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Review Article

TECNOLOGIAS APLICADAS À SEGURANÇA DO PACIENTE: UMA REVISÃO BIBLIOMÉTRICA

TECHNOLOGIES APPLIED TO PATIENT SAFETY: A BIBLIOMETRIC REVIEW

TECNOLOGÍAS APLICADAS A LA SEGURIDAD DEL PACIENTE: UNA REVISIÓN BIBLIOMÉTRICA

Andréa Tayse de Lima Gomes[1], Yole Matias Silveira de Assis[1], Larissa de Lima Ferreira[2], Manacés dos Santos Bezerril[3], Flávia Barreto Tavares Chiavone[4], Viviane Euzébia Pereira Santos[5].

RESUMO

Objetivos: sumarizar as tecnologias voltadas para a segurança do paciente e utilizadas na assistência de enfermagem. **Métodos**: revisão bibliométrica da literatura cuja busca dos estudos se deu nas bases de dados PubMed, Cumulative Index to Nursing and Allied Health Literature, Scopus, Web of Science e Science Direct. Obteve-se uma amostra de 12 artigos com análise dos dados por estatística descritiva. **Resultados**: todos os artigos são do tipo descritivo (nível de evidência 4) e 91,7% possuem abordagem qualitativa (n=11); também foi encontrado o predomínio do uso de tecnologias leve-duras, com enfoque na importância da educação em saúde e aprimoramento de conhecimentos e habilidades. **Conclusão**: o uso e articulação entre as tecnologias leve, leve-dura e dura nos serviços de saúde tem grande contribuição para a segurança do cuidado.
Descritores: Desenvolvimento tecnológico; Segurança do paciente; Enfermagem.

ABSTRACT

Objectives: to summarize the technologies for the safety of the patient, which are used in nursing care. **Methods**: bibliometric literature review, whose study search happened on the databases PubMed, Cumulative Index to Nursing and Allied Health Literature, Scopus, Web of Science and Science Direct. It was obtained a sample of 12 articles with data analysis by descriptive statistics. **Results**: All items are descriptive (evidence level 4), and 91.7% has a qualitative approach (n = 11); It was also found the prevalence of the use of soft-hard technologies, focusing on the importance of health education and improvement of knowledge and skills. **Conclusion**: the use and articulation of light, light-hard and hard technologies on health services has great contribution to the safety of care.
Descriptors: Technological Development; Patient Safety; Nursing.

RESUMEN

Objetivos: Resumir las tecnologías para la seguridad del paciente y se utiliza en los cuidados de enfermería. **Métodos**: revisión de la literatura bibliométrica, cuya búsqueda de los estudios indicados en las bases de datos PubMed, Cumulative Index to Nursing and Allied Health Literature, Scopus, Web of Science y Science Direct. Obtuvo una muestra de 12 artículos con el análisis de datos mediante estadística descriptiva. **Resultados**: Todos los artículos son descriptivos (nivel de evidencia 4), y el 91,7% tiene un enfoque cualitativo (n = 11); También se encontró que la prevalencia del uso de tecnologías blandas-duro, centrándose en la importancia de la educación para la salud y la mejora de los conocimientos y habilidades. **Conclusión**: el uso de las tecnologías y la articulación de luz, la luz dura y difícil en los servicios de salud tiene una gran contribución a la seguridad de la atención.
Descriptores: Desarrollo Tecnológico; Seguridade del Paciente; Enfermería.

[1]Graduada em Enfermagem. Mestra em Enfermagem pelo Programa de Pós-graduação em Enfermagem da Universidade Federal do Rio Grande do Norte. [2]Graduada em Enfermagem pela Universidade Federal do Rio Grande do Norte. [3]Graduado em Enfermagem. Mestrando em Enfermagem pelo Programa de Pós-graduação em Enfermagem da Universidade Federal do Rio Grande do Norte. [4]Graduada em Enfermagem. Mestranda em Enfermagem pelo Programa de Pós-graduação em Enfermagem da Universidade Federal do Rio Grande do Norte. [5]Graduada em Enfermagem. Doutora em Enfermagem. Docente da Universidade Federal do Rio Grande do Norte.

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INTRODUCTION

Health technologies consist of products that contribute to the improvement of patient care, such as hospital equipment, health supplies, vaccines, medicines, diagnostic tests, prostheses and information systems[1-2].

Therefore, the incorporation and sustainability of these technologies in health services are operationalized according to the social and economic model of a given society, so that there is investment in technologies that are highly efficient and secure, with the promotion of benefits that surpass the damages, favoring the care provided to all who need them[1].

In Brazil, in 2011, the National Policy on Health Technology Management was instituted, whose purpose is to guide professionals in the area in the evaluation, incorporation, diffusion and removal of technologies in the services, in order to ensure the use of those most appropriate[3].

This was evidenced by a study carried out in Canada, which states that the implementation of technologies is a measure to improve the quality of health services in order to reduce damages to the patient and to promote safety in the care provided, with improvement in the performance of professionals who work in health institutions[4].

In a documentary research, authors[5] demonstrate that most of the technological productions recorded in the health area are focused on the practice of care. About these ones, they are highlighted the inventions related to hygiene and asepsis (36% of studies analyzed) and medication administration (28% of studies). This fact was justified by the search to optimize the time of care, with effectiveness in the accomplishment of procedures and control of the diseases.

In this context, the same areas of care evidenced previously are part of the measures of the national plan for patient safety in health services (PNSP), proposed by the Resolution of the Collegiate Board of Directors (RDC) nº 36 (July 25, 2013), which defines a diversity of actions for risk management and quality improvement, strengthening the idea of patient safety in institutions[6].

Among the health professionals involved in this context, the role of nursing in the participation of the technology deployment process when using these resources in their care practice stands out.

Therefore, it is fundamental that the nursing team is able to manage the use of these technologies, in order to reinforce the quality of care, with support in the delivery of care in a complex clinical environment. This fact demonstrates one of the implications related to the adhesion of the technologies in the practice of care, which consequently favors the construction of a service of high reliability, with reduction of adverse events and greater propensity to patient safety[7].

The range of benefits provided by the technologies in the advances of the health sector, with agility in processes such as diagnosis and quality in the treatment of diseases, is well known. However, it cannot be denied that the same artifacts present several harms in their applicability, in order to affect the safety of care[8].

Technological incorporation may lead to depersonalization of the patient, with reduced interactions with the team during the care provided. In addition, there may be disadvantages, such as unanticipated adverse events caused by drug therapy, ethical problems, the need for constant training to make professionals capable of handling, and a strong financial investment[7-8].

One way to keep the balance between these advantages and disadvantages is to keep the patient at the center of care. From this, it is possible to manage adequately the use of technologies in several common tasks in the practical routine, such as vital signs, medication administration and clinical evaluation[7].

In this context, it is clear the need to verify what the literature presents about what technologies are used in patient care and how this implantation takes place to encourage the practice of safe and resolutive care, with reduction of the occurrence of adverse events.

Nowadays, we can see how broad the discussion about the use of technologies aimed at patient safety has become, as well as the considerable importance of nursing in the construction of knowledge directed to this subject in order to promote a quality care.

The present study, therefore, was guided by the following question: What are the technologies used in nursing care aimed at patient safety? Therefore, the objective of this article is to summarize the technologies focused on patient safety and used in nursing care.

METHODS

This is a bibliometric review, which concerns a type of study with a certain methodological rigor, designed to answer a specific research question through the collection, selection and critical analysis of published studies[9].

Thus, this research was constructed from a protocol previously elaborated and validated, composed of the following topics: 1) definition of the guiding question; 2) search strategy in databases; 3) selection of studies, based on eligibility criteria; 4) analysis of the results found; 5) discussion and presentation of results.

For the execution of this study, the following steps were performed: definition of the research protocol; data analysis; and synthesis. These phases are decomposed into such activities: Search strategy; Search in databases; Organization of bibliographies; Standardization of selected articles; Composition of the article portfolio; Consolidation of data; and Synthesis and reporting[10].

The electronic search was done in the National Library of Medicine (PubMed Central), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Scopus Info Site (SCOPUS), Web of Science and Science Direct.

Data collection was performed using the descriptors indexed in the Medical Subject Heading Terms (MeSH): Technological Development (# 1), Patient Safety (# 2) and Nursing (# 3), and their synonyms.

The data collection happened in December 2015 and the crossings between the descriptors happened through the Boolean operator 'AND', and the electronic search on databases happened in an uncontrolled way. In addition, the feature "" was applied to restrict the search only to terms that were contiguous in the studies found. Thus, the crosses (MeSH), that is, the search strategies applied in the electronic databases were: 1# AND 2# AND 3#, 2# AND 3# and 1# AND 3#.

Regarding the eligibility criteria, the articles that deal with the use of nursing care technologies for patient safety, available in full, in the aforementioned databases, were included. In turn, we excluded the articles that did not correspond to the subject studied and/or did not respond to the guiding question; Studies that dealt with the use of technologies in nursing research, management and teaching; Articles of review, opinion, letters to the editor, theses and dissertations, and duplicate articles.

Initially, the studies were pre-selected based on the reading of the titles and abstracts. Subsequently, the full reading and selection of those who constituted the final sample of the research according to the eligibility criteria occurred.

Table 1 shows the selection process of the articles that constituted the total of studies found in each database, as well as the sample of those pre-selected for reading in full according to the search strategies used.

Table 1 - Distribution of the selected studies in the databases - Natal, Rio Grande do Norte (2016).

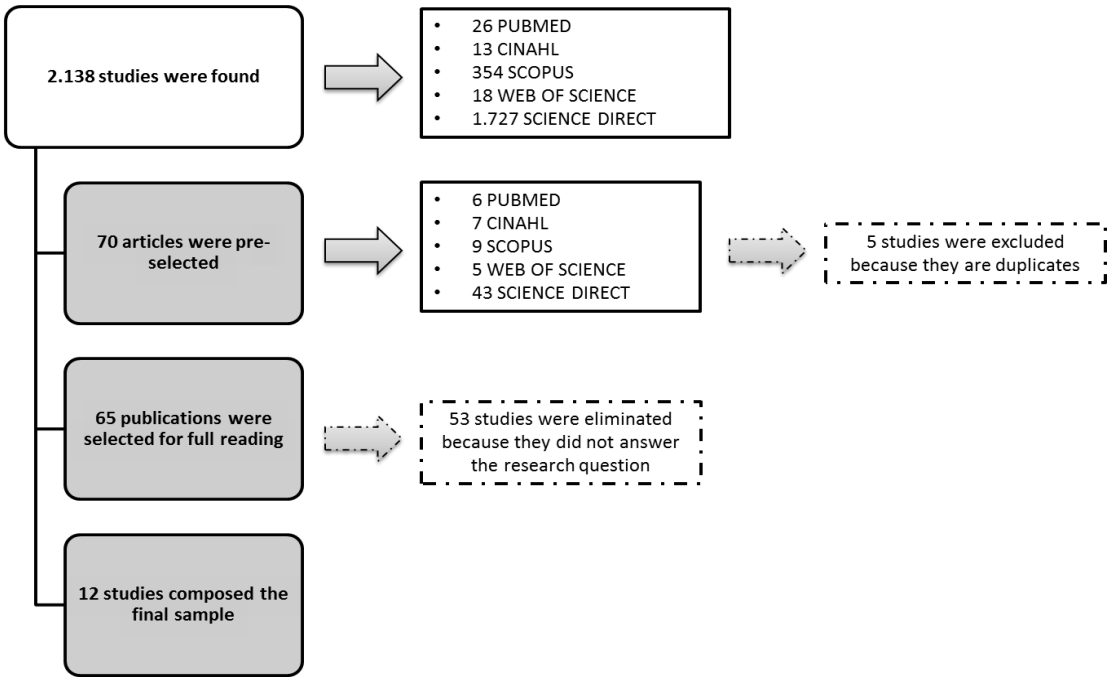
Database	Results of eletronical search						Pre-selected studies *	
	#1 AND #3		#1 AND #2		#1 AND #2 AND #3			
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**
PUBMED	25	1,4	1	0,4	0	0	6	8,6
CINAHL	13	0,7	0	0	0	0	7	10
SCOPUS	286	16,1	49	19,6	19	17,6	9	12,9
WEB OF SCIENCE	18	1	0	0	0	0	5	7,1
SCIENCE DIRECT	1.438	80,8	200	80,0	89	82,4	43	61,4
TOTAL	**1.780**	**100,0**	**250**	**100,0**	**108**	**100,0**	**70**	**100,0**

Source: own research.

* Pre-selected studies for reading the text in full according to eligibility criteria.

Figure 1 corresponds to the flowchart referring to the selection process of the articles that integrated the final sample of the present revision according to the selection steps already specified.

Figure 1 - Flowchart related to the article selection process – Natal, Rio Grande do Norte (2016).



Source: own research.

In order to facilitate the process of analysis and critical evaluation of the studies, an instrument was developed by the researchers and consisted of the following indicators: authors; Journal; Year of publication; objective; Type of study (bibliographic, descriptive, experimental and exploratory) and methodological approach (qualitative, quantitative or mixed)[11]; Level of evidence (1 to 5)[12] and degree of recommendation (A and B)[13]; Research participants; Technologies used in nursing care; Classification of technologies (light, light-hard and hard) [14]; Type of service (hospital, basic care, other); If hospital, what sector; Classification of the priority protocol of patient safety[6,15]; Measures applied for patient safety; Implications and recommendations for nursing.

Levels of evidence (1 to 5) ranged according to criteria proposed by Joanna Briggs Institute[12], which have the following stratification: Level 1 - Experimental studies (systematic reviews and randomized clinical trials); Level 2 - Quasi-experimental studies (systematic reviews of quasi-experimental studies, prospective controlled studies almost experimental and retrospective studies with controlled group); Level 3 - Analytical observational studies (systematic reviews involving cohort studies, cohort studies and case-control studies); Level 4 - Descriptive observational studies (systematic reviews of descriptive studies, sectional studies, case series and case study); and Level 5 - Expert opinions and research banks (systematic reviews of expert opinions, consensus of experts and banks of investigations or opinion of a single expert).

Regarding the degree of recommendation, the Joanna Briggs Institute[13] classifies in A and B, as follows: Degree of recommendation A - strong recommendation for a given health management strategy consists of: (1) it is evident that the desirable effects compensate undesirable effects; (2) when there is evidence of quality that supports the use of the object of study; (3) there is (are) no benefit (s) or no impact on the use of resources; and (4) the patient's values, preferences and experiences were taken into account; and Degree of recommendation B -

weak recommendation for a given health strategy is classified according to: (1) the desirable effects seem to outweigh the undesirable effects, although it is not explicitly stated; (2) presents evidence indicating the use of the resource (s), although it may be of poor quality; (3) there is a benefit without impact or with minimal impact to the detriment of the use of the resource (s); and (4) patients' values, preferences and experiences may or may not have been considered.

In addition, we classified the types of technologies involved in the health work process, which are divided into three different categories, namely: Light Technologies relate to relationships, bonding and reception; Light-hard technologies approach the structured knowledge in the work process (medical clinic, epidemiology, among others); and Hard Technologies consist of equipment and machines[14].

Finally, the critical analysis of the data happened after the floating reading of the selected articles. The data were entered in a spreadsheet in the Microsoft Excel 2010® program, analyzed by descriptive statistics and the final results were presented by Figures.

RESULTS AND DISCUSSION

The final sample consisted of 12 articles, which are characterized in Table 2 according to the author (s), year of publication, journal in which the study was published, type of study, methodological approach, Level of Evidence) and Degree of Recommendation (GR), where the research was carried out and objective (s) of the study.

Table 2 - Characterization of the studies included in the final sample - Natal, Rio Grande do Norte (2016).

Author(s) (Year) - Journal	Type of study/ Aproach	NE / GR	Place	Objectives of study
Bierschbach JL, Cooper L, Liedl JA (2004) - J Sch Nurs	Descriptive / Qualitative	4 / A	United States	To describe how nurses working in schools can intervene in the possible complications of using an insulin pump and in assisting and supporting children who are initiating therapy.
Pelletier SD (1992) - J Adv Nurs	Descriptive / Qualitative	4 / A	Australia	To describe the perception of the patient's experience in the use of clinical equipment at the bedside.
Wälivaara B, Andersson S, Axelsson K (2011) - Scand J Caring Sci	Descriptive / Qualitative	4 / A	Sweden	To describe the rationale among general practitioners about the use of distance mobile technology by nurses in home care and nursing homes.
Barnard AG, Sinclair M (2006) - J Adv Nurs	Descriptive / Qualitative	4 / A	Australia	To reflect on how vision in linear perspective influences the practice of nurses and midwives to advance the understanding of clinical practice in technologically intensive environments through the critical analysis of designs constructed by nurses and midwives.
Andersson E, Salickiene Z, Rosengren K (2015) - Nurse Educ Today	Descriptive / Qualitative	4 / B	Sweden	To describe the experiences of nurses with more than two years of experience in the care of terminal patients in surgical wards.
Tunlind A, Granström J, Engström Å (2015) - Intensive Crit Care Nurs	Descriptive / Qualitative	4 / A	Sweden	To describe the experience of performing nursing care in a high-tech intensive care environment.
Zeyfang A, Wernecke J (2014) - Diabetol	Descriptive / Qualitative	4 / A	Germany	To describe insulin therapy in geriatric patients with multiple comorbidities.
Ertin H, Harmanci AK, Mahmutoglu FS, Basagaoglu I (2010) - Nurs Ethics	Descriptive / Qualitative	4 / A	Turkey	To demonstrate the contribution of nurses in addressing the current problem of organ transplantation in Turkey and to reflect on what can be done to improve the efficiency of the system.
Leite JL, Dantas FC, Dantas CC, Erdmann LA, Lima SBS, Barros PO (2010) - Aquichan	Descriptive / Qualitative	4 / A	Brazil	To analyze the forms of care provided to patients with HIV / AIDS from statements by nurses at a university hospital and to propose a model of care based on testimony from nurses to patients with HIV.
Bevan MT (1998) - J Adv Nurs	Descriptive / Qualitative	4 / A	England	To analyze the implications of technology on a domain of nursing practice.
Clifford C (1985) - Intensive Care Nurs	Descriptive / Qualitative	4 / B	England	To illustrate how the use of computers can improve nursing practice.
Murdoch J, Barnes R, Pooler J, Lattimer V, Fletcher E, Campbell JL (2015) - Soc Sci Med	Descriptive / Qualitative	4 / B	England	To understand how nurses implement and integrate telephones and software in decision support and delivery of triage by telephone and computers in primary care.

Source: own research.

As shown in Table 2, the largest number of publications came from Sweden (n = 3, 25%) and from England (n = 3, 25%). In addition, all articles selected are descriptive (level of evidence 4) and 91.7% (n = 11) fall within the qualitative methodological approach. However, despite the low level of evidence in the studies, most have a degree of recommendation considered strong (n = 9; 75%).

The studies included in the final sample of the present study are mostly descriptive (100%) and qualitative (91.7%). In this sense, although the descriptive studies are classified in low level of evidence, they are fundamental when little is known about a specific subject. In addition, research[16] reports that although there is a tendency to consider descriptive studies as 'minor' or restricted use, since they could not make any kind of inference, they can be a management tool of extreme importance for the health system.

In view of this scenario, it is important to highlight the need to carry out research that culminates in the scientific production classified as better evidence, such as experimental studies, in order to contribute to the nursing praxis in health services.

Regarding the qualitative approach, it is recognized the relevance of this method in research involving the human being, since it is a single, multifaceted and complex individuals, considering the importance of knowing the subjective forms of expression of feelings, emotions and perceptions. However, authors[17] attribute significant importance to quantitative studies, since they can point out ways that need to be explored by means that approach the lived experience and the conceptions of the subject in order to understand a certain phenomenon. Table 3 describes the technologies used in nursing care aimed at patient safety.

Table 3 – Description of technologies used in nursing care focused on patient safety - Natal, Rio Grande do Norte (2016).

Technology(s) used in nursing care / Classification of technology type	**Measure(s) applied to patient safety / Patient safety protocol(s)***
Knowledge about the proper use of insulin pumps and attendance to possible complications / Light-hard	Instruction of nurses to diabetic students about how to use the insulin scheme appropriately / P3
Intravenous Infusion Control Device / Hard	Use of device to control intravenous infusion of medication and bedside electrolytes / P3
Mobile technology in nursing home care focused on communication and for diagnostic purposes / Light, light-hard and hard	The tool makes it possible to diagnose certain comorbidities and to monitor the use of medications and allows nurses to direct information directly to the medical record during home visits, favoring access to information from general practitioners at a distance, and facilitating daily work and communication between The team / P2 and P3.
Use of technology (innovative equipment) in obstetric care /Hard	Use of technology to evaluate patients and to control specific aspects of care (e.g., control of intravenous infusions). Information provided by the technology is based on increasingly complex images (ultrasound, x-ray) and interpretation requires specialized professionals who must have a vision beyond P2 and P3 images.
Health education aimed at patients using insulin / Light and Light-hard	Training to instruct the patient about the proper use of insulin therapy. Some tools have been developed to facilitate the treatment of diabetes with insulin, such as the script with printed instructions containing the step-by-step administration and correct insulin / P3.
Use of hemodialysis equipment and the promotion of well-being to patients on dialysis/ Light-hard and hard	Surveillance of biochemical parameters of hemodialytic treatment by nurses / P3.
Diagnosis of brain death and persuasion of the population to be donors of organs and tissues for transplantation / Light and hard	Instead of relying on brief verbal exchanges between physicians and patients and their relatives, nurses may be more successful negotiators because of their closer relationship with patients and family / P2.
Construction of a care model for the care of patients with HIV / AIDS / Light-hard	Caring for biosafety and disease prevention standards; Care for opportunistic infections and subclasses of HIV; Use and administration of the antiretroviral cocktail / P3.
Palliative care: interpersonal relationship, solidarity, sensitivity, flexibility and creativity. Enhancement of knowledge and skills / Light and hard	Improvement of communication among professionals for the effectiveness of terminal patient care / P2.
Use of computer and software skills in nursing	Communication between professionals through a computerized system.

practice / Light-hard and hard	Patient records written more clearly and legibly. Sharing decisions among professionals in real time / P2.
Use of telephone and computers for distance nursing screening in basic care / Light-hard and hard	The software allows communication among professionals related to the history and clinical examination recorded in the real time nursing consultation, allowing the patient to be screened by the multi-professional / P2 team.
Technical equipment such as ventilators, infusion pumps, monitors and dialysis / Hard	The use of monitoring and infusion pumps allows professionals to have more time for patient care. With a modern bed, there is no need to change the decubitus so often to avoid pressure ulcers. The technology is a good tool and safety at work, because it is easier to work with the patient when it is possible to follow the parameters of invasive blood pressure, heart rate and oxygen saturation / P3 and P6.

Source: own research.

* Protocol 1 (P1) - correct identification of the patient; Protocol 2 (P2) - communication between health professionals; Protocol 3 (P3) - improved safety in the prescription, use and administration of medicines; Protocol 4 (P4) – ensures surgery at the intervention site, procedure and correct patients; Protocol 5 (P5) - cleans hands to avoid infection; And Protocol 6 (P6) - reduces the risk of falls and pressure ulcers.

According to Figure 3, it was found that 75% (n = 9) of the articles had light-hard type as an object of study, 58.3% (n = 7) addressed the hard and 41.7% (n = 5) of the publications used light technology.

The discussion about technologies in the field of health gains a broad connotation nowadays and pervades as much by conceptual questions as debates about the implications related to the impacts of the incorporation of technologies in the practice of health services[18].

The insertion of technologies in the health environment raises concern when considering the interface of the idea of dehumanization associated with the use of too much equipment and devices (hard technology) in nursing care. In this sense, there are efforts in the problematization of the knowledge necessary to handle such machinery, which is linked to health care, as well as a huge debate arena that focuses on the nurse's ways of acting with the client in the use of equipment, focusing on the Humanization of care and patient safety[18].

The technological language induces the thinking about some aspects inherent to the fundamental nursing in the interface with the debate around the humanization. In this perspective, the devices incorporated into the care, from their correct handling, communicate information to the nurses about the clinical condition of the patient, so as to enable a set of actions or decision making to be triggered. This reality implies in the possibility of observation of the patient by the nurse, who, in articulation with his/her specific knowledge, enables assistance planning[18].

Another argument is that the nurse when mastering the technologies can subsidize their clinical evaluation supported by a second view, similar to that of an advanced sentinel, since the technologies extend the capacity of reaching the human senses, giving more security in the outlets decision-making in the care of critical patients[19].

The use of technology in care facilitates nurses' work, in that it speeds up, brings greater precision and speed in actions, gives the nursing team more time to dedicate themselves to care, in order to improve the quality of care [19], since the technology saves the nurse time and allows a greater approximation of the patient. In this way, by releasing the nurse from the execution of some technical activities, it can allow the realization of fundamental nursing care, due to the optimization of time [18], ideas that are equally brought by studies included in this bibliometric research.

In agreement with the classification of the types of technologies, 75% of the studies analyzed in the present research addressed the light-hard technology. This type of technology, especially those related to the diagnostic evaluation of the individual, needs to base the work processes in health with the intention of producing patient-centered nursing care, including, in addition to the disease, the subject in its collective context. In this context, the object of care, the means and the purposes that involve the production of care aim at healing and alleviation of suffering, as well as the development of individuals' autonomy to assume their problems and concrete conditions of life[20].

Regarding hard technologies, in 58.3% of the studies analyzed, they permeate the nursing care environment significantly and involve the use of intravenous infusion control devices, hemodialysis equipment, software and

computers, mechanical ventilators and cardiac monitors.

Thus, some important aspects related to hard technologies are evidenced, which include the development and improvement of skills related to the use of specific materials and equipment to provide safe care. In addition, the scientific knowledge related to the use of devices in health care needs to be continuously updated, based on training and improvement of professionals[21].

It is clear that in some areas of care a health production mode prevails that emphasizes the use of hard technologies rather than light-hard and light technologies. Although this study presents a predominance of the involvement of light-hard technologies, the researcher[14] points out that the emphasis on hard technologies is directly related to the current hegemonic model, besides the intrinsic characteristics of the level of complexity that health status of the individual sometimes requires the health-disease process.

In this sense, the low resolution in primary care may be related to the dominant practice of a clinic focused on the prescriptive act and the production of procedures, in a substitutive action to the practice that values the clinic as the expanded exercise of multiple professionals[14].

To overcome this care model, it is necessary to reverse the care technologies to be used in health production. Work processes appear as the main targets of changes in health services, in order to restructure and to organize actions with an emphasis on the user and their needs[14].

However, for the efficiency and efficacy of health care and observance of patient safety, the importance of the union between light-hard and hard technologies in a systematized and organized way according to the needs of the patient is evident.

Regarding the classification of the measures applied by the nursing team in the health services focused on the safe care according to the priority protocols of patient safety, it was verified that 66.7% (n = 8) of the studies related to the (P3), 50% (n = 6) were associated with effective communication between health professionals (P2) and only 8.3% (n = 1) Importance of reducing the risk of development of pressure ulcers (P6). It should be emphasized that the studies did not address the other protocols (P1, P4 and P5).

Regarding the application of safety technologies in the prescription, use and administration of drugs, 66.7% of the studies dealt with this topic. In this perspective, a study [22] shows that the administration of drugs in health services is a dynamic, interdisciplinary and complex process that involves several professional competences, theoretical knowledge, critical reflection, use of advanced technologies, as well as patient participation to ensure high performance for patient safety.

In addition, in order for nurses to be considered suitable for supervising and performing drug administration activities, it is necessary to have the solid theoretical contribution on pharmacodynamics, pharmacokinetics, administration techniques, adverse reactions, drug interactions and monitoring parameters of therapeutic response. The lack of knowledge about these aspects arises, mainly, from shortcomings in pharmacology training applied to care practice[23].

The use of technologies aimed at effective communication among health professionals was treated by 50.0% of the articles analyzed. Thus, research[24] reports that communication among professionals plays an important role in all aspects of health care, as well as being essential to act in the detection of errors.

However, what is perceived in practice is the existence of a vicious circle that needs to be broken so that processes are reviewed and strategies are implemented in order to improve communication and ensure safe care for patients[25].

Regarding the use of technologies to reduce the risk of developing pressure ulcers, in spite of the focus on health services to avoid this problem, only one study (8.3%) brought some considerations about this event.

Even with the low number of studies included in this research that deal with the prevention of the development of pressure ulcers, authors[26] have demonstrated that the monitoring of this type of ulcer is also the responsibility of the nursing team and its occurrence is estimated at 19.5 %, reaching 35% in hospitalized adult patients. This number can be reduced by adopting good clinical practice, including massage, change of position, training and use of the Braden Scale.

However, the difficulties in preventing and treating pressure ulcers are related to the deficiencies in human resources, both in terms of

number and in the capacity and lack of adherence of the team, as well as in the material resources to promote patient comfort and safety, mainly to reposition it properly. Another relevant aspect refers to the lack of standardization of the actions of the nursing team[27].

Regarding the care environment in which the technology was used, 66.7% (n = 8) applied in the hospital setting, 25% (n = 3) in home care and 8.3% (n = 1) in kindergarten schools.

Regarding the health environment in which the technology was used, the hospital was the most important (66.7%). In view of this, a study[28] points out that the hospital environment consists of a place marked by conflicting situations and involves human beings weakened due to disease state. In addition, it is a place that involves a structure equipped with hard technologies, used by professionals in health care, in order to constitute an environment of discomfort and restlessness for the patient.

In compliance with the provision of comprehensive and safe care to the client, nurses must be trained and familiar with all stages of the work process in order to obtain maximum benefit from the technology for the benefit of the patient[19].

CONCLUSION

After analyzing the 12 studies included in the final sample, it was observed that the studies of the descriptive type (level of evidence 4) and qualitative approach were highlighted. In addition, the use of light-hard technology predominated, focusing on the importance of health education, and improving knowledge and skills.

Regarding the measures applied by the nursing team for patient safety in the health services, safety in the prescription, use and administration of drugs in the hospital was the concern of most publications.

Thus, it is pointed out that the use of technologies in the health services can contribute strongly to the safe care. In addition, the relevance of articulation between light, light-hard and hard technologies in the caring process is noticed; however, it is extremely important that professionals have sufficient knowledge and skills to handle such instruments.

Regarding the limitations to the execution of this research, it was confronted with the analysis of descriptive studies only, in order to make it difficult to contribute to the practice based on evidence. Therefore, it is recommended to carry out research that culminates in the publication of studies classified in a higher level of evidence.

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Mailing address:
Andréa Tayse de Lima Gomes
Severino Soares Street - nº 76
ZIP CODE: 59.052-450 Natal/RN - Brazil
E-mail: andrea.tlgomes@gmail.com