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INTEGRATIVE LITERATURE REVIEW

PATIENT SAFETY IN HEMODIALYSIS SEGURANÇA DO PACIENTE EM HEMODIÁLISE SEGURIDAD DEL PACIENTE EN HEMODIÁLISIS

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ABSTRACT

Objective: to analyze the literature on the safety of patients on hemodialysis. *Method:* this is a bibliographical, descriptive study, of integrative review type, through research in articles published between the years 2006 to 2016, in Portuguese, English or Spanish; collected in the databases Medline, Lilacs, BDENF and SciELO Virtual Library and the results presented in figure. *Results:* the sample of this study was composed by six articles. The information after article analysis was grouped into three categories: patient safety on hemodialysis; factors that affect patient safety on hemodialysis and strategies for patient safety on hemodialysis. *Conclusion:* it is important that the hemodialysis team deepens their knowledge about patient safety to proactively act in the prevention of adverse events, thus ensuring patient safety and a better quality of life for patients with illness renal disease on hemodialysis. *Descriptors:* Patient Safety; Nursing; Renal Dyalisis; Nursing Care; Nephrology Nursing; Nursing Assessment.

RESUMO

Objetivo: analisar a literatura acerca da segurança do paciente em hemodiálise. Método: trata-se de um estudo bibliográfico, descritivo, tipo revisão integrativa, por meio de pesquisa em artigos publicados entre os anos de 2006 a 2016, em português, inglês ou espanhol; coletados nas bases de dados Medline, Lilacs, BDENF e Biblioteca Virtual SciELO e os resultados apresentado em figura. Resultados: compôs-se a amostra deste estudo por seis artigos. Agruparam-se as informações após a análise dos artigos, em três categorias: segurança do paciente em hemodiálise; fatores que afetam a segurança do paciente em hemodiálise e estratégias para a segurança do paciente em hemodiálise. Conclusão: torna-se importante que a equipe da hemodiálise aprofunde os seus conhecimentos acerca da segurança do paciente para atuar, de forma proativa, na prevenção de eventos adversos garantindo, assim, a segurança do paciente e uma melhor qualidade de vida ao paciente com doença renal crônica em tratamento hemodialítico. Descritores: Segurança do Paciente; Enfermagem; Diálise Renal; Cuidados de Enfermagem; Enfermagem em Nefrologia; Avaliação em Enfermagem.

RESUMEN

Objetivo: analizar la literatura acerca de la seguridad del paciente en hemodiálisis. *Método:* se trata de un estudio bibliográfico y descriptivo, revisión de tipo integrador, a través de los artículos de investigación publicados entre 2006 a 2016, en portugués, Inglés o Español; recogidos en las bases de datos Medline, Lilacs, BDENF y Biblioteca Virtual SciELO y los resultados presentados en figura. *Resultados:* se compuso la muestra de este estudio por seis artículos. Se agruparon las informaciones después del análisis de los artículos, en tres categorías: seguridad del paciente en hemodiálisis; factores que afectan la seguridad del paciente en hemodiálisis y estrategias para la seguridad del paciente en hemodiálisis. *Conclusión:* es importante que el equipo de la hemodiálisis profundice sus conocimientos acerca de la seguridad del paciente para actuar de forma proactiva en la prevención de eventos adversos garantizando así la seguridad del paciente y una mejor calidad de vida al paciente con enfermedad renal crónica en tratamiento hemodialítico. *Descriptores:* Seguridad del Paciente; Enfermería; Diálisis Renal; Atención de Enfermería; Enfermería en Nefrología; Evaluación en Enfermería.

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INTRODUCTION

Patient safety is defined by the World Health Organization (WHO) as reducing the risk of unnecessary harm associated with health care to an acceptable minimum where the minimally acceptable relates to current information, available resources and the context in which assistance is provided.¹

The topic of patient safety is increasingly being disseminated within institutions and among health professionals in the quest for the quality of care provided and the occurrence of the fewest possible avoidable incidents.²

It is interesting to note that the occurrence of adverse events (AE) involves considerable social and economic costs, which may lead to irreversible damages to patients and their families.³

Discussions on patient safety in the scientific and care setting have been expanded since the occurrence of adverse events has been increasing in the hospital institutions representing a serious public health problem.⁴

AE can result from problems in the practice of care, products, processes or systems. The health system is a complex organization and the occurrence of AE is a consequence of a chain of systemic factors that include structure, organization of work processes, culture, quality management approach, the prospection of risks and the capacity to learn from mistakes.⁵

In this context, it is important to create a safety culture, since it enables health institutions to identify and manage prospective safety issues in their daily work, especially in situations and / or scenarios with potential such as hemodialysis procedures.

Hemodialysis is considered to be a complex procedure with many potential sources of risks patients. damages to Performing hemodialysis safely requires the development of procedural steps that include the creation of the dialyser and other equipment, access to the bloodstream and patient follow-up, as well as possible complications, to ensure stability hemodynamic⁶. In this type of procedure, considering the complexity, the frequency to which patients are submitted, the potential risk factors and the high use of technologies, it is important to evaluate the issues related to patient safety.

Hemodialysis units are known to be susceptible to adverse events (AE), as they present several risk factors such as: the nature of the procedure (invasive); complex equipment; critical patients; patient turnover

and administration of potentially dangerous drugs such as heparin.⁷

Adverse events in institutions with a safety culture are anticipated as a preparation for dealing with them at all levels of the organization. This provides its employees with tools to develop the skills to convert such adverse events into improved system resistance.⁸

With this study, the possibility of producing knowledge about the theme widely discussed in the world spectrum is glimpsed: patient safety.

OBJECTIVE

• To analyze the literature on patient safety in hemodialysis.

METHOD

It is a bibliographical, descriptive study, type integrative review of the literature; through research on articles published between the years 2006 to 2016.

Searches were carried out in the Medline databases, Latin American and Caribbean Literature in Health Sciences (Lilacs), Scientific Electronic Library Online (SciELO) and Nursing Database (BDENF) with the following descriptors: renal dialysis, patient, Nursing, nursing care. The descriptors were defined by the DeCS, accessing the Virtual Health Library (VHL) (http://decs.bvs.br). The descriptors in English were also used: dialysis, patient safety, nursing and nursing care. And, whose research question was: "What are the scientific publications about hemodialysis patient safety strategies?". With the analysis the complete articles, online, Portuguese, English or Spanish.

The Boolean operators and, or, and and not were used using the following combinations: renal dialysis AND patient safety; renal dialysis AND Nursing; renal dialysis AND nursing care; renal dialysis AND patient safety AND Nursing; renal dialysis AND patient safety AND nursing care; patient safety AND Nursing; patient safety AND nursing care; renal dialysis OR patient safety; renal dialysis OR nursing care; renal dialysis AND NOT Nursing. The same combinations were made with the English descriptors.

The following inclusion criteria were adopted: studies addressing the safety of adult patients with chronic renal disease on hemodialysis; in Portuguese, English and Spanish; in the years 2006 to 2016; with full text and free access. There was no restriction on study design. Duplicate articles were

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excluded from the study and did not address the research question.

The data was collected until January 2017. The studies were analyzed in full with the aid of a data collection instrument specific to the type of method, evaluating the data referring to the identification of the journal, the author, the institution of study, type of study, methodology used, main results and conclusions. Data was categorized according to the Bardin Content Thematic Analysis technique.

RESULTS

From a universe of 88,982 articles was born to carry out the combinations. Using the combinations described above, in the English and Portuguese languages, a total of 167 articles were identified. After reading the abstracts, 48 articles were selected. A careful reading was performed, and 42 articles did not meet the previously established inclusion criteria. Thus, the sample of this study was composed by six articles, according to figure 1.

N	Article	Journal	Authors	Year	Objective	Type of	Location	Level of
٠						study		evidence
1	Adverse Safety Events in Chronic Kidney Disease: The Frequency of "Multiple Hits	Clin J Am Soc Nephrol	Chapin et al.	2010	Determine the proportion of patients experiencin g potentially dangerous events.	Observation al retrospectiv e cohort study	University of Maryland School of Medicine	3
2	Evaluation of the conformity of the care practice of maintenanc e of the temporary double lumen catheter for hemodialysi s	Latin-Am Journal of Nursing	Rosetti KAG; Tronchin DMR	2014	Evaluation of the conformity of the care practice of maintenanc e of the temporary double lumen catheter for hemodialysi s	Observation al exploratory- descriptive quantitative study	São Paulo	3
3	Chronic Kidney Disease Adversely Influences Patient Safety	J Am Soc Nephrol	Seliger et al.	2008	To analyze safety events in patients with CKD	Cross- sectional study	University of Maryland School of Medicine	3
4	Adverse events on hemodialysi s: reports of nursing professional s	Jour Esc Nurs USP	Sousa et al.	2013	To analyze the knowledge of nursing professional s about adverse events	Cross- sectional study with a quantitative approach	Federal University of Goiás	4
5	How safe is renal replacemen t therapy? A national study	Nephrol Dial Transplan t	Bray et al.	2014	Identify the types of adverse events	Retrospectiv e case review study	King's College London	4

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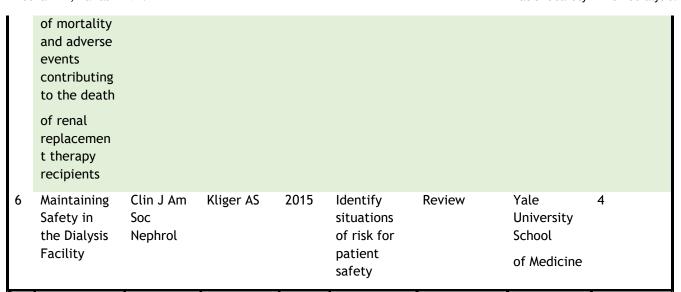


Figure 1. Scientific production on hemodialysis patient safety strategies from 2006 to 2016. Brasília (DF), 2016.

The information after article analysis was grouped into three categories: patient safety on hemodialysis; factors affecting patient safety on hemodialysis and strategies for patient safety in hemodialysis.

DISCUSSION

♦ Patient safety on hemodialysis

A proportion of people with chronic kidney disease (CKD) who experience safety-related events are reported. This factor highlights the vulnerability of this population to the potential adverse effects of medical care. 9

It is known that chronic kidney disease (CKD) is a multi-attribute condition that has the potential to increase the risk of errors and failures in patient safety. People with CKD have higher rates of hospitalization, which makes them susceptible to interventions with the potential for errors. 10

It is explained that patients with CKD have hemodialysis as one of the treatment modalities. In relation to the Hemodialysis Service, it is emphasized that the treatment is complex, with specific activities, requiring adequate structure and trained professionals for a safe care practice, which, if not respected, could cause irreversible damages to the user.¹¹

It is noteworthy that medical care for patients receiving renal replacement therapy (RRT) is complex and technology-dependent. Patients have a high comorbidity burden, polypharmacy, and the physiological consequences of established kidney disease mean that patients on RRT are potentially vulnerable to medical errors. 12

There can be costly consequences related to safety events, for patients and for health networks, increasing length of stay, readmissions in the hospital and risk of death.⁹

It is understood that adverse events (AE) are incidents that occur during the delivery of health care and result in harm to the patient that may be physical, social and psychological, which includes illness, injury, suffering, disability or death.¹

It is noted that hemodialysis units are sites susceptible to the occurrence of adverse events (AE), since they present several risk factors such as: invasive procedures; use of complex equipment; critical patients; high turnover of patients and administration of potentially dangerous drugs such as heparin. A study was carried out in four US hemodialysis units, identifying, in a period of 17 months, the occurrence of 88 adverse events during 64,541 dialysis treatments (one case in 733 treatments).⁷

It is pointed out that the presence of infection in the population in RRT is a complex problem: it is common (the prevalence of septicemia in dialysis patients is more than 100 times higher than in the population) and multifactorial, general associated with high hospitalization rates, to risks of infection and immunosuppression as a consequence of renal impairment, comorbidities and immunosuppressive therapy. 12

It should be noted that bloodstream infections and other infections are the leading causes of death and hospitalization among hemodialysis patients second only to cardiovascular disease. 13

The clinical condition of the patient was reported in greater proportion, in relation to the main causes of AE. Such conditions directly influence the occurrence of AE, especially in patients in a severe condition, due to their instability and the need for interventions that make them particularly vulnerable to adverse events.¹⁴

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CKD is also associated with pathophysiological changes such as anemia, osteopenia, susceptibility to hypervolemia, electrolyte abnormalities and infection, which may increase the risk of adverse medical care complications. 10

It was identified, in one study, that individual failures were the second most cited cause for the occurrence of AE. There are several psychological and physiological factors that can influence the behavior of professionals during care and interfere with patient safety. Among the most frequent are lack of cognitive (situational), social (teamwork) and personal (stress).¹⁴

In the daily routine of nursing care, the amount of personnel directly influences the implementation of measures that may favor the adoption of new cultures, favoring the quality of care. It is in this context that the design of Nursing staff is a priority because it interferes in the administrative process and in the consequent planning of the assistance.¹⁵

It should be noted that 48% of the nursing professionals in the hemodialysis unit work from 50 to 70 hours a week, increasing the imminent risk of failure during the care delivery. The risks of the professional making a mistake increase significantly when the working day is more than 40 hours per week, when the work shifts exceed 12 hours or when overtime is performed.¹⁴

◆ Factors Affecting Patient Safety on Hemodialysis

It is shown in one study that about half of the participants presented one or two safety events. Diabetic patients were 2.9 times more likely to have three or four adverse safety events compared to non-diabetic patients. In addition, patients in stage five of CKD were 2.8 times more likely than patients in stage three of CKD to undergo several safety events during the study period.⁹

These data are reinforced by the statement that patients with CKD are more vulnerable to safety flaws related to their clinical condition. CKD is a significant risk factor for many safety events. Direct complications of RRT were responsible for 2.1% of deaths and 3.5% of deaths.¹²

A study was conducted in the Pennsylvania Patient Safety Authority, an independent agency in the United States of America responsible for taking measures to reduce and eliminate health care failures, in order to understand the types of errors and the AEs that occurred during to hemodialysis. 526 reports of hemodialysis-related related to the one-year period were analyzed. Medication errors prevailed (28.5%)

followed by failure to execute the protocol (12.9%). Then, they appeared: laboratory errors or blood bank (9.9%); complication of procedure (8.6%); disconnection of the needle (6.1%); puncture infiltration (6.1%); falls (5.9%); equipment failure (4.8%); coagulation of the hemodialysis system (4.4%); posthemodialysis events (3.8%); pressure ulcer (3.8%); skin lesions (1.9%) and others (3.3%). 16

It should be emphasized that the areas identified as predisposing to adverse events in hemodialysis patients are: hyperkalemia; hypoglycemia; prescription of medicines safely; prevention and treatment of infection and vascular access for hemodialysis. 9,12

In the dialysis services, innumerable patients are simultaneously treated in the same environment, which favors the dissemination of microorganisms through direct or indirect contact through devices, equipment, surfaces or hands of health professionals, which evidences the need to perform hand hygiene before and after contact with the patient.¹¹

Hand hygiene is recognized as essential to prevent the transmission of disease. Central venous catheter infections for hemodialysis are associated with a 15- to 33-fold increase in bloodstream infections when compared to arteriovenous fistulas.¹³

It is recalled that complications associated with vascular access and catheter can be serious, causing a high risk of morbidity and mortality for patients. It is the role of nurses to monitor, detect and intervene in complications that occur during hemodialysis sessions, considering their specialty and their responsibility in relation to the hemodialysis unit, which is a differential for achieving safety and quality in the hemodialysis procedure.¹⁴

It was found, through authors, that in the hand hygiene component, there were a considerable number of opportunities that demonstrated the fragility in adherence to practice.¹¹

CKD is also characterized by impaired renal clearance of numerous medications increasing the risk for incorrect dosage and toxicity of therapeutic agents.¹⁰

It is evident in the hemodialysis community that medication errors are reported as the most common event in patient safety. Medication errors are common among dialysis patients and frequently occur as omission errors. 9,13

It is inferred that, in addition to errors of omission, errors also occur during medication administration such as heparin infusion errors, the transfer of inadequate information

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about patients' medications during transitions between the hemodialysis unit and other areas of hemodialysis care and lack of communication of medication orders.¹³

Another event in the analyzed articles was found in the catheter obstruction. The obstructed catheter is one of the types of adverse events reported by 100% of professionals. Occurs when there is clot formation in the lumen of the catheter preventing blood flow from the patient's body to the hemodialysis machine.¹⁴

Events of hyperkalemia and hypoglycemia were individually found. These are common adverse safety events as well as risk factors for mortality in patients with CKD.⁹

Accidental withdrawal of the needle that punctures the arteriovenous fistula as one of the most dangerous AEs in hemodialysis units may be considered, since the patient may bleed to death within a few minutes. Thus, it is necessary that Nursing adopt measures that reduce the risk of occurrence of this event.¹⁴

The infiltration of hemodialysis access and coagulation of the hemodialysis circuit were also mentioned. Blood coagulation of the extracorporeal system usually occurs in the sessions performed without heparin due to contraindication of the drug.¹³⁻⁴

Finally, it contributes to the high rates of morbidity and mortality observed in patients with CKD due to the high incidence of safety events.⁹

♦ Strategies for patient safety in hemodialysis

It protects the patient's safety from the risks involved in health care in order to minimize these risks, in addition to reducing or eliminating Adverse Events, which are incidents that result in harm to the patient.¹

The quality of care and the outcome of patients are improved by the prevention of adverse events. 9

Quality is understood through the incessant search for identifying the failures in procedures and practices that organize the actions leading to the improvement of processes and results and aiming at the conformities established by the regulatory agencies and the satisfaction of users.¹¹

It has become a national priority to reduce medical errors and improve patient safety. Patients with chronic kidney disease (CKD) may be at increased risk of adverse health care outcomes, but few studies have evaluated this issue. 10

The safety culture in the field of health organizations is receiving increasing attention. Increasingly complex healthcare increases the potential for accidents, errors

or failures. Injuries or injuries resulting from the care provided are a serious problem related to the performance of health services and unsafe health care causes significant morbidity and mortality worldwide.³

The process of working for the elaboration of protocols becomes more efficient and the assistance becomes more uniform. Professionals should be aware of adverse events and their impact on health care, since the incidence of these events is an important indicator of quality.¹⁴

Nursing professionals are responsible for a large part of the care actions and, therefore, they are in a privileged position to reduce the possibility of incidents reaching the patient, as well as to detect the complications early and to perform the necessary behaviors to minimize the damages.¹⁴

A good suitability of hemodialysis is maintained in patients with chronic renal disease, depending directly on an efficient Vascular Access (VA) whose complications are highly representative of the morbidities in this group. Considering the importance of VA, it is worth mentioning that the efficacy of the therapy is closely associated with its adequate implantation, handling and monitoring, affecting the quality of the dialysis and, consequently, the patient's well-being and survival.¹¹

Adverse events related to vascular access are avoided through improvements in care processes used by Nursing, as well as by constant evaluation of the results of the practices adopted.

It is observed that the Nursing team of hemodialysis units must have knowledge about the adverse events to be able to identify the risks and the situations that allow their occurrence with the intention of seeking alternatives to minimize the failures, adopt methods of risk analysis and, thus ensuring the quality of service.¹⁴

Strategies to improve patient safety in dialysis units are emphasized by the importance of effective communication, reduction of medication errors, correct dialysis, equipment preparation and infection control.¹²

It is an incentive to practice hand hygiene as one of the nine patient safety solutions launched in 2007 in the Nine Patient Safety Solutions program. Hygiene is considered the primary preventive measure to avoid damages to patients.¹¹

It is revealed that the above theme is recurrent in the health services and treated as a priority by the programs and initiatives that focus on patient care safety, such as the

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World Alliance for Patient Safety, a WHO initiative that has dedicated efforts in elaboration of guidelines and strategies for implementation of measures including adherence to the practice of hand hygiene and, more recently, in Brazil, by the Ministry of Health Ordinance No. 5,299 / 2013, which instituted the National Patient Safety Program.¹⁷

The system must be structured in a secure way in organizations, helping professionals not to make mistakes. All causes should be analyzed by the risk management service for the development of corrective actions aimed at the prevention and reduction of adverse events.¹⁴

Among the suggestions to prevent the occurrence of adverse events, continued education was mentioned as the main measure and as an important action for the formation and development of human resources. The nursing team of a hemodialysis unit should develop skills to detect and prevent adverse events adopting strategies to improve the care processes developed in daily practice.¹⁴

Organizations with a positive security culture are characterized by communications based on mutual trust, common perceptions of the importance of security, and confidence in the effectiveness of prevention measures.¹³

It is suggested that in the occurrence of an incident the important thing is the assimilation that the cause of errors and adverse events is multifactorial and that health professionals are susceptible to commit them when the technical and organizational processes are complex and poorly planned.¹⁴

Dialysis centers are properly operated as highly reliable organizations for improving patient safety. ¹³

The need for specialized care for the CKD population is demonstrated by the high frequency of different safety events observed. Providing safe care for this population therefore provides some unique challenges.

CONCLUSION

Patient safety issues are discussed quite frequently nowadays; however, the scientific literature on this subject in the area of hemodialysis is still scarce.

Hemodialysis is a sector that requires the use of technologies and depends on a highly trained and qualified team. It is reported that the occurrence of adverse events is frequent, not only those related to hemodialysis treatment, but also to the patient's own

clinical condition, which predisposes him to the occurrence of these events.

It is imperative that the hemodialysis team deepens their knowledge about patient safety to proactively act to prevent the occurrence of adverse events, thus ensuring patient safety and a better quality of life for patients with illness renal disease in hemodialysis treatment.

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