



### SYSTEMATIC REVIEW OF LITERATURE

#### NURSING IN COMPUTER INFORMATION SYSTEMS: A SYSTEMATIC REVIEW OF THE LITERATURE

A INFORMÁTICA EM ENFERMAGEM NOS SISTEMAS DE INFORMAÇÃO: REVISÃO SISTEMÁTICA DE LITERATURA

LA INFORMATICA EN ENFERMERÍA EN LOS SISTEMAS DE INFORMACIÓN: UNA REVISIÓN SISTEMÁTICA DE LA LITERATURA

Dayane França Braz Lima<sup>1</sup>, Gesiane Pires Ivo<sup>2</sup>, André Luiz Souza Braga<sup>3</sup>

#### ABSTRACT

**Objective:** to identify scientific productions on information systems, preferably the electronic medical record and its relationship with nursing. **Methodology:** This is a bibliographic computerized, with systematic analysis in databases BDNF, LILACS and SciELO, where 10 articles were selected and highlighted its main ideas. We performed a critical analysis and discussion of results. **Results:** The results showed that the computer favors takes of decision and allow a better use of assistance, but there is a greater need for technologies for systematization of nursing. **Conclusion:** There is need for the involvement of nursing in the production of health technologies, so that we have a computerized system for nursing and there is incentive graduation. In scientific basis there are few publications concerning the electronic medical record in nursing. **Descriptors:** Information System, Nursing Informatics.

#### RESUMO

**Objetivo:** Identificar produções científicas sobre sistema de informação, preferencialmente o prontuário eletrônico e suas relação com a enfermagem. **Metodologia:** Trata-se de um levantamento bibliográfico computadorizado, com análise sistemática, nas bases de dados BDNF, LILACS e Scielo, onde foram selecionados 10 artigos e destacadas suas idéias principais. Foram realizadas análise crítica e discussão dos resultados encontrados. **Resultados:** Os resultados evidenciaram que a informática favorece as tomadas de decisão e possibilitam um maior aproveitamento da assistência, mas há uma maior necessidade de tecnologias voltadas para sistematização da enfermagem. **Conclusão:** Há necessidade da participação da enfermagem na produção das tecnologias em saúde, para que tenhamos um sistema informatizado para enfermagem e que haja incentivo na graduação. Nas bases científicas existem poucas publicações referentes o prontuário eletrônico na enfermagem. **Descritores:** Sistema de informação, Enfermagem, Informática.

#### RESUMEN

**Objetivo:** Identificar las producciones científicas sobre sistemas de información, preferiblemente la historia clínica electrónica y su relación con la enfermería. **Metodología:** Se trata de un sistema informatizado bibliográfica, el análisis sistemático de las bases de datos BDNF, LILACS y SciELO, donde se seleccionaron 10 artículos y destacó sus principales ideas. Se realizó un análisis crítico y discusión de los resultados. **Resultados:** Los resultados mostraron que el equipo favorece la decisión tomas y permitir un mejor uso de la asistencia, pero hay una mayor necesidad de tecnologías para la sistematización de la enfermería. **Conclusión:** Existe la necesidad de la participación de la enfermería en la producción de tecnologías de la salud, por lo que contamos con un sistema computarizado para la enfermería y no hay graduación de incentivos. En base científica existen pocas publicaciones acerca de la historia clínica electrónica en la enfermería. **Descriptor:** Sistema de Información, Informática de enfermería.

<sup>1</sup>Academic nursing nursing school in aurora afonso costa / uff. e-mail: dayanebraz@hotmail.com. <sup>2</sup>Academic nursing nursing school in aurora afonso costa / uff. e-mail: gesianenf@gmail.com. <sup>3</sup>Master. professor, department of fundamentals of nursing administration and nursing school in aurora afonso costa / uff. e-mail: andre.braga@globo.com.

## INTRODUCTION

Information is a key element in the decision making and execution quality, so the better the information, effective the quality of work. The Health Information System (SIS) aims analysis and transmission of information needed to plan and evaluate health services, enabling government agencies to adopt agile, measures of disease control, prevention and health promotion, offering indicators of effectiveness and health services.

In Brazil, the National Policy on Information and Health Informatics, came in 2003 after the 12th National Health Conference, this led to the implementation of policies articulated information communication, continuing education and popular health, ie, an exchange of information effectively ensuring SUS guidelines.<sup>1</sup>

Currently the health information is computerized, using information technology, which is a collection of hardware, software and Internet, performing the tasks of information processing, such as the collection, storage, retrieval and manipulation.

The health technologies enable the organization of the daily records, causing consultations and reports on information produced, which will highlight the electronic medical record.

The patient's medical record is an essential element to health care, requiring contain important information, ensuring continuity of patient care. This is designed to ensure that health teams to systematically recall the events of each clinical patient, so in a health institution, the chart is the primary vehicle for informing the patient.

However, the activities of care often do not occur in the same institution, not allowing full assistance to the patient.

The electronic health record (EHR) is an electronic registration document, which aims to use the team's collective health, because it can be available in several places at once. In addition to enabling the storage of all information health, administrative and clinical patient's full of life. The PEP has some important advantages of manual records, such as access simultaneously in different places, but security because it allows the implementation of backup, if there is loss of information, readable, because the record is so typed enables greater understanding.

It is noteworthy that 50% of the records in the patient's nursing staff that realizes<sup>8</sup>, evaluates and implements this quality of care records and any information regarding nursing care. Therefore, it is an inherent factor that health technologies have an active nursing.

Therefore, this study aims to identify scientific productions on information systems, preferably electronic medical records and their relationships with nursing. Given the importance of the theme on the computer and its technologies and its strong relationship with nursing. The construction of a literature review on the same point that the implications in information systems and nursing service, bring a considerable contribution to the nurses in their activities and thus contribute to improving the quality of nursing care to patients.

## METHODOLOGY

The research is an exploratory, since the exploratory consist of empirical research aimed at formulating questions or a problem with triple aim: develop hypotheses, increase familiarity with the environment of the researched, fact or phenomenon to perform a Future research needs to further modify and classify concepts.<sup>3</sup>

The methodological approach is

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qualitative, this type of research arises because of the impossibility to investigate and understand, through statistical data, some phenomena focused on perception, intuition and subjectivity. Be directed to research the meanings of human relationships in which their actions are influenced by emotions and / or feelings touched on the situations experienced in day-to-day.<sup>4</sup>

The methodology consisted of a computerized literature search, with systematic analysis, conducted in the period May-June 2010, using the keywords: nursing information system and electronic medical record, having been made all possible crosses between the descriptors. Went up the Virtual Health Library (VHL) available at [www.bireme.br](http://www.bireme.br) in which were accessed the databases SciELO, and LILACS BDEF.

The following steps were: defining the criteria for sample selection, criteria for inclusion and exclusion of articles, defining the information to be extracted from each article; analysis of the results of the content of the articles, and highlight the items that make the association with nursing the electronic patient record. The criteria for selection of articles were full-text articles, with time frame from 2000 to 2010, written in Portuguese or English; treat the electronic patient record system or similar information that is related to nursing or relevant aspect in the research.

After reading the publications, were highlighted its main ideas, presented in Table 2. We performed a critical analysis and discussion of the results found in each text, allowing the preparation of the considerations on the subject.

## RESULTS AND DISCUSSION OF DATA

When conducting the survey, we found that the keywords with information system and electronic medical record in the database BDEF

not found any publication, LILACS released 17 publications, the SCIELO no.

Already with the intersection of keywords and nursing information system, we find the bases of BDEF 55 articles, 94 articles in LILACS and SciELO 50 articles.

In the last crossing of words, nursing and electronic medical records, identified in databases of BDEF 2 posts in 4 articles LILACS was available and only 1 SCIELO publication.

Among the articles found, publications realized we had in common in databases, so after refining, as bibliography potential, 10 papers were selected for analysis, according to the inclusion criteria and were more directly related to the topic.

The table below presents the number of articles concerning the intersections of keywords:

**Table 1** - number of articles concerning the intersections of the keywords in the databases. Niterói, 2010.

Sistema de Informação e Prontuário Eletrônico		Sistema de Informação e Enfermagem		Enfermagem e Prontuário Eletrônico	
BDEF	0 artigos	BDEF	55 artigos	BDEF	2 artigos
LILACS	17 artigos	LILACS	94 artigos	LILACS	4 artigos
SCIELO	0 artigos	SCIELO	50 artigos	SCIELO	1 artigo
Total de artigos					223

Table 2 below corresponds to the authors, titles and objectives of selected publications, which served as the basis for deliberations and drafting of this article.

**Table 2** - Publications located, according to the topic in the database. Niterói, 2009.

	Authors, Country and Date	Title of the article	Object of the research
1°	Paulino Artur Ferreira de Sousa; Marta Hansen Lima Basto Correia Frade; Denisa Maria de Melo Vasques de Mendonça. Brazil, 2005.	A model of organization and information sharing between hospital nursing and health center: delphi study	Present the development and definition of a new organization and sharing of information between hospital and nursing Health Center
2°	Ofélia Eliana L. Rodríguez; Maria Elena E. Guanilo; Luciana Magnani Hernandez; Guedes Candundo. Brazil, 2008.	Nursing informatics: facilitating communication and support for practice	The aim of this study was to analyze the introduction and use of information technology in everyday nursing. A lot of hospitals are already making use of modern portable systems, which allows access to information anytime anywhere.
3°	Heimar de Fátima Marin; Isabel Cristina Kowal Olm Cunha. Brazil, 2006.	Current Perspectives in Nursing Informatics	Present the current landscape of computing resources in nursing and its advantages for the same.
4°	Sérgio Ribeiro dos Santos, Brazil, 2005.	Nursing information system: interaction of tacit-explicit	This paper aims to outline some theoretical and conceptual considerations on the nursing information system, seeking to situate the knowledge based on clinical evidence to build a model of integrated conceptual structures, formed by the combination of three sciences: information, computation and nursing.
5°	Sérgio Ribeiro dos Santos; Maria Miriam Lima da Nóbrega. Brazil, 2004.	The search for interaction theory and practice in nursing information system - focus on grounded theory	Understand, through discourse of nurses, the theory-practice relationship in nursing and its implications for the development of information systems.
6°	Sérgio Ribeiro dos Santos; Adenylza Flávia Alves de Paula; Josilene Pereira Lima. Brazil, 2003.	The nurses and their perception about the manual recording system in the medical record.	The aim of this study was to identify factors related to the understanding that nurses have the front manual system of recording information in nursing.
7°	Márcia Regina Cubas. Brazil, 2009.	Instruments of technological innovation and policy work in health and nursing - the experience of ICNP ® / CIPEsc®	Presents a reflection on the ICNP ® and CIPEsc ® construed as a technological breakthrough capable of supporting nursing knowledge.
8°	Ana Cristina Rossetti; Lucio Mauro Carqui. Brazil, 2009.	Implementation of computerized system for planning, management and optimization of scales nursing	Report the development and implementation of a computerized system to assist in planning, management and optimization of the scales in nursing units of the Albert Einstein Hospital.
9°	Daniela Couto Carvalho Barra, Grace Teresinha Marcon Dal Sasso. Brazil, 2010.	Mobile technology at the bedside: computerized nursing process in intensive care from 1.0 cipe ®	Ends to approach the customer care nurse in intensive care and contribute to its security, control and management of nursing practice from the use of a computerized technology.
10°	Cláudia Maria Barboza Machado Fonseca, Mônica Loureiro dos Santos. Brazil, 2007.	Information technology and hospital care: reflections on the meaning of work	The objective of this paper is to discuss the experience of nurses from the introduction of computerization in hospital work processes.

The following are the main ideas found in the selected articles. Data were analyzed and interpreted critically in order to determine their relevance to the theme proposed in this paper.

In the first study, the authors show that the consensus achieved to achieve a hierarchical aspects of the problem under study, namely the assumptions that should guide the development of the system and the information to be effectively shared between hospital and health center with indicating priority levels of access. They argue that the relationship between the various contexts of health care should be provided by a model that ensures reciprocal and confidential information of nursing, in real time, using the Information and Communication Technologies.<sup>5</sup>

What we note is that without an efficient information system, the difficulties of access to information necessary for realization of care, is greatly impaired. What also happens is that the information is not always shared. An information system that uses computer technologies and their favors, and much, decision making and enable better use of nursing service, which is reflected in direct patient care.

The second study reports that nurses are using computers for administrative tasks in direct patient care, teaching and research. Considers that health professionals and society in general should consider using the computer as a medium that facilitates the communication process and contributes to the efficient implementation of assistance. Moreover, they reinforce Despite that there is much discussion about the possibility of dehumanization of care from the use of this feature, we must remember that this is just a tool that assists the nurse and not a substitute for this.<sup>6</sup>

In this study be clear that nursing informatics, especially in information systems, have several benefits. Among these are: the control of quality of care, recovery and R. pesq.: cuid. fundam. online 2013. jul./set. 5(3):18-26

comparison of large amounts of information, the classification of patients, distribution of services, word processing, document distribution, communication between different sectors, the production of manuals; evaluation of personnel and administration of drugs, supplies and equipment. It is important to note that computer use does not interfere, or at least should not, said humanized.

O care informatics resource is aimed at supporting the service and not replace it, so it should help nurses achieve more time for direct care with all the information necessary for planning and implementing appropriate patient.

The third paper reports and illustrates how these are impacting computer resources and opportunities for teaching, research and specially for the nursing care of clients / patients, yet alert to the importance of humanized care in a setting of high technology. Features such as speech recognition, knowledge banks, genome project and even the Internet, have offered to Nursing a range of possibilities for improving professional performance and improved customer / patient.

As in the second text, the third depicts the advantages of nursing informatics. We should remember, very clearly, that the resources are computerized to ensure quality of service for both the professional and for the care provided to patients. Nurses should have a proper working condition and thus be more available to patient care, with the aid of machines, understand that their assistance is humanized.

The fourth publication highlights that knowledge can systematically describe and explain the phenomena needed to develop a comprehensive information system that contributes to the improvement of nursing records and consolidate mechanisms to provide basic measures of cost, quality, access and patient care result of this care. The authors advocate the idea of developing a nursing information system, which

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must be inserted in the organizational environment in order to facilitate the registration nursing and streamline the work process by integrating a vocabulary, and language universally accepted classification. These strategies are necessary because the information technology requires uniformity, accuracy, and data on patient care, allowing analyzes that provide improved quality of care.

In the fifth study, the authors suggest that the presentation of the results of this study begins with an understanding of the experiences of nurses, from the identification of two phenomena: the attempt to articulate the formal models in nursing practice, to develop information systems and vision of the gap between theory and practice in nursing information system. In the process of analysis and integration, found that nurses seek, by practical experience, to bridge the gap between theory and practice, causing them to have aspirations for the future professional. The process shows that despite the organizational and functional limitations, nurses want an information system that reflects the reality of clinical practice (tacit knowledge), but it may contain elements of formal knowledge (explicit), adapting them to a system Automated covering the nursing process in its entirety.

In the fourth and fifth text dealing with the same issue and we have the idea that theory and practice should always be together. In developing a system information can not be different. System models developed only by theoretical concepts have pointed to a feature most often little resolute. It is necessary that the development of an information system for the practical concept is valued, because he is the one who will dictate the functionality of it. And this is one of the reasons why nurses should be part of this development, because that way, it will be adapted to the real needs of users. For this it is also important that there is a uniformity of information, ie a R. pesq.: cuid. fundam. online 2013. jul./set. 5(3):18-26

standardized nursing language, so they can be better and worked to make the system work.

The sixth publication shows that nurses are dissatisfied with the system of manual registration and point to the need for changes in the current model record. It can be seen that records analyzed did not reflect the work of professionals, the care received by the client and their answers. In this sense, it is essential that nursing make greater investments in intention to resolve / minimize the problems identified in the notes, considering its importance in improving the quality of the registration of nursing actions.

It is worth mentioning here, that nurses already understand the need for new technologies to nursing. About registration model paper manual, it is clear the limitation that it imposes for nursing practice: are incomplete, inconsistent, often illegible, etc.. Thus, causes damage to the service and the patient often does not receive adequate assistance. It is in this context that the idea has been working electronic patient record.

In the seventh article, the authors for the mere introduction of computer technology in nursing classification systems is no guarantee for effective interoperability between these systems, however, is necessary for us to have an information system consistent with the present reality of the same. The CIPESC ® (Classification for Nursing Practice in Community Health), to meet the objective of forming into an information system capable of representing the practices of Collective Health Nursing that allows the classification of the terms, exchange of experiences and interchange of information at the national and international levels should strengthen the presence of phenomena from the practice of Nursing in Public Health at SUS.

The possibility of having nursing classification systems in computerized form is undoubtedly a major advance in the field of

nursing, and is an important component to support action planning and assistance. However in order to have an effectiveness that must be articulated classification system to other information systems so that there is an exchange of experiences and of course information.

The eighth study showed that the information system was deployed initially in nursing with online viewing of the scales of the units and their demands from patients. This system facilitates and allows the development and management scales monthly work, reducing the time used in making and ensuring information security and flexibility in obtaining data. After this deployment is possible to observe gains and opportunities for improvement both in the system as the process of planning and management of nursing scales.

This study addresses one of the possible benefits of deployment of informatics in nursing, proving to be a valuable managerial support. Its use in nursing scales favors the organization, visualization and easy preparation. Nursing, as a profession surrounded assignments, need supports that will optimize your time. The computer allows this saving of time in various activities of the nurse.

The ninth article shows that the system has Ergonomics and Usability criteria according to the International Organization for Standards systems. Above all, the system has developed practical application because it allows us to assess, intervene and manage nursing care providing greater security, knowledge and involvement of nurses with patient needs at the bedside. From this study, it is possible to say that the EP on PDA type device from the ICNP ® 1.0 can be considered a source of information and knowledge that nurses will provide new ways to learn critical care nursing, since it is a permanent reflections that also encourages research, dialogue among R. pesq.: cuid. fundam. online 2013. jul./set. 5(3):18-26

peers and interdisciplinary team, decision making, and especially the improvement of safety of nursing practice in the ICU.

This article, as well as the eighth presents the use of computers in a specific system and brings the demonstration of its benefits for nursing. Being the Intensive Care Unit of a sector complex and surrounded by plenty of information and specific care using this technology favors the nursing process, enhances the development of critical thinking and nursing, promotes dialogue between the team besides ensuring greater safety for the patient .

In the latter publication the authors noted that there was some resistance to change among the nurses and difficulties in organizing the work and introducing them to new ways of doing work. Facing the machine, they feel trapped and isolated. They concluded that interferes significantly in the computerization process of nursing work, especially considering their deployment conditions in the hospital under study, and can compromise their health in the future.

In spite of the computer always be an issue and current general knowledge, it is noted that some nurses are still reluctant to use this resource in your practice. The fact that nursing schools do not encourage the undergraduates in this field has proved to be a factor in this resistance. A fact of great importance also is that nurses often are not part of the development of computerized resources, and access to them when it is being implemented. So many times you want, understand why the use of the resource.

## CONCLUSION

We find the scientific basis of BDEF, LILACS and SciELO 10 articles that discuss about technologies in information, electronic medical record and relationship with nursing. We realize that an inefficient affect the information and

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assistance that promote health technologies in decision making thus allowing a better quality of care.

But it is important to highlight some drawbacks presented by some authors that identify the technology in nursing as lack of humanization in game against some authors argue that health technologies facilitate and streamline the work process, provide more and better health surveillance and nurses have a higher utilization of health care.

However some nurses complain about the lack of a computerized system that is facing systematization of nursing care, since this system was implemented in the extension of nursing management, for example in the production of scales.

We understand that the electronic health record technology is a means to systematize assistance, but despite the computer being a current topic of global knowledge, some nurses do not accept, and there is little incentive in nursing schools.

We conclude that there is need for the involvement of nursing in the production of health technologies, so that we have a computerized system for nursing and there is incentive graduation. In scientific basis there are few publications concerning the electronic medical record in nursing.

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