



Infections related to health care in nurses' education

Infecções relacionadas à assistência à saúde na formação do enfermeiro

Infecciones relacionadas con la atención a la salud en la formación de las enfermeras

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Objective: to analyze the introduction of the theme infections associated to health care in nurses' education. **Methods:** this is a qualitative study, with documentary analysis of 16 interdisciplinary modules of a nursing integrated curriculum from a State University in Paraná, conducted in 2013. **Results:** in the first year of the course there were no references to infections. From the second to the fourth years there were 44 entries that approached: hand washing, actions to prevent infections in newborns, children, adults, pregnant women and surgical patients in different health environments, biosecurity, Regulatory Standard n. 32, dental-medical-hospital supplies processing, among others. One highlighted strengths and flaws on the approach of this theme in many moments of an integrated curriculum. **Conclusion:** the infections associated to health care, given their relevance and complexity, should be introduced in a transversal and continuous way in nurse's education, providing nursing students with a reflexive and critical learning.

Descriptors: Infection; Curriculum; Education, Nursing.

Objetivo: analisar a inserção do tema infecções relacionadas à assistência à saúde na formação do enfermeiro. **Método:** pesquisa qualitativa, com análise documental de 16 módulos interdisciplinares de um currículo integrado de enfermagem de uma universidade estadual do Paraná, Brasil, realizada em 2013. **Resultados:** no primeiro ano do curso não foram identificadas menções relacionadas à infecção. Do segundo ao quarto ano foram localizadas 44 menções que abordavam: higienização das mãos, ações de prevenção de infecções em recém-nascidos, crianças, adultos, gestantes e pacientes cirúrgico em diferentes ambientes de saúde, biossegurança, Norma Regulamentadora 32, processamento de artigos odonto-médico-hospitalares, entre outras. Evidenciaram-se lacunas e potencialidades da abordagem do tema em vários momentos em um currículo integrado. **Conclusão:** as infecções relacionadas à assistência à saúde, frente à sua relevância e complexidade, deveriam ser abordadas de maneira transversal e contínua na formação do enfermeiro, potencializando uma aprendizagem reflexiva e crítica do aluno.

Descritores: Infecção; Currículo; Educação em Enfermagem.

Objetivo: el objetivo fue analizar la inserción del tema infecciones relacionadas con la atención a la salud en la formación del enfermero. **Método:** investigación cualitativa, con análisis documental de 16 módulos interdisciplinarios de un currículo integrado de una universidad estatal de enfermería del Paraná, Brasil, en 2013. **Resultados:** en el primer año del curso, no fueron identificadas citas sobre infección. Del segundo al cuarto año, se localizaron 44 entradas sobre higiene de las manos, acciones de prevención de infecciones en recién nacidos, niños, adultos, embarazadas y pacientes quirúrgicos en diferentes sectores de la salud, bioseguridad, Norma Reglamentaria 32, tratamiento de artículos dental-médico-hospitalario, entre otros. Evidenciaron lagunas y potencialidades del enfoque del tema en varias ocasiones en un currículo integrado. **Conclusión:** infecciones relacionadas con la atención a la salud, delante de su importancia y complejidad, deben abordarse de forma transversal y permanente en la formación del enfermero, para el aprendizaje reflexivo y crítico del estudiante.

Descritores: Infección; Curriculum; Educación en Enfermería.

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Introduction

Infections related to health care are considered a public health problem, making health systems to seek to develop effective measures for its prevention and control. These actions are also related to the change in behavior of professionals who work directly or indirectly with health care. Therefore, professional training is very important to work in the health area.

It is during the training process that future professionals can acquire knowledge, develop skills and, especially, consolidate a performance with competence in health care. Nursing undergraduate courses must prepare professionals to reflect in order to face and modify health or disease conditions, promoting the improvement in individuals', groups' and community's quality of life, contributing, by extension, with the transformation of reality⁽¹⁻⁴⁾.

Disorders resulting from infections of injuries related to care include significant mortality and morbidity, length of stay and, consequently, increased costs for services and risk for the spread of multiresistant bacteria⁽⁵⁾. It is also noteworthy the psychological impact that users suffer when they get infections related to care, because they usually look for services to meet certain welfare demands and not to create new diseases such as infections related to health care.

These infections are among the top five causes of death in the world⁽⁶⁾, together with cardiovascular diseases, cancer, respiratory diseases and infectious diseases. Mortality rates related to these diseases vary according to topography, underlying diseases, etiology, among others. According to a multicenter study conducted in Brazilian hospitals, there is a wide variation in the fatality rates due to hospital infection, from 9% to 58% reaching 40% among bloodstream infections⁽⁷⁾.

Concrete actions on the part of health services are justified both for minimizing the damage and suffering to patients, as well as for reducing the high costs associated with the treatment of infectious conditions. This control aims to reduce morbidity and

mortality associated with these causes, to meet legal and ethical requirements, and to enable improvements in the quality of care provided to users⁽⁸⁾.

From this perspective, it is important to highlight the role of nurses in the prevention and control of infections because they work in direct contact with patients, manipulate and control equipment, instruments and medications, and many of these professionals assume a prominent role in hospitals' infection control committees, and other areas in the health sector that deal specifically with this subject⁽⁹⁾.

Therefore, during undergraduate studies it is necessary a systematic approach to this issue with an interdisciplinary approach in an integrated way, since several subjects that are part of the curriculum in professional training courses teach diagnostic and therapeutic procedures that must follow rules and routines of infections prevention⁽¹⁾. It is the experience of interdisciplinarity that enables students to do the interrelationship of subjects, the contents of different areas, preserving the autonomy and the depth of specific knowledge, realizing that these academic disciplines interact dynamically, contributing to the attainment of a multidimensional understanding of the subject⁽¹⁰⁻¹¹⁾.

To examine how infections associated to health care are included in the curricula of the nursing area, one chose to study a reality that used an integrated curriculum, considering that this pedagogical project, for being based on the problematization methodology, with a critical-reflective conception of education and learning, would have greater potential to contemplate interdisciplinarity and the relationship between theory and practice^(10,12).

Thus, the question that guided the development of this study was: how is the theme of infections associated to health care discussed in the political pedagogical project of the integrated curriculum of an undergraduate nursing course? And it aimed to analyze the inclusion of the theme infections related to health care in nursing education.

Method

This is a qualitative, descriptive research, of documental type, having as its *corpus* an integrated curriculum of an undergraduate nursing course, in 2013.

An integrated curriculum is defined as one that organizes knowledge integrating the contents that have a connection with each other. One understands nursing education as a social practice that seeks to contribute to the development of the student as a whole⁽¹¹⁾. It enables the insertion of themes in a gradual, integral and continuous way over the four years of the student's education through interdisciplinarity. Knowledge construction occurs from the questioning of social and health reality by encouraging active student participation in the learning process, valuing their previous knowledge and establishing a relationship between theory and practice^(11,13).

The curriculum of this teaching proposal is established in interdisciplinary modules, and they should provide the development of cognitive, psychomotor and attitudinal skills, considered essential abilities for students to meet the proposed performances and skills⁽¹⁴⁾. The teaching plans used in the modules were called class plan notebooks and development of interdisciplinary modules⁽¹⁵⁾. These notebooks are structurally organized into teaching and learning units and they present the knowledge areas involved in that particular module⁽¹⁴⁾.

Having the class plan notebooks and development of interdisciplinary modules, one conducted the reading composed of four phases⁽¹⁶⁾. In the exploratory reading, the research documents were read in full and one established the relationship between the information contained in the documents with the question proposed. In the selective reading, one aimed to identify which class plan notebooks and development of interdisciplinary modules had references to infections related to health care. One decided to exclude two class plan notebooks and

development of interdisciplinary modules from the last year for dealing with general guidelines for the preparation of the course completion assignment, which would not enable the analysis of specific issues.

In the selection of documents one performed an analytical reading, which aimed to organize and summarize the information contained in the documents, looking for answers to the research question which corresponded to the last stage of this interpretive reading⁽¹⁶⁾. At this stage one attempted to relate the mentions about infections in health care with specific references about the subject under study.

This study was approved by the Ethics Committee for Research involving human beings of the State University of Londrina [*Universidade Estadual de Londrina*], under number 173/2011 according to the Presentation Certificate of Ethics Appreciation number 0162.0.268.000-11.

Results

The integrated curriculum under study is organized into four modules in the first and fourth years, and five in the second and third years, totaling 18 interdisciplinary modules. Out of these, one analyzed 16 class plan notebooks and development of interdisciplinary modules of the 2013 nursing undergraduate course.

The analysis of the 16 modules showed 44 mentions of the topic infections related to health care that are from the second to the fourth year of the course, being 15 addressed in the second year, 14 in the third and 15 in the fourth year of the course.

In the first year of the course the theme infections related to health care was not found in any of the notebooks of the four modules that compose the series. In the second year, three of the five modules had content about infections related to health care. The three modules addressed the following contents: hygiene and antisepsis of the hands, wearing gloves for hospital infection prevention and self-protection, disinfection of the patient's unit,

sterilization processes and quality control, microbial death mechanism, biosafety and issues concerning regulatory standard 32. The following definitions were dealt with: hospital infection; infection in health services; normal flora, resident and transient; asepsis; antisepsis; contamination; disinfection; cleaning; sterilization and chemical agents. They also presented specific issues such as catheter infection prevention and in aseptic wounds.

In the third year all the modules had some type of approach on the subject. They were related to the prevention and control of hospital infections focused on the health of newborns, children, adolescents, women and adults. When dealing with women's health, one highlights pregnant women's urinary complaints, postpartum complications, as well as mastitis as breastfeeding complications. Regarding surgical patients, one prioritized their evaluation and raised questions regarding risk factors for the development of infections, signs of infection and prevention measures, cleaning of the operating room, degermation and antisepsis of surgical site, main antiseptics used in the surgical field and biosafety. In relation to newborns, children and adolescents the contents were not highlighted, only placed in a generic way. There were no individual references applied to the health of the elderly.

In the fourth year only one module did not address the subject studied. The last year brought important issues related to critical patients, mechanisms of transmission of infectious agents, main agents found in intensive care unit patients, prevention of hospital-acquired pneumonia in patients on mechanical ventilation, care with tracheostomy cannulas, biosecurity, regulatory standard 32, process of disinfection of units and insulation/precautions standards in communicable diseases. They also addressed related and predisposing factors for the development of infections, prevention and control of nosocomial infections related to nursing care. Thus, out of the 16 modules analyzed, seven showed no content about the theme infections related to health care.

Out of the eight references found, six were books and two were manuals. Seven of the eight citations were mentioned in the references of the modules of the second year. In the third year of the nursing undergraduate course two authors were referenced and in the last year only one reference was cited for study. It is observed that the years of references were between 1992 and 2006.

Discussion

The results showed that although the issue of infections associated to health care is developed in several interdisciplinary modules, it is still not addressed continuously in the four-year nursing undergraduate courses.

One emphasizes the absence of the subject being studied in the first year of the undergraduate course, and on that year student already act in Basic Health Units, conduct home visits and develop activities in the laboratories of basic areas.

One of the principles of the integrated curriculum is interdisciplinarity, which addresses the interrelation and the dialogue between different areas of knowledge aiming at a multidimensional understanding of the phenomenon⁽¹¹⁾. It is believed that, due to the fact that infections related to health care are present in all healthcare environments, educational institutions should prepare students for their entry in the health services since the beginning of their learning activities in order to develop their critical awareness and skills. Such practices seek to involve aspects related to biosafety, basic notions of prevention and infection control, hand hygiene, cross-infection, asepsis and antisepsis. Students should have these first contacts before or during the beginning of the practical activities that will be developed.

From the second to the fourth year of the integrated curriculum, it was observed that the health care-related infections have been addressed in several interdisciplinary modules, ranging from hand hygiene to more specific questions. This constitutes

an advance for the teaching and learning of infections related to health care, once students have successive approximations to the topic in different contents.

Interdisciplinary modules are educational organizations that are characterized by interdisciplinary activities that seek to develop competence through interrelation of concepts and organization of activities, promoting meaningful learning with the use of active methodological strategies⁽¹⁴⁾. Meaningful learning is a process by which new information relates to relevant aspects of the students' prior knowledge⁽¹⁰⁾. The way in which the contents were displayed in the documents allows the inference that the subject of infections related to health care is being presented increasingly in scope and complexity.

Learning only becomes relevant when it enables transformation, and in the case of the health area, in particular, it is urgent and necessary that the object of transformation of care practice is the patient. The teaching and learning process should be consistent with the reality so that it can create opportunities of experiences that enhance the change of values, concepts and behaviors of the future professionals, who will work in several health areas⁽¹³⁾.

Knowledge cannot be done in a fragmented way, where the whole is not apprehended, because it is with the articulation of knowledge that one can understand the whole⁽¹⁷⁾. Then, in the context of infections associated with health care, one advocates the need for professors to reflect on the importance of teaching this subject over the years of nurses' education. In this educational scenario it is expected that the theme infections related to health care is taught with greater breadth and depth in the development and construction of knowledge.

Linking a part to the whole also allows students to understand the total, which goes beyond the observation of the context, besides the search in the connection of the parties the individual qualities of each one of them. The lack of the binding with the whole can compromise the reflection about the subject⁽¹⁷⁾.

In relation to the specific references on infections related to health care, it is observed that they are partially fulfilling its objective, because, as they are not current and complete in the class plan notebooks and in the development of the interdisciplinary modules, they do not help and support students' learning about the topic.

Between the years 2006 and 2013 the National Health Surveillance Agency developed several manuals that address national criteria of infections related to health care, guidelines for prevention of infections related to health care and patient safety in health services⁽¹⁸⁻²⁰⁾, and these references are still not incorporated in the class plan notebooks and in the development of the interdisciplinary modules. They are references that, if presented to the students, may contribute to their teaching and learning.

An integrated curriculum provides students with individual or group study time, in which students have as a starting point for this study the guidance of professors and the basic bibliographic references found at the end of each class plan notebook and development of interdisciplinary modules. These references, when they are not current, can harm the students to carry out the association between theory and practice, development of investigative clinical reasoning, as proposed by the integrated curriculum.

Review of references in the modules is indispensable, it is known that knowledge should not be reductionist or detached from reality, as the restriction from the complex to the simple would bring damage to education⁽²¹⁾.

One did not find specific mentions related to multidrug-resistant microorganisms, antibiotic use and control, microbial resistance mechanisms, prevention and control of infections of the urinary tract, bloodstream and intravascular catheters. It is known that these are some of the content covered with a lot of emphasis on manuals of the Ministry of Health⁽¹⁹⁻²⁰⁾ and guidelines from the Centers for Disease Control and Prevention⁽²²⁻²³⁾.

Another important theme not found in the class

plan notebooks and development deals with laws and ordinances that establish the commissions of hospital infection control. The Ministry of Health talks about the obligatoriness and maintenance of the hospital infection control program, in order to reduce to a minimum the incidence of this event and each hospital should establish a commission within the hospital, as an advisory body to the highest authority of the institution and implementation of hospital infection control. The hospital infection control committees are an obligation established in law and one of the executive members should preferably be a nurse⁽²⁴⁾.

It is known that such committees are composed of a multidisciplinary team, but in most cases, it works directly with professional nurses who work in various sectors of the hospitals. Therefore, it is essential that undergraduate students know and experience this service, enabling a better care quality and reducing the risk of patients developing infections. It is also believed that the basis of hospital infection prevention is the hospital infection control commission, which is able to develop an effective program that results in the safety of patients and health professionals and thus in the improvement of the quality of care⁽¹⁵⁾.

Education needs to be carried out with total vision, so that it does not stay in the inertia of the fragmentation of content divided by academic disciplines, understanding life in all its context of possibilities and limitations⁽²¹⁾. Thus, due to the complexity that the subject under study brings, its actions of prevention and control should compose the pedagogical political projects of the healthcare training institutions. And these should be worked in an integrated way, in which all subjects would be accountable for the principles, norms and assumptions related to the prevention and control of infections related to health care.

To achieve relevance in the studied subject, knowledge must seek complexity, considering that the content addressed is inseparable and constitutes a whole. This understanding refers to the principle of context, global and multidimensional, when one

should not separate parts from one another⁽¹⁷⁾.

Given the arguments that contextualize the relevance and complexity of infections related to health care, its possible personal, professional and social impacts, it is argued that this topic should be cross-sectional in the process of teaching and learning of health professionals. It is accepted as cross-sectional something that goes through academic disciplines and permeates all the years in a growing and connected way with the essential performances that students have to achieve. An important point is that they should be worked continuously and gradually, increasing the levels of complexity in which parts are related to a whole⁽¹⁰⁾. Thus, in line with the National Educational Bases and Guidelines Law and with the National Curricular Guidelines, it is argued that the issue of infections related to health care should be contemplated in all the years of nurses' education.

It is emphasized that the knowledge of the information in an isolated way is insufficient. It is necessary to relate the context in which students experience their learning of the information and of the study data in order to make sense. Knowledge must gather the objects in their context, in their complexity and in their totality, creating a link between the parts and the whole⁽²¹⁾.

Thus, academic disciplines or modules from nursing courses should include the teaching and learning of the bases about infections because any conduction of diagnostic or therapeutic procedures have the need for professionals to develop measures of prevention and control of infections.

The proposal of teaching of the integrated curriculum seeks the training of competent and critical-reflective professionals and of citizens who can act in society's process of transformation. This teaching method seeks to improve learning with a comprehensive educational proposal, instead of transmitting the content in only one academic discipline allocated at a given moment of the course. The results found embody and demonstrate the reality that, although it has gaps, it opens up possibilities

to develop an educational practice that addresses the issue in successive approximations, relating it to specific contents of each module, providing opportunities for reciprocal relations and influences between the parts and the whole in a complex world.

The advances that the proposed integrated curriculum has and pointing the gaps found in it contributes to its improvement. Therefore one reiterates the need to train professionals from the perspective of completeness, a goal pursued in health courses in recent years. These proposals tend to develop integrated teaching methods, based on an epidemiological profile, enjoying the active methodologies applied in collective spaces of organization and evaluation⁽¹¹⁾.

Conclusion

It can be considered that revealing how the subject is being developed, infections related to health care, in an integrated nursing curriculum, enabled one to identify an innovative way, which seeks to build, gradually and continuously, students' object of learning. This reality can contribute to attract the attention of nursing professors about the possibility of implementing this theme in a procedural way. Professors should reflect and engage with this issue, providing opportunities for the development of technical, scientific and humanistic skills, seeking to build the power of prevention and control of infections related to health care in the future health professionals.

We are aware that the approach of the subject in the training of health professionals is neither simple nor easy. It is hoped that this study can arouse the interest of professors of health educational institutions, in general, to look carefully for the development and discussion of the courses' pedagogical projects. It is suggested that this study is done in other courses of the health area, in order to have a diagnosis of how this issue is being addressed in other professions across the country.

Collaborations

Giroti SKO and Garanhani ML contributed to the project's planning, design, analysis, interpretation of results, revision and final version of the article for publication.

References

1. Pereira MS, Souza ACS, Tipple AFV, Prado MA. A infecção hospitalar e suas implicações para o cuidar da enfermagem. *Texto Contexto Enferm.* 2005; 14(2):250-7.
2. Azambuja EP, Pires DP, Vaz MRC. Prevenção e controle da infecção hospitalar: as interfaces com o processo de formação do trabalhador. *Texto Contexto Enferm.* 2004; 13(n.esp):79-86.
3. Nosow V, Puschel VAA. O ensino de conteúdos atitudinais na formação inicial do enfermeiro. *Rev Esc Enferm USP.* 2009; 43(n.esp 2):1232-7.
4. Tipple AFV, Mendonça KMM, Melo MC, Souza ACS, Pereira MS, Santos SLV. Higienização das mãos: o ensino e a prática entre graduandos na área da saúde. *Acta Sci Health Sci.* 2007; 29(2):107-14.
5. Agência Nacional de Vigilância Sanitária. Anvisa intensifica controle de infecção em serviços de saúde. *Rev Saúde Publica.* 2004; 38(3):475-8.
6. Tipple AFV, Souza ACS. Prevenção e controle de infecção: Como estamos? Quais avanços e desafios. *Rev Eletr Enf.* [periódico na Internet]. 2011 [citado 2014 dec 13];13(1):10-1. Disponível em: <http://www.fen.ufg.br/revista/v13/n1/v13n1a01.htm>
7. Marra AR, Camargo LFA, Pignatari ACC, Sukiennik T, Behar PRP, Medeiros EAS et al. Nosocomial bloodstream infections in brazilian hospitals: bnanlysis of 2,563 bases from a prospective nationwide surveillance study. *J Clin Microbiol.* 2011; 49(5):1866-71.
8. Agência Nacional de Vigilância Sanitária. Segurança do paciente: higienização das mãos. Brasília: Anvisa; 2008.
9. Batista MA, Moura MEB, Nunes BMVT, Silva AO. Representações sociais de enfermeiras sobre infecção: implicações para o cuidar prevencionista. *Rev Enferm UERJ.* 2012; 20(4):500-6.

10. Garanhani ML, Alves E, Nunes EFOA, Araújo LDS. Princípios norteadores do projeto pedagógico do currículo integrado do curso de enfermagem. In: Kikuchi EM, Guariente MHDM, organizadoras. O currículo integrado: a experiência do curso de enfermagem da Universidade Estadual de Londrina. Londrina: UEL; 2012. p. 59-74.
11. Garanhani ML, Vannuchi MTO, Pinto AC, Simões TR, Guariente MHDM. Integrated nursing curriculum in Brazil: a 13-year experience. *Creative Educ.* 2013; 4(12):66-74.
12. Garanhani ML, Valle ERM. Educação em enfermagem: análise existencial em um currículo integrado sob o olhar de Heidegger. Londrina: Eduel; 2010.
13. Oliveira MAC. A interdisciplinaridade no ensino e na pesquisa em Enfermagem. *Rev Esc Enferm USP.* 2012; 46(2):1-2.
14. Dessunti EM, Guariente MHDM, Kikuchi EM, Tacla MTGM, Carvalho WO, Nóbrega GMA. Conxetualização do Currículo Integrado de Enfermagem da Universidade Estadual de Londrina. In: Kikuchi EM, Guariente MHDM, organizadoras. O currículo integrado: A experiência do curso de enfermagem da Universidade Estadual de Londrina. Londrina: UEL; 2012. p. 17-33.
15. Giroti SKO, Garanhani ML, Guariente MLDM, Cruz EDA. Teaching of health care-related infections within an integrated Nursing Curriculum. *Creative Educ.* 2013; 4(12):83-8.
16. Gil AC. Como elaborar projetos de pesquisa. São Paulo: Atlas; 2010.
17. Morin E. Introdução ao pensamento complexo. Porto Alegre: Sulina; 2011.
18. Agência Nacional de Vigilância Sanitária. Medidas de prevenção de infecção relacionada à assistência à saúde. Brasília: Ministério da Saúde; 2013.
19. Agência Nacional de Vigilância Sanitária. Microbiologia clínica para o controle de infecção relacionada à assistência à saúde. Brasília: Ministério da Saúde; 2013.
20. Agência Nacional de Vigilância Sanitária. Segurança do paciente em serviços de saúde: limpeza e desinfecção de superfícies. Brasília: Ministério da Saúde; 2010.
21. Morin E, Almeida MC, Carvalho EA, organizadores. Educação e complexidade: os sete saberes e outros ensaios. São Paulo: Cortez; 2009.
22. Center for Disease Control and Prevention. Department of Health & Human Services USA. Guidelines for the prevention of intravascular catheter-related infections. Atlanta: HICPAC; 2011.
23. Siegel JD, Rhinehart E, Jackson M, Chiarello L. Guideline for isolation precautions: preventing transmission of infectious agents in healthcare settings. Atlanta: HICPAC; 2007.
24. Ministério da Saúde (BR). Portaria nº 2616/MS/GM, de 12 de maio de 1998. Dispõe sobre a obrigatoriedade da manutenção pelos hospitais do país, de programa de controle de infecções hospitalares. Brasília: Ministério da Saúde; 1998.