmáticas na formação docente de nível técnico do enfermeiro

Influencias paradigmáticas en entrenamiento de profesores de nivel técnico de enfermería

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ABSTRACT

Objective: The objective of this work was to quantify the number of scientific publications on technical nursing education over 20 years (1996-2016) and discuss them in light of the ecosystem paradigm. **Methods:** This integrative literature review with a descriptive-exploratory approach was performed using the following online databases: *Biblioteca Virtual em Saúde* (BVS) [Virtual Health Library], *Literatura Latino-Americana e do Caribe em Ciências da Saúde* (LILACS) [Latin American and Caribbean Health Sciences Literature], MEDLINE, and *Índice Bibliográfico Espanhol de Ciências da Saúde* (IBECS) [Health Sciences Spanish Bibliographical Index]. The sample consisted of five articles that were selected after applying inclusion and exclusion criteria. Descriptive statistical analysis was used to describe the selected articles. Collected data was subject to thematic content analysis. **Results:** The following category was elaborated: "The influence of the Cartesian model on technical nursing education". **Conclusion:** There is an emerging need to rethink

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old paradigms and insert new conceptual perspectives on technical and vocational education to support the training of nurse technicians.

Descriptors: Professional education, Technical nursing education, Ecosystem.

RESUMO

Objetivo: Quantificar a produção científica publicada nos últimos 20 anos, sobre a formação técnica em enfermagem e discutir com base no paradigma ecossistêmico. **Método:** Trata-se de uma revisão integrativa realizada via *online* na Biblioteca Virtual em Saúde nas bases de dados da Literatura Latino-Americana e do Caribe em Ciências da Saúde, Índice Bibliográfico Espanhol de Ciências da Saúde e Medical *Literature Analysis and Retrieval System Online*. A amostra constituiu-se de 05 artigos científicos completos selecionados observando os critérios de inclusão e exclusão. A descrição dos artigos foi realizada por análise estatística descritiva e os dados, foram analisados por análise de conteúdo na modalidade, análise temática. **Resultados:** Emergiu uma categoria, assim especificada: A influência do modelo cartesiano na formação técnica em enfermagem. **Conclusão:** Aponta-se uma emergente necessidade de repensar velhos paradigmas e inserir novas perspectivas conceituais para a Educação Profissional que fundamentem a formação do técnico em enfermagem.

Descritores: Educação Profissional; Educação Técnica em Enfermagem; Ecossistema.

RESUMEN

Objetivo: Cuantificar la producción científica publicada en los últimos 20 años, sobre capacitación técnica en enfermería y debatir en base al paradigma ecosistémico. **Método:** Es una revisión integradora realizada en línea en la Biblioteca Virtual de Salud en las bases de datos de Literatura Latinoamericana y del Caribe en Ciencias de la Salud, Índice Bibliográfico Español de Ciencias de la Salud y Sistema de Análisis y Recuperación de Literatura Médica en línea. La muestra consistió en 05 artículos científicos completos seleccionados, observando los criterios de inclusión y exclusión. La descripción de los artículos se realizó mediante análisis estadístico descriptivo y los datos se analizaron mediante análisis de contenido en la modalidad, análisis temático. **Resultados:** Surgió una categoría, como sigue: La influencia del modelo cartesiano en la formación técnica en enfermería. **Conclusión:** Hay una necesidad emergente de repensar viejos paradigmas e insertar nuevas perspectivas conceptuales para la Educación Profesional que subyacen en la capacitación de los técnicos de enfermería.

Descriptores: Educación Profesional; Educación técnica en enfermería; Ecosistema.

INTRODUCTION

Education is a complex and multidimensional process[1] both related and influenced by social, cultural, economic and political transformations within the context of the student's insertion, influencing and being influenced by health conditions,[2] allowing the association between empirical and scientific knowledge, and requiring a broad, holistic and integrated view.

The holistic understanding of education as a multifactorial element differs from the traditional method of professional training, which was focused on the satisfaction of the intrinsic capitalism in the world society, fragmenting education through over-specialization and excessive pursuit of productivity centered on profit. This requires mastery of methods and techniques, as well as effectiveness and efficiency in educational processes aiming at training professionals so that they can satisfy the needs of the market by applying practical skills.

Given this framework, technical education has been seen as a faster training alternative and a gateway to the labor market. Nevertheless, it must not only meet the students' needs but also the requirements of the regulatory agencies of the Brazilian educational system.[3] Accordingly, educational institutions must comply with the *Lei de Diretrizes e Bases da Educação Nacional* (LDB) [Law of Guidelines and Bases for Brazilian Education] and the Resolution No. 6 of the *Diretrizes Curriculares Nacionais para a Educação Profissional de Nível Técnico* [Curricular Guidelines for Brazilian Technical Education], September 20th, 2012, which defines the curricular guidelines for technical education at the high school level. The following guiding principle stands out among those present in these guidelines:

> *"Inseparability of education from social practice, considering the historicity of knowledge and learning subjects; inseparability of theory from practice in the teaching-learning process; interdisciplinarity ensured in the curriculum and pedagogical practice, aiming at overcoming the fragmentation of knowledge and segmentation of the curricular organization".*[4:2]

Despite the advances in terms of changes that led to the offer of education with integrative bases and principles, as well as several other scientific fields, professional education has been still influenced by the Cartesian/mechanistic/reductionist model.[5] Moreover, due to its historical heritage, professional education has been considered to have low quality and be targeted at underprivileged classes, orphans, and despised people.[6] Professional education was used for a long time as a welfare tool with the purpose of serving the dominant classes.

Corroborating this idea:

> *"The term 'professional education' introduced an ambiguity with regard to the basic understanding of education, leading to the reductionism of understanding education in its broadest sense and interpreting its activities as professional training".*[7:11]

Considering the above-mentioned, technical nursing education is emphasized. Technical nursing education has been influenced by the fragmentation of care, duties, responsibilities, and competences. Nursing professionals are divided into the following categories: midwives, nursing assistants, nurse technicians, and registered nurses.[6]

The proliferation of technical nursing courses in Brazil was caused by market shortages and influenced by changes in the socio-economic profile of the population. These changes were accentuated in the 1950s with the creation of hospitals. In this scenario, interest in public health was weakened

and the focus was directed toward hospital care from a perspective of individual and curative care.[6]

Historically, the elements of education have been used by workers as tools to obtain liberation paths even in adverse working conditions.[8]

The first technical nursing courses were created in Brazil in the 1960s, but only in 1971 with the promulgation of Law No. 5.692, which established the core guidelines for elementary and high school education and the proposal of mandatory professionalization, that these courses were included in the high school education system.[6] It is important to emphasize that recognition of these professionals only occurred a decade later with the promulgation of Law No. 7.498, modified by the Decree No. 94.406, 1987, which regulated the legal exercise of nursing.[9,10]

Even with the emerging changes that were brought about in order to meet the socio-economic needs in Brazil, little thought was given to the pedagogical training of nurses, resulting in a great influence of the traditional pedagogy on nursing vocational education. Some authors[11] affirm that nursing education was marked by decontextualized and unimportant academic disciplines and mere transmission of knowledge.

Therefore, it is highlighted that the democratic educational model does not present the educator as a mere transmitter of information, the focus is on the learner. In this sense. Instead, the educator is seen as a facilitator and a mentor. However, educational practice must be based on the use of students' knowledge to develop a dialogical, reflexive and transforming language.[12]

In this regard, considering the factors that influence technical nursing education, it is necessary to contextualize it within the time/space in which it develops, in other words, in the light of ecosystemic thinking. Systemic/ecosystemic technical nursing education may be considered as a system composed of a set of interdependent elements which seek to induce changes in the performance of these professionals in an interrelated and integrated way.[13,14]

Based on this contextualization, the following research question was elaborated: "How does the mechanistic model influence the training of nurse technicians and how the systemic paradigm can generate changes in this training?".

OBJECTIVE

The objective of this work was to quantify the number of scientific publications on technical nursing education over 20 years (1996-2016) and discuss them in light of the ecosystem paradigm.

METHODS

This integrative literature review with a descriptive-exploratory approach was peformed with the objective of obtaining and synthesizing search results, providing a deeper knowledge of a selected subject, which in this study is technical nursing education.[15]

Aiming to quantify the number of scientific publications addressing the subject, a literature search was performed using the following databases: *Biblioteca Virtual em Saúde* (BVS) [Virtual Health Library], *Literatura Latino-Americana e do Caribe em Ciências da Saúde* (LILACS) [Latin American and Caribbean Health Sciences Literature], MEDLINE, and *Índice Bibliográfico Espanhol de Ciências da Saúde* (IBECS) [Health Sciences Spanish Bibliographical Index]. Additionally, the following *Descritores em Ciências da Saúde* (DeCS) [Health Sciences Descriptors] were used: *educação*, *educação profissionalizante*, *educação técnica em enfermagem*, and *ecossistema*. Inclusion criteria were articles published in Portuguese, English and Spanish from 1996 to 2016 and articles freely available online in full, as can be seen in **Table 1**.

The literature search took place in November 2016. This temporal cut-off was established because Law No. 9.394 (LDB) was sanctioned in 1996.[16]

Table 1 - Data collection.

Database	*educação* No.	*educação* AND *educação profissionalizante* No.	*educação* AND *educação profissionalizante* AND *educação técnica em enfermagem* No.	*educação profissionalizante* AND *educação técnica em enfermagem* AND *ecossistema* No.
MEDLINE	339.639	1,658	0	0
LILACS	40.000	254	21	0
IBECS	8.552	61	0	0
Total	388.191	1,973	21	0

Source: Research data from MEDLINE, LILACS and IBECS online databases.

It is observed that no results were found using the descriptor *ecossistema*. After removing it from the query, a sample of 21 articles was obtained.

After reading each abstract carefully, five articles were excluded because they did not address the study subject and 11 articles were excluded because they were not available online. Hence, a total of five articles were read in full and analyzed here. To facilitate data collection, an instrument was built to record any relevant information found in the selected articles.

Descriptive statistical analysis was employed to describe and quantify the articles according to their nature. Thematic content analysis was performed in order to group the articles by content resemblance.[17]

Concerning the ethical aspects, the authorship of the articles available in the BVS was respected. Copyright Law was respected with the use of direct and indirect citations.

RESULTS

Table 2 provides better visualization of the collected data. They were organized by article number, year of publication, objectives, methodology, and main findings.

Table 2 - Overview of the selected studies.

Article number	Year of publication	Objectives	Methods	Main findings
I	2008	Describing the main changes over the last ten years that occurred in technical and vocational education at the high school level.	Not described	Technical health education at the high school level, especially in nursing, has been building a new discourse over the ten years that the LDB has been in force: training professionals for work. It is necessary to analyze and reorganize the nursing practices, build and rebuild new course plans with the purpose of training professionals so that they have the basic skills to remain in the world and at work, as well as a new look at the health practice based on the principle of completeness and humanization of care and commitment to health promotion at all levels of care services.
II	2011	Understanding the critical-emancipatory potentiality of competence according to the Brazilian Ministries of Education and Health.	Descriptive-exploratory study with a qualitative approach; data collection was done through documentary analysis; data analysis was performed in light of dialectic hermeneutics.	By considering competence as a way of structuring vocational education, it maintains its economic, non-historic, and individualizing perspective, reiterating the uncritical view of reality that a present in curricula and contradicting the emancipatory perspective of the training of workers.
III	2013	Identifying and characterizing the scientific publications carried out by researchers of *stricto sensu* postgraduate programs in Brazil from 1994 to 2011.	Descriptive-exploratory study, with a qualitative approach; data collection was performed using Microsoft Excel; data analyzed by means of the content analysis technique based on Bardin's theoretical framework.	In the period studied, the results indicated an increase in the number of dissertations and thesis addressing technical and vocational nursing education.
IV	2014	Analyzing the approaches used in scientific publications through summaries of the 12th and 13th National Seminars on Guidelines for Nursing Education, which addressed technical and vocational nursing education at the high school level.	Documental, retrospective, quantitative and qualitative study; data analyzed by means of the content analysis technique based on Bardin's theoretical framework.	There were found a few scientific publications addressing technical and vocational nursing education at the high school level. The need to rethink why this subject is little studied was evidenced, as well as the researchers' disinterest in nursing. Thus, we should effectively continue improving the quality of the political pedagogical projects that include vocational courses and the nurses' teaching skills within this context.

Article number	Year of publication	Objectives	Methods	Main findings
V	2015	Identifying the learning needs of students receiving technical and vocational nursing education.	Descriptive-exploratory study with a qualitative approach; Data collection was performed using culture distinct groups and sociodemographic questionnaires; data analyzed by means of the content analysis technique based on Bardin's theoretical framework.	It is urgent to search for teaching tools that provide interdisciplinarity according to the students' reality and help the training of the teachers so that they can work in technical and vocational nursing education. With a view of training ethical, critical, and reflexive nurse technicians who are committed to social transformation and work to achieve not only the cure of diseases but also prevention and promotion of health, it is necessary to rethink the contents taught and the ways of teaching since basic education, as well as the training of the teachers who work in technical and vocational nursing education.

Source: Research data from MEDLINE, LILACS and IBECS online databases.

Considering the publication year, one article (20%) was published in 2015, one (20%) in 2014, one (20%) in 2013, one (20%) in 2011, and one (20%) in 2008. The proportionality of publications on the subject over the years was perceived. Nonetheless, it is not possible to point out the reasons why a small number of scientific publications were found in the chosen databases.

In relation to the objectives of the studies, it was evident that one (20%) article sought to describe the main changes over the last ten years that occurred in technical and vocational education at the high school level; one (20%) article sought to understand the critical-emancipatory potentiality of competence according to the Brazilian Ministries of Education and Health; one (20%) article sought to identify and characterize the scientific publications carried out by researchers of *stricto sensu* postgraduate programs in Brazil from 1994 to 2011, one (20%) article sought to analyze the approaches used in scientific publications through summaries of the 12th and 13th National Seminars on Guidelines for Nursing Education, which addressed technical and vocational nursing education at the high school level; and one (20%) article sought to identify the learning needs of students receiving technical and vocational nursing education.

Concerning the methodological approach, three (60%) articles used a qualitative approach, one (20%) used a quali-quatitative approach, and one (20%) did not report the methodology used. Regarding the data collection method, three (60%) articles used documental search, one (20%) used culture groups and one (20%) did not report any method. It is noteworthy that four (80%) articles used public documents and/or scientific publications as a means to obtain information and only one (20%) was carried out in the field.

With regard to the method used for data analysis, three (60%) articles used the content analysis technique based on Bardin's theoretical framework, one (20%) used dialectic analysis and hermeneutics, and one (20%) did not report any method. All of the articles were published in Brazilian journals.

DISCUSSION

According to the study findings, the influence of the traditional/mechanistic model on education and have significant repercussions for the nurse technician's work. Health education is transformed by professional market trends and the dynamic and continuous influence of social, political and economic contexts.[18]

Given this approach, we will discuss the consequences of this training model and the possibility of using the ecosystemic paradigm as a support for possible changes in the training of these professionals. All political, economic, social, and environmental changes that are gradually and permanently taking place in all segments of society influence various educational areas and the training of health care workers. In this sense, attention should be paid to vocational nursing education at the high school level, which has been established as an indispensable element during discussions on education over the years as these professionals are necessary for health facilities.[3]

Some cultures, like the Western one, have been influenced by a paradigm that began to be developed in the 16th and 17th centuries, more specifically in the period between 1500 and 1700, culminating with transformations of peoples' values worldwide, as well as transformations in their way of thinking, acting, and visualizing the world.[13,14] The characteristics of the Cartesian model are reductionism and fragmentation,[13] which have been influencing medical practice. It has given rise to the biomedical model, in which care is delivered to a body seen as a complex machine that needs to be examined by a specialist.[19]

Therefore, some authors elucidate that:

> *"The biological phenomenon is explained by chemistry and physics. So, within this structure, It does not seem to be space for social, psychological, and spiritual issues [...]. The biomedical model does not see the body as a perfect machine, but as a machine that has or will have*

problems, which only specialists can verify. Thus, the way was opened for the fragmentation of knowledge".[20:44]

Considering this standpoint, developing technical training in nursing capable of overcoming the Cartesian model is challenging due to its long-lasting influence on educational models. The LDB[16] seeks to overcome this paradigm by establishing that citizens should receive education in order to possess not only practical skills but also a global understanding of the productive process, valuation of the work culture, among other important contributing aspects to professional performance. Therefore, even with this focus, the health care workers' performance depends on two important factors: overcoming a verticalized education and dealing with the challenge of working in a field predominantly based on fragmented conduct. It is necessary to overcome the hierarchy of knowledge and value alterity, aesthetics, popular knowledge, transdisciplinarity, and dialogue.

In this respect, nursing education is supported by the current educational model, which does not take into account the view of humans as integrated beings. In other words, fragmented nursing education has been offered, reproducing fragmented knowledge, thus disregarding the elements that make up their network of relationships to which individuals belong.[14] Similarly, because nurses can work in technical nursing education, nurse technicians also acquire fragmented knowledge.

Given the aforementioned, the Resolution No. 6 of December 20th, 2012, which regulated technical and vocational education at the high school level, established that "educational systems should develop methodological guidelines for evaluation and validation of professional knowledge, which is developed by students throughout their professional and life trajectories".[4:10] Therefore, transformation is possible since paradigmatic changes can be obtained, which considers the students' relationships and integration of their knowledge.

In the meantime, the training of nurse technicians must be based on an emancipatory, participative, dialogical, creative education so that future professionals can have autonomy.[12] The *Base Nacional Comum Curricular* (BNCC) [Brazilian Common Core Curriculum], without compromising diversified education, states that education is a continuous emancipatory process, recognizing the importance of the educator's specific work and viewing praxis as a manifestation resulting from the association between theoretical and empirical knowledge.[21]

So, technical nursing education is approached from the perspective of the ecosystemic paradigm considering its contextual nature. In other words, this study took into consideration all the elements that compose reality, considering the relationships and nonlinearity between the elements that integrate the system.[13]

The study findings pointed out that technical nursing education should be based on the ecosystemic paradigm, in other words, it should consider the relationships and inter-relationships between all its elements.[13-14] As a result, nurse technicians can be trained to understand each individual according to space/time factors. Consequently, these individuals can reflect on professional practices based on the assumptions of the training received. They can overcome old paradigms and reflect on their professional performance beyond the role of task performers. Conclusively, as professionals, citizens, and social and historical beings, they can reflect on the importance of their actions.

CONCLUSIONS

Bearing the aforesaid in mind, stimulating research on technical nursing education is necessary considering the low number of publications addressing this topic.

It is understood that the training of nurse technicians is conditioned to multiple factors involving the network of relationships that make up the training and professional performance ecosystem. Thus, there is an emerging need to rethink old paradigms and insert new conceptual perspectives that support the training of these professionals.

The principles of the ecosystem paradigm can help to understand people considering different contexts and interactions with the elements that make up the space in which they live, work, and develop. Hence, it contributes to the development of a more contextual, effective, humanist technical nursing training education capable of bringing about real practical transformations.

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