

INTEGRATIVE LITERATURE REVIEW ARTICLE

BLOOD STREAM INFECTION RELATED TO CENTRAL VENOUS CATHETER INFECÇÃO DA CORRENTE SANGUÍNEA RELACIONADA AO CATETER VENOSO CENTRAL INFECCIÓN CORRIENTE SANGUÍNEA RELACIONADA CON EL CATÉTER VENOSO CENTRAL

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ABSTRACT

Objective: to identify evidence on the strategies of multidisciplinary teams to minimize bloodstream infection related to central venous catheter handling. **Method:** this is a bibliographic, descriptive, integrative review study. The search was performed in the VHL, in the MEDLINE database, in the SciELO Virtual Library and in the CAPES Portal. Full papers were included, from 2014 to 2018, in English, Portuguese and Spanish. The results were presented as figures, followed by a descriptive analysis of two categories: adherence of the multiprofessional team to prevention measures and bundles to reduce bloodstream infections. **Results:** it is pointed that reached the sample of 11 articles. The findings were concentrated in terms of year and number of studies, mostly 2017 (45%), followed by 2015 and 2016 (18%) and 2014 and 2018 (9%); Regarding the design, there was a higher prevalence, observational, quasi-experimental and cross-sectional studies (18%), followed by randomized clinical trials, systematic, longitudinal and quantitative review (9%). **Conclusion:** it is concluded that the findings presented the most recent care and handling with CVC found in the literature. **Descriptors:** Central Venous Catheters; Infection; Disease Prevention; Delivery of Health Care; Patient Safety; Catheter-Related Infections.

RESUMO

Objetivo: identificar as evidências sobre as estratégias das equipes multiprofissionais para minimizar a infecção da corrente sanguínea relacionada ao manuseio do cateter venoso central. **Método:** trata-se de um estudo bibliográfico, descritivo, tipo revisão integrativa. Realizou-se a busca na BVS, na base de dados MEDLINE, na Biblioteca Virtual SciELO e no Portal CAPES. Incluíram-se trabalhos na íntegra, De 2014 a 2018, em inglês, português e espanhol. Apresentaram-se os resultados em forma de figuras, seguida da análise descritiva de duas categorias: adesão da equipe multiprofissional às medidas de prevenção e *bundles* na redução das infecções da corrente sanguínea. **Resultados:** aponta-se que chegou à amostra de 11 artigos. Concentraram-se os achados, quanto ao ano e número de estudos, em sua maioria, de 2017 (45%), seguido de 2015 e 2016 (18%) e 2014 e 2018 (9%); quanto ao delineamento, houve maior prevalência, estudos observacionais, quase-experimental e transversal (18%), seguidos de ensaios clínicos randomizados, revisão sistemática, longitudinal e quantitativo (9%). **Conclusão:** conclui-se que os achados apresentaram os cuidados e manuseio com CVC mais recentes encontrados na literatura pesquisada. **Descritores:** Cateteres Venosos Centrais; Infecção; Prevenção de Doenças; Assistência à Saúde; Segurança do Paciente; Infecções Relacionadas a Cateter.

RESUMEN

Objetivo: identificar evidencia sobre las estrategias de equipos multiprofesionales para minimizar la infección de la corriente sanguínea relacionada con el manejo del catéter venoso central. **Método:** este es un estudio de revisión bibliográfico, descriptivo, integrador. La búsqueda se realizó en la BVS, en la base de datos MEDLINE, en la Biblioteca Virtual SciELO y en el Portal CAPES. Se incluyeron documentos completos, de 2014 a 2018, en inglés, portugués y español. Los resultados se presentaron en forma de figuras, seguidos de un análisis descriptivo de dos categorías: adhesión del equipo multiprofesional a medidas de prevención y *bundles* para reducir las infecciones de la corriente sanguínea. **Resultados:** se señala que alcanzó la muestra de 11 artículos. Los hallazgos se concentraron en términos de año y número de estudios, principalmente 2017 (45%), seguidos de 2015 y 2016 (18%) y 2014 y 2018 (9%); en cuanto al diseño, hubo una mayor prevalencia, estudios observacionales, cuasi experimentales y transversales (18%), seguidos de ensayos clínicos aleatorios, revisión sistemática, longitudinal y cuantitativa (9%). **Conclusión:** se concluye que los hallazgos presentaron la atención y el manejo más recientes con CVC encontrados en la literatura investigada. **Descriptor:** Catéteres Venosos Centrales; Infección; Prevención de Enfermedades; Prestación de Atención de Salud; Seguridad del Paciente; Infecciones Relacionadas con Catéteres.

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INTRODUCTION

It is understood that in the hospitalization processes in the hospital environment, the use of devices is made and, among these devices, are the catheters. Historically, the use of the central venous catheter in hospitals was historically introduced in the 1940s, being of fundamental importance for the practice of care activities for critically ill patients.¹

It is noted that the rescue and prolongation of life of several patients were allowed through the emergence of multiple techniques and technological development related to vascular access, but their use is not without complications, as it can often evolve to some complication. Therefore, greater attention is needed in health care.²

Concern about health care-related infections (HAI) is not recent, however, it has become a priority theme in the last decade, with the advent of concern for the quality and safety of patients in a hospital setting. Although care and / or assistance bring undeniable benefits to patients, they are not exempt from causing undesirable harm to the patient. Among them are infections of the bloodstream, in which intravascular devices, especially the central venous catheter, are considered the main access routes to the microorganism.³

It is noteworthy that, according to the World Health Organization (WHO), with the creation of numerous strategies for the awareness of health professionals regarding the importance of the practice of safe and quality care, training of the multidisciplinary team was encouraged by investing and facilitating the access and updating of professionals to the materials needed for such practices.⁴

It is emphasized that intravascular catheters are indispensable in health care practice, therefore, being a gateway to the source of bloodstream infection. Approximately 150 million catheters are punctured each year in hospitals, and of these more than five million are central venous catheters. Advances in science and technology have favored the maintenance of longer-term vascular access with greater permeability and frequency of use.⁵

It is estimated that one in twenty hospitalized people have some type of HAI, causing numerous institutional and client losses, increasing the length of stay, treatment expenses, but also antimicrobial resistance, as well as the mortality rate.⁶

It is recognized that central venous catheters (CVC) provide benefits in therapy and are used for diagnosis and treatment, hemodynamic monitoring and delivery of various solutions during patient treatment. As a consequence, there are significant risks during its use, especially catheter-related

bloodstream infection (CRBSI), which is associated with an increase in hospitalization time of up to three weeks, morbidity and mortality and hospital costs.⁷

Much of these bloodstream infections are found to occur in the Intensive Care Unit (ICU) and are associated with CVC, and infection occurs most often by transmigration of bacteria along the catheter-skin connection and may occur by intraluminal infection.⁸

Infections related to health care are ranked as the leading cause of death in reported diseases (one third of them are associated with bloodstream infection) and are the third cause of infections in hospitals. Central venous catheter-related bloodstream infections (CRBSI -CVC) can be highlighted, which, in the treatments, are responsible for the high costs and longer hospitalization.⁹

About 250,000 to 500,000 cases of ICSRC occur in the United States annually, leading to a mortality rate of 10 to 30%. In a study conducted in Brazil in an adult ICU with 33 patients, a total of 50 CVC were diagnosed, 18 with CRBSI; Regarding the outcome, 20% of the patients who presented bloodstream infection died, with an incidence of 1.52 / 1000 catheters per day and a CVC utilization rate of 0.80.¹⁰

In view of the above, these CRBSI rates may vary according to the site and insertion technique, lumen numbers, catheter type and length of stay, however, the incidence of infections in Brazil varies from 32 to 40.4 episodes per 1,000 catheter days and mortality attributed to this topography ranges from 6.7% to 75.0%.¹¹

In Brazil, in 2010,¹¹ the systematization of epidemiological data on ICSR-CVC in an Intensive Care Unit was generated through the creation of FormSUS. Among the findings, it was found that the infection rate is 4.8 infections per 1,000 CVC / day by 2017, as well as ICU-related CVC infections, and their mortality rate can reach up to 69% of the patients.

Based on a study carried out at the Edvaldo Mota Adult Intensive Care Unit of the Deputy Jandhuy Carneiro Regional Hospital in the city of Patos (PB) in 2017, 80% of nurses did not wash their hands before noninvasive procedures; invasive ones reach 53%; of the nursing technicians, in relation to noninvasive procedures, 60% intended to wash their hands before the procedures and 80% after, and in relation to the invasive ones, 56% pretended to wash their hands before the procedures and 96%, after procedures.¹²

It is noteworthy that a very important requirement for all health professionals is to offer safe and quality care and not cause harm to life. However, it is emphasized that in many cases the client does not receive care correctly and properly, which can bring several problems to

their health, and one of them is the ICSRC, as evidence shows that millions of people suffer disabling injuries that can even lead to death as a result of these failures in hospital care, making patient safety of great importance.¹³

Despite the fact that, in today's reality, the practices and preventive and control measures of the ICSR-CVC are increasing in hospitals, there are unsatisfactory levels in health care, and the indicators become recognition for multi-professional teams take concrete measures that interfere with results, minimizing risks and adopting measures and practices to ensure quality and safe care.¹⁴

We highlight the concern about the risks of infection to which patients are exposed, the prevalence of ICSR-CVC, the need for improvements in care with the insertion and maintenance of deep venous catheters, and the adoption of evidence-based measures to support the care of the health team.¹²

It is pointed out, in fact, that the use of care, with rules defined in protocols and guidelines, confers safety and quality at work, effectively affecting the reduction of health care-related infection rates.⁹

It is noteworthy that the multiprofessional team involved with direct patient care has the responsibility to be empowered about the knowledge of prevention of HAI. Thus, by means of systematic, evidence-based care, quality care is provided in the work provided, thus seeking to contribute to safer and more comfortable care for the patient.

In this study, the following guiding question is established: "How has the multiprofessional team been presented in the scientific literature regarding strategies to minimize central venous catheter-related bloodstream infection?"

OBJECTIVE

- To identify evidence on multiprofessional team strategies for minimizing central venous catheter-related bloodstream infection.

METHOD

It is a bibliographical, descriptive study, integrative review type. It was developed with the purpose of gathering and summarizing study findings through different methodologies, which provides the synthesis of knowledge in evidence in order to contribute to the deepening of studies and knowledge related to the investigated theme and the applicability of significant results in the practice.¹⁵

As for methodological rigor, the integrative review adopted six phases: the first determines the study question; the second, the establishment of criteria for inclusion and exclusion of studies / sampling or literature search; The third phase extracts relevant data from the selected articles; the fourth phase, the critical analysis of each data of the studies included in the research; the fifth phase discusses the results found and the sixth phase presents the integrative review.¹⁶

In March and April 2019, the research was conducted at the Virtual Health Library (VHL), the MEDLINE database, the Scientific Virtual Electronic Library Online (SciELO) and the Periodical Portal of the Virtual Library of the Higher Education Personnel Improvement (CAPES).

The Boolean operator "AND" and the descriptors in Health Science (DeCS) used to search for the articles were: "Venous Catheters" AND "Infection" AND "Disease Prevention". It is observed that the aforementioned controlled descriptor "Disease Prevention" during the search of articles was replaced by the uncontrolled descriptor "Prevention".

The following inclusion criteria were listed in this study: articles available in full, online and published between 2014 and 2018. It is noted that this choice was due to the emergence of a technical, normative and official document of the National Agency for Sanitary Surveillance (Anvisa), in 2013, bearing in mind the theoretical foundation, since, previously, there was no specific technical material that standardized these measures in Portuguese, English and Spanish.

Exclusion criteria are duplicate, incomplete articles, theses, dissertations, books and those that do not address the subject of this study.

Being aware of the ethical aspects, the study will respect the guidelines and criteria established in Resolution 466/12 of the National Health Council (NHC), even being an integrative review, because the ethical precepts established with regard to care The copyright of the researched articles and the integrity of the authors in the citations were considered throughout the construction process of this work.

The articles were searched through the descriptors (DeCs - Health Descriptors) and their respective correspondents in the English and Spanish languages, as shown in figure 1.

	English	Spanish	Portuguese
Descriptors	<i>Central Venous Catheters</i>	<i>Catéteres Venosos Centrales</i>	<i>Cateteres Venosos Centrais</i>
	<i>Infection</i>	<i>Infecção</i>	<i>Infecção</i>

Figure 1. Descriptors and their equivalents in Portuguese, English and Spanish. Uberlandia (MG), Brazil (2019).

It was realized after the initial collection that data refinement would be necessary due to the

high number of results found. Figure 2 shows the search for the associated descriptors.

Descriptors	Source researched				Total
	SciELO	BVS	CAPES	MEDLINE*	
Central Venous Catheters	19	1890	96	11726	
Infection	8037	856407	14969	1614932	
Prevention of diseases*	6866	1479909	19263	1644174	
Total	14922	2338206	34328	1817455	4204911

Figure 2. Descriptors individually searched. Uberlandia (MG), Brazil (2019). * For the search, the uncontrolled descriptor "Prevention" was used.

The term "AND" was used in all research modalities, since among the inclusive criteria were articles in Portuguese, English and Spanish, as

shown in figure 3, for which the DeCs indexed descriptors were used.

Descriptors	Sources researched				Total
	SciELO	BVS	CAPES	MEDLINE*	
Central Venous Catheters	57	1887	94	11726	2153
Central Venous Catheters AND Infection	28	317	18	5014	419
Central Venous Catheters AND Infection AND Disease Prevention #	10	123	6	39	178
Total	95	2327	118	16779	2750

Figure 3. Crossing of the descriptors searched. Uberlandia (MG), Brazil (2019). * Filters used: ten years, free full text, review, human. #Uncontrolled descriptor "Prevention" used for searching. Uberlandia (MG), Brazil (2019).

In the flowchart below, the intersections between the descriptors and boolean terms "Central Venous Catheters" AND "Infection" AND "Disease Prevention" are presented, and the research resulted in 178 articles: ten in the SciELO Virtual Library; 123 on the VHL regional portal; six in the CAPES Portal and 39 in the MEDLINE database via PubMed. After the removal of nine duplicate articles, 169 publications totaled.

As shown in Figure 4, the titles and abstracts were read in order to refine the sample by applying the inclusion and exclusion criteria, selecting 16 articles. After reading the texts in depth, five articles that did not answer the guiding question were excluded. Thus, the final sample consisted of 11 studies. Articles were stored, once the sample was defined, in virtual

databases. According to Figure 4, the flowchart of data collection and selection of the studies that make up the sample are presented.

The method was used to classify the evidence levels of the articles, showing that the level of evidence in science corresponds to the approach taken to classify the evidence strength of scientific studies, presenting them in the analysis and interpretation of results.¹⁷

In this study, after the process of analysis and interpretation of results, two categories were established: adherence of the multi-professional team to preventive measures and bundles to reduce bloodstream infections.

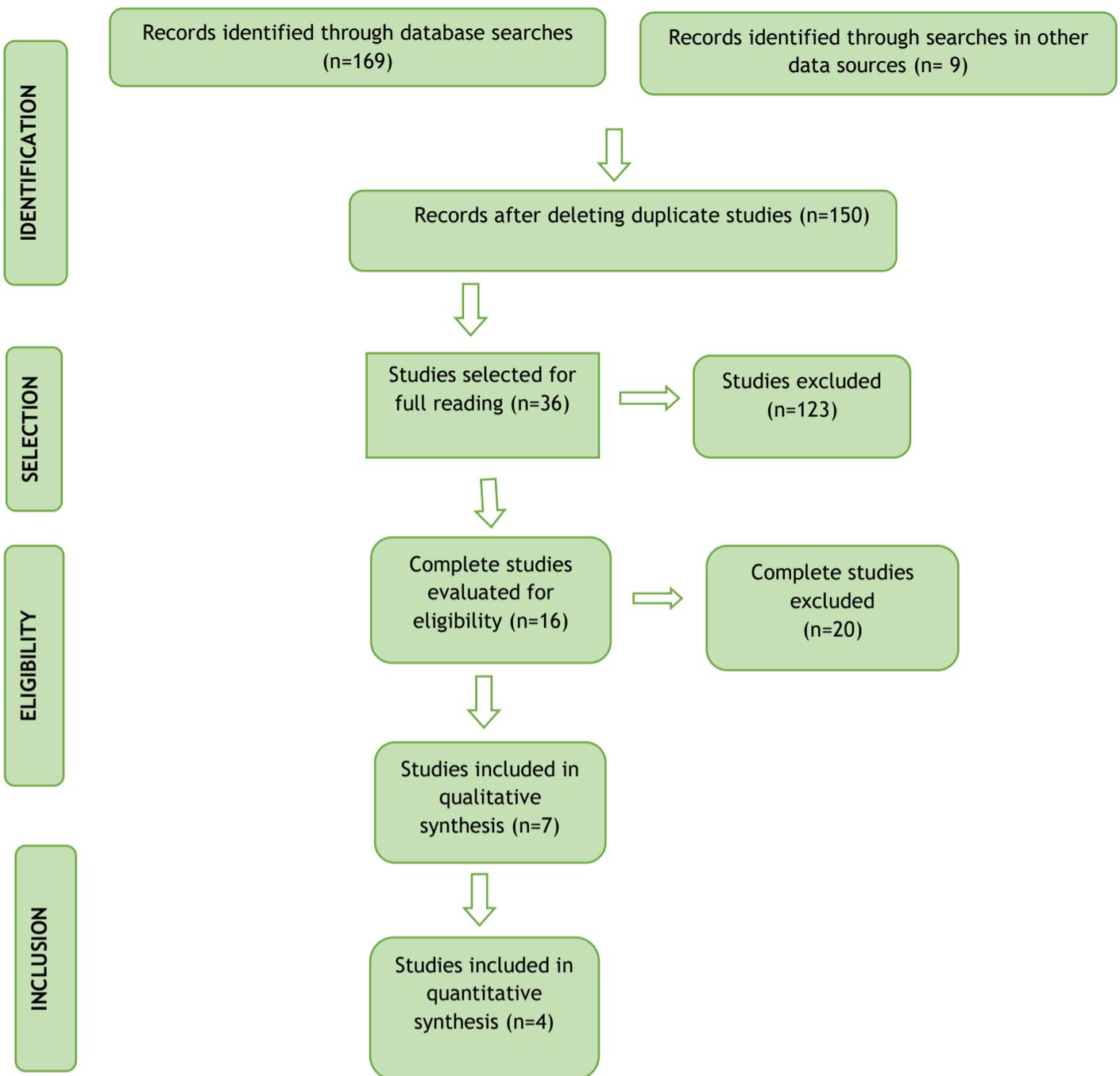


Figure 4. Flowchart of study selection according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyzes (PRISMA 2009). Uberlandia (MG), Brazil, 2019.

RESULTS

After the process and searches in the databases established for the research, 11 articles were selected. The findings were organized in table form, for the best identification of each selected publication, with the following information:

alphanumeric sequence, starting at A1 through A11; author / year; publication title; periodic; goal; methodology; level of evidence and narrative passage (Figure 5).

Nº	Author/Year	Title	Journal	Objective	Methodology	Level	Narrative Excerpt
A1	Silva, Oliveira (2017) ¹⁸	Adherence to measures to prevent central venous catheter-related bloodstream infection	Nurs Focus	To verify the adherence of the multidisciplinary team to measures to prevent central venous catheter-related bloodstream infection.	Quasi-experimental study	2A	Most professionals did not perform hand hygiene before and after the following practices evaluated: infusion system change (89.7%); medication administration (72.9%); dressing change and dressing (73.1%).
A2	Perin, Erdmann, Higashi, Sasso (2016) ¹⁹	Cautionary evidence for prevention of central venous catheter-related bloodstream infection: systematic review	Latin-Am J Nursing	To identify evidence of care for the prevention of central venous catheter-related bloodstream infection in adult patients in Intensive Care Units.	Systematic review	5B	Significant results have been shown in reducing bloodstream infection rates after care implementation. Care, from insertion, maintenance of central venous access, as important strategies for education, safety and surveillance processes.
A3	Dantas, Oliveira-Figueirêdo, Nobre, Pimentel (2017) ²⁰	Nursing staff adherence to bloodstream infection prevention measures	J Nurs UFPE online	To evaluate the knowledge and adherence of the nursing staff to measures to prevent central venous catheter-related bloodstream infections (ICSR-CVC) in an intensive care unit.	Descriptive Study	6A	Regarding the knowledge of ICSR-CVC prevention measures recommended by the CDC and ANVISA, 72.7% participants could not mention them. Of the six participants who opined, four (66.6%) cited the use of aseptic techniques; three (50%) hand hygiene; three (50%), dressing aseptically; two (33.3%), catheter hub asepsis; and two (33.3%), the use of maximum protective barrier.
A4	Oliveira, Ferreira, Araujo, Bessa, Moraes, Stipp (2017) ²¹	Positive Deviance as a strategy for the prevention and control of intensive care bloodstream infections	Schoo Nurs Journ USP	Describe the application of positive deviation as a strategy to prevent and control bloodstream infections.	Longitudinal study	4A	In teams, low adherence to IPCS prevention best practices was identified, such as: previous disinfection of infusion systems; incorrect use of the maximum barrier; flaws in vascular access dressing techniques; lack of nurse supervision; improper hand hygiene and improper handling of overcoats for contact precautions / isolation.
A5	Walz, Mack, Ellison, Flaherty, Mellwaine, Whyte et al., (2015) ²²	The Plus Package: The Effect of a Multidisciplinary Approach to Eradicate Axis-Associated Bloodstream Infection	Anesthesiology News	Describe a multidisciplinary approach to reducing central line-associated bloodstream infection	Observational study	4A	In summary, the use of a multimodal approach to the treatment of catheters, including chlorhexidine-impregnated dressings and anti-infectious catheters, has been associated with a 92% reduction in bloodstream infection.
A6	Silva, Oliveira (2018) ²³	Impact of bundle implementation on reducing bloodstream infections: an integrative review	Text context-nurs.	To analyze national and international scientific productions on the impact of bundles on the prevention of central venous catheter-related bloodstream infection in an adult intensive care unit.	Systematic review	5A	Implementing bundles reduces CVC-related bloodstream infections, regardless of intervention time and amount of measures used.

A7	Oliveira, Stipp, Silva, Frederico, Duarte (2016) ²⁴	Behavior of the multidisciplinary team against the Central Venous Catheter Bundle in Intensive Care	Anna Nery Schoo Nurs Journ	To analyze the behavior of nursing and medical teams related to the insertion bundle and good practices in the management of the central venous catheter.	Cross-sectional study	4B	On updating the ICSRC theme, the higher level is updated through articles and participation in congresses and the middle level through continuing education. Of the 76 professionals surveyed, 9.21% did not perform any type of update and 71.05% (n = 27) of higher education professionals and 55.26% (n = 21) of medium level.
A8	Fortunatti (2017). ²⁵	Impact of two bundles on central catheter-related infection in critically ill patients	Latin-Am J Nursing	To evaluate the impact of implementing insertion and maintenance bundles on central venous catheter-related bloodstream infection rates in an Intensive Care Unit.	Quasi-experimental study	2A	It was observed that the maintenance bundle achieved overall compliance of 62.9%, reaching its minimum at the beginning of the intervention (52.5%) and the maximum at the end (71.2%)
A9	Dolci, Margatho, Silveira (2017) ²⁶	Length of stay of chlorhexidine gel dressing in central venous catheter in critically ill patient	Anna Nery Schoo Nurs Journ	To identify the residence time of the chlorhexidine gel dressing applied to the insertion site of the central venous catheter; describe reasons for change and identify the amount used by an adult patient admitted to the ICU.	Quantitative study	6B	The chlorhexidine gel dressing is recommended for seven days, however, in this study, this dressing rarely remained this period, and its average length of stay was shorter than the indication for use.
A10	Pedrolo, Danski, Vayego (2014) ²⁷	Chlorhexidine dressing and gauze and central venous catheter tape: randomized clinical trial	Latin-Am J Nursing	To evaluate the effectiveness of chlorhexidine antimicrobial dressing, comparing it with gauze and tape.	Randomized Clinical Trial	2A	Good dressing fixation was obtained (83.72% - CHG; 90.48% - GAZE); The fixation of the dressing demonstrated that, in a unit that implements a catheter bundle, the chlorhexidine antimicrobial dressing is not effective in reducing IPCS when compared to the gauze and tape dressing.
A11	Oliveira, Caetano, Silva, Almeida, Rodrigues, Siqueira (2015) ²⁸	The use of clinical indicators in the assessment of bloodstream infection prevention and control practices	Text context-nurs.	To evaluate the compliance of the practice of prevention and control practices of venous catheter-related bloodstream infection through clinical indicators.	Observational, Sectional	4A	According to the results reported in this study, it is believed to have identified relevant factors to explain the adherence or not of professionals regarding the practices of prevention and control of infection with short-term central venous catheter, from the application of indicators of which pointed out that the standards, even though they are known to all and established, are still not adequately met in practice.

Figure 5. Summary of results included in the review. Uberlandia (MG), Brazil (2019).

The results are presented after applying the inclusion and exclusion criteria, concentrating the findings regarding the database, year of publication and number of studies, and four (36.37%) were published in the Virtual Library SciELO; three (27.27%) in the VHL; two (18.18%) in Portal Capes and two (18.18%) in MEDLINE via PubMed; Regarding the year in which the articles were published, 2017 was highlighted, with the largest number of publications, totaling five (45.46%), followed by 2015 and 2016, both with four publications (18.18%), and from 2014 and 2018, both with two publications (9.09%).

The most prevalent designs were two observational studies and two quasi-experimental studies, both with 18.18%, four studies, followed by randomized controlled trials, systematic, cross-sectional, integrative, descriptive, longitudinal and quantitative review, with one study each (9.09%), totaling seven studies.

DISCUSSION

After analyzing the articles, two categories were established for a better understanding of the results, as follows: adherence of the multidisciplinary team to preventive measures and bundles in reducing bloodstream infections, allowing to know and better clarify the main factors that relate to preventive measures for controlling bloodstream infection.

It is noticed that all this information aims to discuss and evaluate the research already carried out on the subject, and the final synthesis of the analysis of the studies allowed consolidating the results found as well as better understand the proposed theme for the study, and contribute to the scientific environment and society.

Among the 11 articles analyzed, four studies were presented that presented, as a theme, the behavior of the multiprofessional team facing the bundles; five articles concerned prevention measures and two articles related to dressing types and length of stay. The results of this analysis were grouped into two categories discussed below.

It is noted, regarding the growth of scientific production about bloodstream infection related to the use of the central venous catheter, that there was an increase in production from the year 2013. This fact can be justified in Brazil by the publication of ANVISA's manual on health care-related infection prevention measures, which deals with patient safety, and quality in health services appears as a priority.

1. Adherence of the multidisciplinary team to prevention measures

Prevention measures are listed in the adherence category of the multiprofessional team. Five articles^{18-21,28} that sought to characterize adherence to preventive measures by health

professionals who provide health care directly to the patient were evaluated.

Health professionals have poor adherence to measures to prevent CVC-related bloodstream infections, especially with regard to drug administration by CVC, dressing manipulation, and hand hygiene.²⁸ In the studies analyzed, poor adherence to hand hygiene was revealed before and after manipulation of CVC by the multidisciplinary team. A global rate of 38.7% was scored, with 30% being simple hygiene and 8.7% alcoholic friction.¹⁸

It is emphasized that when hand hygiene practice does not occur properly, it is favored the cross-transmission of microorganisms, especially in critically ill patients who are more likely to be colonized or infected.¹⁹

Most professionals, around 72%, could not describe the main maintenance measures instituted by the Disease Control and Prevention (CDC) and ANVISA, namely: hand hygiene before handling the CVC; the use of sterile gloves to handle the catheter at the time of dressing; the use of 0.5% alcoholic chlorhexidine for dressing during dressing; assessment of catheter insertion daily to monitor for signs of infection and hub disinfection prior to drug administration.²⁰

It was shown that part of the nursing professionals reported performing CVC maintenance measures, such as disinfection of ampoules, vials and the hub "and the external tip of the CVC where the catheter equipment and / or syringe connection" is made. For medication administration, however, the execution of these measures was not visualized when observing the care provided by the team. It is assumed from these findings that the team knows the importance of such practices but does not adhere to them routinely in their praxis.²¹

2. Bundles in Reducing Bloodstream Infections

In the bundles category in reducing bloodstream infections, six articles were evaluated, where four²²⁻⁵ sought to know bundles as an auxiliary method in reducing bloodstream infection and their outcome, and two²⁶⁻⁷ presented discussions about types of dressings most commonly used in fixation, length of stay and means of conducting efficiently throughout its use. It is reported that prevalence measures the efficiency of bundles in a hospital environment with assistance directly to critically ill patients.

It is noteworthy that, with the use of an appropriate and efficient approach to bundles, there was a 92% reduction in central venous catheter-related bloodstream infection.²²

The risks of bloodstream infection are also related to the anatomical site of catheter insertion, higher for femoral insertion and lower for subclavian, whose predominant factor is the amount and diversity of microorganisms found in each one of the above regions.²³

It is noticed that the maximum precautionary barrier consists in the dressing with sterile glove, cap, mask, overcoat and sterile field, which contributes to reduce the microbiota contamination of the professional and the environment for the patient at the time of insertion of the CVC and the subsequent risk of infection.²³

Skin preparation with 0.5% alcohol chlorhexidine is indicated prior to central venous puncture, and it is recommended that it should be allowed to dry before insertion of CVC, as this was not observed by 28.95% of upper level professionals and by 21.05% of the mid-level, skin preparation is essential for prevention and one of the important measures of prevention packages. This promotes a residual effect, reducing the spread of extraluminal microorganisms toward the catheter insertion site.²⁴

Another factor that favors the reduction of central venous catheter-related bloodstream infections (ICS - CVC) is the inclusion of 2% chlorhexidine bath, as the use of chlorhexidine replacing the bath soap is based on the reduction of the bacterial load on the patient's skin that can enter the bloodstream via the extraluminal pathway of the CVC. Chlorhexidine bath is recommended when basic measures for the prevention of ICS - CVC do not work as expected; however, its use is justified when ICS - CVC rates are above institutional limits.²⁵

It is pointed out that the impact of performing hand hygiene (MH) is expressed through health care-related infections, given that this action is recognized as the main intervention in infection control, including the lack of adherence by health professionals to MH protocols considered as violation. The Multimodal Strategy for the Improvement of Hand Hygiene emphasizes the importance of creating an environment that enables awareness at all levels to be implemented as a top priority.²⁴

It was found that occlusive dressings should be replaced as recommended, as skin moisture and the presence of dirt and secretions promote an environment conducive to microbial growth. The dressing made with sterile gauze should be changed within 48 hours due to the difficulty of visualizing the insertion site and the possibility of moistening it during the bath. In addition, the semi-permeable transparent polyurethane dressing allows for insight into the insertion site and therefore requires less frequent changes and may remain up to seven days or whenever it is dirty, loose or damp.²⁶

It was evidenced that in 52% of the catheters analyzed, the dressing presented poor fixation and required early exchange. It is noteworthy that the good fixation of dressings, evidenced in this research, is a determining factor for the maintenance of the occluded dressing, which

contributes to the reduction of pericatheter skin colonization.²⁷

It is known that disinfection of the hub prior to drug administration should be done by alcohol friction for 15 to 30 seconds to prevent / reduce the spread of microorganisms present in the hub to the inner lumen of the catheter. Due to its relevance, this measure was transformed into a campaign by the Association for Professionals in Infection Control and Epidemiology, called "Scrub the Hub", whose purposes were: reduce infections, educate, raise awareness and encourage professionals to disinfect the hub carefully before any handling. It has since been widely disseminated and recommended.^{23,28}

However, it has been shown that the categories reveal how research on bloodstream infection is being presented. Studies have become the subject of the multidisciplinary team adherence to prevention measures and bundles in reducing relevant bloodstream infections as they contribute to the construction of knowledge, which meets the prevention of bloodstream infection related to the central venous catheter.

The importance of health professionals being prepared for the development of skills aimed at insertion, handling and maintenance practices of central venous catheters is revealed. The relevance of the construction of knowledge for practice regarding health care-related infections is perceived, since the rate of infections in Brazil is increasing due to new epidemiological data.

CONCLUSION

It is noteworthy that CVC is widely used in institutionalized patients, especially those admitted to the ICU. This route of access sometimes becomes indispensable in the treatment of such patients; however, the risks of using this device for the patient still have a very high recurrence. It is understood that the participation of the multidisciplinary team as risk minimizing agents is extremely important in maintaining the quality of care for the patient, since these professionals need to base their care actions on scientific evidence.

It is known that the Hospital Infection Control Commission (HICC) plays an important role in hospital institutions, in the search for prevention and control of infections, in which it develops a set of deliberate and systematic actions, aiming at the maximum reduction of the incidence and severity, being the ideal nurse professional to compose the team, with management skills, service quality assessment and care practices.

It is concluded that the proposed objective was achieved, since relevant factors were identified to explain the lack of adherence to prevention measures and bundles by multiprofessional teams regarding CVC-related infection prevention and control practices. One of the limitations found was

in the contents of specific studies that show the lack of adherence actions by multiprofessional teams regarding preventive measures.

It is evident, therefore, that the incorporation of joint actions in the care of the CVC has proved to be the best way to provide care to patients with this device, promoting greater safety and reducing the costs of possible prolonged hospitalization due to health care-related infections.

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