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BIOSAFETY MEASURES IN NURSING CARE TO HEMODIALYSIS PATIENTS: INTEGRATIVE REVIEW

MEDIDAS DE BIOSSEGURANÇA NA ASSISTÊNCIA DE ENFERMAGEM A PACIENTES HEMODIALÍTICOS: REVISÃO INTEGRATIVA

MEDIDAS DE BIOSEGURIDAD EN LA ATENCIÓN DE ENFERMERÍA A PACIENTES EN HEMODIÁLISIS: REVISIÓN INTEGRADORA

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Objective: to understand the knowledge of nursing professionals about biosafety measures in the prevention of health problems during hemodialysis care. Method: integrative review of the literature performed in LILACS and BDENF databases and in the directory of SciELO journals. 691 works were identified. After the inclusion and exclusion criteria were applied, the final sample consisted of 12 articles. Results: nursing professionals partially adhere to biosafety measures and understand their need, as well as have knowledge about the theme, even though this same knowledge has not been applied in its entirety in care. Conclusion: professionals have knowledge about biosafety measures and recognize the need for their application as an effective instrument in the performance of their work activities, adopting and recommending their use. However, there are gaps in knowledge between discourse and care practice.

Descriptors: Nursing. Hemodialysis. Occupational Risks. Accident Prevention. Containment of Biological Risks.

Objetivo: compreender o conhecimento dos profissionais de enfermagem acerca das medidas de biossegurança na prevenção de agravos à saúde durante a assistência em hemodiálise. Método: revisão integrativa da literatura realizada nas bases de dados da LILACS e BDENF e no diretório de revistas da SciELO. Foram identificadas 691

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obras. Após aplicados os critérios de inclusão e exclusão, a amostra final foi composta por 12 artigos. Resultados: os profissionais de enfermagem aderem parcialmente às medidas de biossegurança e compreendem sua necessidade, assim como detêm conhecimento sobre a temática, muito embora esse mesmo conhecimento não tenha sido aplicado em sua totalidade na assistência. Conclusão: os profissionais detêm conhecimento acerca das medidas de biossegurança e reconhecem a necessidade da sua aplicação como instrumento efetivo no desempenho das suas atividades laborais, adotando e recomendando a sua utilização. No entanto, existem lacunas do conhecimento entre o discurso e a prática assistencial.

Descritores: Enfermagem. Hemodiálise. Riscos Ocupacionais. Prevenção de Acidentes. Contenção de Riscos Biológicos.

Objetivo: comprender el conocimiento de los profesionales de enfermería sobre las medidas de bioseguridad en la prevención de problemas de salud durante el cuidado de la hemodiálisis. Método: revisión integradora de la literatura realizada en bases de datos LILACS y BDENF y en el directorio de revistas SciELO. Se identificaron 691 obras. Después de aplicar los criterios de inclusión y exclusión, la muestra final consistió en 12 artículos. Resultados: los profesionales de enfermería se adhieren parcialmente a las medidas de bioseguridad y comprenden su necesidad, así como tienen conocimiento sobre el tema, a pesar de que este mismo conocimiento no se ha aplicado en su totalidad en el cuidado. Conclusión: los profesionales tienen conocimientos sobre las medidas de bioseguridad y reconocen la necesidad de su aplicación como un instrumento eficaz en el desempeño de sus actividades laborales, adoptando y recomendando su uso. Sin embargo, existen brechas en el conocimiento entre el discurso y la práctica del cuidado.

Descriptores: Enfermería. Hemodiálisis. Riesgos Laborales. Prevención de Accidentes. Contención de Riesgos Biológicos.

Introduction

Hemodialysis is a clinical procedure used in the blood filtration process, performed when there is an organic dysfunction that makes it impossible to filter by the renal system, which is attributed, among other functions, to the filtration and excretion of substances, which, when in excess, are harmful to the body, such as: urea, uric acid, creatinine, potassium, sodium and others[1].

Health care for hemodialysis patients with Chronic Renal Failure (CRF) is supported by Ordinance n. 3,415 of the Ministry of Health (MH) of October 22, 2018, which establishes standards and guidelines for the adequacy of health facilities and/or specialty centers for hemodialysis[2].

Biosafety is understood as the set of actions that envision the minimization of risks and/or the prevention of adverse events, which may compromise the health of professionals and/or users. Biosafety measures are elaborated through the development of scientific research, tests and technical improvements, which seek to qualify techniques and procedures, in order to maximize the quality of care and the safety of the professional during the performance of procedures[3].

A study conducted in a hemodialysis service of a private in-hospital institution, contracted to the *Sistema Único de Saúde* (SUS), in southern Brazil, with 46 nursing workers, showed, in the midst of its results, 17.4% of occurrence of work accidents[4].

Due to the intrinsic contact with the patient, concerning health care, nursing professionals are commonly exposed to numerous risks of infection by pathogens, which become more evident when they are not respected by biosafety standards and guidelines, as established in regulatory standard 32 (NR-32), of the *Ministério do Trabalho e Emprego*, providing for safety and health at work in health services[5].

Regarding the treatment of hemodialysis patients, nursing professionals are constantly exposed to risks of contamination by aerosols and secretory fluids, in addition to the work accident itself by handling needlestick equipment and contaminated materials, which are listed as occupational risks[6].

This study is justified due to the low support of nursing professionals to biosafety measures in the care environment, given that, although they curse disciplines that address this theme during the various undergraduate courses in health, few hold and/or apply this knowledge in its entirety in care practice, aspects observed by the researcher in the midst of the curricular internships in nursing.

Thus, the study becomes relevant for the promotion of constructive discussions in the health field, in view of biosafety measures in the work environment of health establishments that work in hemodialysis, given the risks inherent to the activities of professionals, and this theme should be discussed and developed, especially with the nursing team, for being the largest professional category, as well as those who assist patients directly and continuously.

In this context, the study aimed to understand the knowledge of nursing professionals about biosafety measures in the prevention of health problems during hemodialysis care.

Method

This is an integrative review of the literature, with a descriptive focus, on biosafety measures in nursing care for hemodialysis patients.

Integrative review is a scientific tool and/or method that envisions substantiating knowledge about a specific area through a systematic and scientifically based process[7].

To perform this type of study, it is necessary to observe six steps, namely: elaboration of the fundamental question of the study, search and selection of studies, collection of research data, critical evaluation of the findings, synthesis of the results and presentation of the method[8].

The main question of the study was elaborated based on the Population, Variables and Outcomes (PVO) strategy, which envisions the meeting of the appropriate answers to the research questions, with a view to a better understanding of social aspects, context and their variables, as exemplified in Chart 1.

Chart 1 – Preparation of the guiding question based on the Population, Variables and Outcomes strategy. Juazeiro do Norte, Ceará, Brazil – 2020

Strategy Items	**Components**	***Descritores em Ciências da Saúde (*DeCS*)***	**Medical Subject Headings (MeSH)**
Population	Nursing professionals	*Enfermagem*	Nursing
Variables	Hemodialysis assistance	*Hemodiálise*	Renal Dialysis
Variables	Work accidents	*Riscos Ocupacionais*	Occupational Risks
Variables	Prevention of health problems	*Prevenção de Acidentes*	Accident Prevention
Outcomes	Biosafety	*Contenção de Riscos Biológicos*	Containment of Biohazards

Source: Created by the authors.

After using the PVO strategy, the main question of the study consisted of: What is the knowledge of nursing professionals about biosafety measures in the prevention of health problems during hemodialysis care?

The search for the articles was carried out by two researchers, independently, from April to May 2020, in the databases of the Latin American and Caribbean Literature on Health Sciences (LILACS) and in the Nursing Database (BDENF), as well as in the journal directory of the Scientific Electronic Library Online (SciELO), through the crossing of *Descritores em Ciências da Saúde* (DeCS) and Medical Subject Headings (MeSH): *Enfermagem* (Nursing), *Hemodiálise* (Renal Dialysis), *Riscos Ocupacionais* (Occupational Risks), *Prevenção de Acidentes* (Accident Prevention), *Contenção de Riscos Biológicos* (Containment of Biohazards), with the use of the Boolean operator AND.

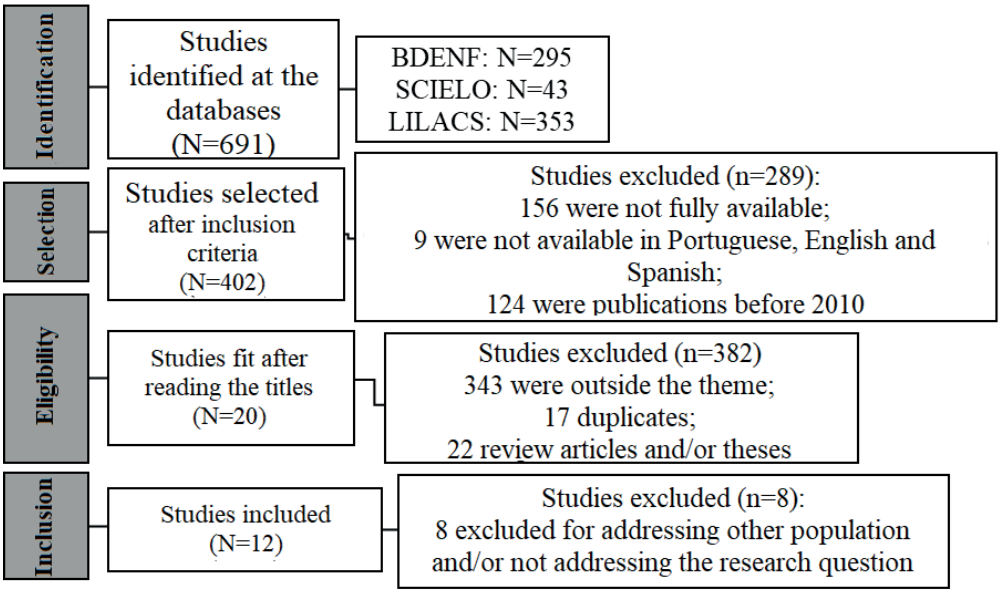
The inclusion criteria defined were: studies fully available, of the primary scientific article type, published between the years 2010 and 2020, in English, Portuguese and Spanish. One of the versions of duplicated studies in the databases, which did not fit the proposed theme and/or did not respond to the study question, was adopted as exclusion criteria, review articles, dissertations and theses, identified after reading the title and abstract in full.

A total of 691 studies were identified, and after applying the inclusion and exclusion criteria, the final sample of this review was composed of 12 articles, as elucidated in Figure 1.

To favor the extraction of significant information from the studies, a database was elaborated in the Microsoft Office Word program (version 2019), in which the codification, registration and categorization of the studies were performed, based on the synthesis of the articles included in the integrative review, according to the title, authors, year of publication, database, journal and main results. It should be noted that the checklist Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was used in the items in which it was applicable.

In relation to ethical and legal aspects, it is noteworthy that this study was not submitted to the Research Ethics Committee, since its scientific profile (integrative review) has no need for ethical evaluation, according to Resolution n. 466/2012. However, concerning the principles of authorship, all the literature used for the construction of the article was duly cited and referenced.

Figure 1 – Study selection flowchart according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses



Source: Created by the authors.

Results

After the strategy of searching for articles, identification, selection, eligibility and inclusion, 12 studies were obtained that summarized the main findings about biosafety measures in nursing care for hemodialysis patients, as shown in Chart 2.

Chart 2 – Synthesis of articles included in the integrative review. Juazeiro do Norte, Ceará, Brazil – 2020

(continued)

Article title	Authors / year	Databases	Journal	Main results
Social representations of biosecurity in nursing: occupational health and preventive care	Sousa AFL, Queiroz AAFLN, Oliveira LB, Moura MEB, Batista OMA, Andrade D, 2016[3]	BDENF	*Revista Brasileira de Enfermagem*	Professionals have difficulty in converging training and performance with speech and practice, represented by the non-use of Personal Protective Equipment (PPE), when necessary. It is noticed that the use of PPE seems to be only a theoretical activity, which has no space in their work routine, although it is largely indicated for standard precautions. The results of this research indicated that the participants understand biosafety as activities that lead to greater or lesser risk, highlighting as a concern mainly those diseases transmitted by aerosols.
Occupational risks faced by the nursing worker in a unit of hemodialysis	Correa RA, Souza NVDO, 2012(9)	BDENF	*Revista de Pesquisa Cuidado é Fundamental Online*	The workers judged the length of service in the sector, self-confidence, experience and resistance as factors that hinder the use of PPE by nursing professionals in the hemodialysis sector. Thus, workers do not believe in the contamination of the material they handle, being exposed to occupational hazards present in that sector. Low adherence to PPE was reported by most nursing professionals.
Dialytic unit as a scenario of exposure to risk	Morais EM, Fontana RT, 2014(10)	LILACS	*Revista de Pesquisa Cuidado é Fundamental Online*	The most referenced occupational hazards were biological, chemical, physical and ergonomic, and, less frequently, psychosocial. The strategies pointed out to reduce risks involve the use of PPE, care with body posture and the provision of adequate furniture by the institution.
Occupational risks in hemodialysis system processing	Hoefel HHK, Lautert L, Fortes C, 2012(11)	BDENF	*Revista Eletrônica de Enfermagem*	Professionals cleaned their hands after all 36 (100%) procedures for treating hemodialysis filters. At that time, they failed on 6 (17%) occasions in the aseptic technique, contaminating the surfaces with the gloves used. Although some type of PPE has always been used, its use was incomplete, for example, protection with glasses for personal use, when a protector that covered a larger surface around the eyes would be ideal, according to international recommendations.

Chart 2 – Synthesis of articles included in the integrative review. Juazeiro do Norte, Ceará, Brazil – 2020

(continued)

Article title	Authors / year	Databases	Journal	Main results
Nurses' knowledge about work accidents	Melo FMS, Oliveira BSB, Oliveira RKL, Bezerra JC, Silva MJN, Joventino ES, 2017(12)	LILACS	*Revista Rene*	It was found in the study that professionals have knowledge about prevention and post-exposure measures to biological material. The ten respondents reported the frequent use of PPE and the disposal of sharps in an appropriate place. However, none of the nurses interviewed mentioned, among post-exposure care, the use of alcohol gel at 70% for hand antisepsis, and this practice should be routine regardless of the occurrence.
Contextual meanings and the needlestick accident: repercussions for nursing care	Rosa LS, Valadares GV, Pedreira QDM, Ribeiro LR, 2018(13)	LILACS	*Revista Enfermagem UERJ*	Professional experience and respect for biosafety regulations can minimize exposure to risks. The professional's unpreparedness, expressed by the lack of knowledge about the correct use of standard recommendations and by the lack of skill in performing the procedures, can facilitate the occurrence of accidents with sharps. The lack of professional training contributes to the professional's vulnerability.
Applying precaution and prevention in the workplace	Carvalho EC, David HMSL, 2016(14)	BDENF	Revista Enfermagem UERJ	Prevention is about certain and proven risks (danger). Precaution is linked to simply potential risks. In prevention, the danger is already established, the danger is concrete. In precaution, on the contrary, there is an abstract danger (risk), due to the imprecision of scientific knowledge, incapable of measuring the damage, or even providing certainty as to the current or supervening occurrence of damage.
Preventive measures in the practices of hemodialysis catheter's insertion and manipulation: observational study	Duarte TAC, Alencar TD, Custódio N, 2017(15)	BDENF	*Revista Enfermagem Atual In Derme*	In the study, 94% (n=58) of hand hygiene practices were non-compliant in the pre-and 82% (n=47) in the post-handling of the hemodialysis catheter.

Chart 2 – Synthesis of articles included in the integrative review. Juazeiro do Norte, Ceará, Brazil – 2020

(continued)

Article title	Authors / year	Databases	Journal	Main results
Work incidents with biological material in the nursing team of a hospital in Mid-Western Brazil	Carvalho DC, Rocha JC, Gimenes MCA, Santos EC, Valim MD, 2018(16)	BDENF	*Escola Anna Nery*	The survey shows that only 42.6% of professionals participated in training on standard precautions in 2016. In the period from 2008 to 2015, a total of 36 professionals were obtained who received training (57.1%) and 15 (23.8%) professionals who did not respond to this information. Only 64.9% of workers carried out the exchange of sharps disposal container when 2/3 of filling was reached. Regarding the use of PPE, only 95 workers (64.2%) reported using closed, waterproof and non-slip shoes, as per the NR-32 standard. Ten professionals (6.8%) claimed not to have received the adequate and complete vaccination schedule for Hepatitis B. Likewise, 19 professionals (12.8%) reported that they are unaware of their vaccine response, that is, they do not know if they are really immunized with the anti-Hepatitis B antibody, while 92 (71.3%) of the workers stated that the test result was negative.
Compliance of hand hygiene in maintaining the catheter for hemodialysis	Rosetti KAG, Tronchin DMR, 2015(17)	SciELO	*Revista Brasileira de Enfermagem*	It was found that in 1,902 hand hygiene opportunities there was 35.6% adherence to the practice after contact with the patient, and only 13.8% before contact with the patient. Most of the results point to the low adherence of health professionals, which represents a major challenge in the prevention and control of infections related to health care.
Insertion of central vascular catheter: adherence to infection prevention bundle	Llapa-Rodríguez EO, Oliveira JKA, Melo FC, Silva GG, Mattos MCT, Macieira Jr VP, 2019(18)	SciELO	*Revista Brasileira de Enfermagem*	The results affirm that the instruments for verifying care processes present better adherence when there is improvement in the work process, awareness of the team in the implementation, accountability for the application of the instrument and continuous assessment regarding adherence to the checklist.

Chart 2 – Synthesis of articles included in the integrative review. Juazeiro do Norte, Ceará, Brazil – 2020

Article title	Authors / year	Databases	Journal	Main results
Evaluation of the conformity of assistential practice in the maintenance of the temporary double-lumen dialysis catheter	Rosetti KAG, Tronchin DMR, 2014(19)	SciELO	Revista Latino-Americana de Enfermagem	Regarding the use of a mask, the results showed that its use by the professional in connection and disconnection from the hemodialysis service was met in most evaluation opportunities, with 99.4% being in compliance during the connection and 100% in the disconnection. In this study, it was found that, in the hand hygiene component, despite the predominance of compliance (130-83.9%), a considerable number of opportunities were non-compliant (25-16.1%), demonstrating the fragility of adherence to practice.

Source: Created by the authors.

The results of this research were based on the detailed evaluation of the selected studies and subsequent comparative analysis of the studies before the proposed research object. Thus, the knowledge of nursing professionals about the basic measures of biosafety in nursing care to hemodialysis patients, the implications of this practice and the gaps in knowledge were evaluated.

Discussion

In view of the construction of the study through the selected and analyzed articles, the main measures related to biosafety and the contributing and/or hindering factors for non-follow-up to their basic precepts were investigated, which may represent risks to the health of professionals while developing their work activities.

Thus, after data analysis, the main barriers to the implementation of biosafety measures were listed, such as a deficit in the application of theoretical knowledge in labor practice, lack of training of personnel through continuing education and the negligence of some professionals, which can promote the development of occupational accidents in the care environments.

In this context, in order to favor a better understanding of the results obtained in the study, there was the fragmentation of the discussion of the data into two categories, including: "Biosafety in the hemodialysis environment" and the "Difficulties for the implementation of biosafety measures".

Biosafety in the hemodialysis environment

Nursing professionals understand the need for biosafety, as well as have knowledge about the theme, its objective and its aspects. However, this same knowledge has not been used in its entirety in practice, given the failures mentioned in the studies, before, during and/or after the implementation of care, due to factors such as: lack of adequate structure of the establishment, lack of materials and equipment and the professional's own negligence.

Although some professionals follow the norms guided by NR-32[5], the studies state that it is evident that some individuals violate biosafety measures, either by their own choice or for other reasons, such as: lack of adequate PPE for carrying out procedures and/or for specific sectors; inadequate and/or non-existent training regarding the use of PPE; lack of adequate

structures in establishments for the correct hygiene of hands; and outdated vaccination card.

In most studies, among biosafety practices, the one considered the simplest and that has greater applicability in the work environment is hand hygiene, and that health professionals have knowledge that the use of soap and water contributes to the prevention of infections.

Studies show that the application of biosafety measures in health environments is seen as a way to promote risk mitigation, a measure that should be recommended and encouraged by the maintaining institutions, and employed by professionals, aiming to minimize and/or eliminate risks of contamination, which is an essential practice in the hemodialysis environment[20].

Corroborating the findings of this research, the hemodialysis sector is considered as an environment with great potential risk of accidents, because professionals are constantly exposed to risks of contamination, including: contact with secretions, body fluids and blood, either during the puncture of the arteriovenous fistula, manipulation of catheters and/or needlestick materials[6].

he use of biosafety devices begins with the adoption of measures considered basic, called standard precautions, which are: hand hygiene, the use of PPE and Collective Protection Equipment (CPE), the adequate management of health service waste and the immunization of health professionals[21].

For the organization and implementation of biosafety practices, the proper management of waste produced by health services is listed as one of its main elements, since these establishments are responsible from their generation to their final destination. The implementation of a waste management system in health services enables risk reduction, safe work, careful handling, storage, safe transportation of sharp materials and their disposal in an appropriate place, actions that can favor the minimization of the risk of work accidents and less exposure to biological materials[21-22].

In addition to the findings of this study, a study conducted at the *Hospital das Clínicas Dr. Alberto Lima*, in the state of Amapá, states that the disposal of needlestick materials in an inappropriate place can contribute to the occurrence of accidents, being one of the main cause of occupational risk factors for health professionals, especially the re-covering of needles as responsible for a considerable margin of accidents[22].

However, contemporary studies state that, despite having knowledge about biosafety practices, professionals do not apply to praxis, given the existence of errors in performing the correct hand hygiene technique in the five moments recommended by the World Health Organization (WHO)[23].

In this context, the *Agência Nacional de Vigilância Sanitária* (ANVISA) describes hand hygiene as one of the main strategies for infection prevention, which should be performed by all health professionals in the field of work, in the five moments recommended by the WHO, namely: before touching the patient, before performing a clean/aseptic procedure, after risk of exposure to body fluids, after touching the patient and after touching surfaces close to the patient[24].

Furthermore, alcoholic friction with alcohol can be performed as a hygiene technique with 70% alcohol, since there are no visibly dirty, and should last between 20 and 30 seconds. This practice is highly effective, as long as it is performed in the five recommended moments, for reduction and/or elimination of microbial growth[24].

Regarding the use of gloves, this study evidenced that its use occurs partially, despite its recommendation in order to avoid the probability of contact of the professional with body fluids, secretions and/or unhealthy skin. In this context, it is also noteworthy that the use of the mask and goggles are also recommended to avoid contamination by aerosols. However, results similar to this study are mentioned in a study on nursing care for patients with chronic kidney

disease with fistula infection, in which the low use of the aforementioned PPE was evidenced[25].

The provision of proactive attitudes towards the promotion of biosafety measures by professionals contributes substantially to the prevention of accidents in the health field, which favors the maintenance of the safety of professionals and patients, through the application of technical standards and their knowledge regarding the risks to which they are exposed during their care activities[26].

In the midst of contemporary studies, the use of PPE is clearly the main way to promote the reduction of the permanent risks of exposure of health professionals to communicable diseases, especially those resulting from contact with blood and/or body fluids[26].

However, despite the recommendations for use and the knowledge of professionals on the importance of PPE, some gaps were found in the knowledge regarding their non-compliance during the care of hemodialysis patients, either due to the lack of these instruments in some health units, the non-adequacy of the PPE to the work environment and/or the professional's own negligence regarding its use[27].

Difficulties for the implementation of biosafety measures

In view of the findings of the study, it was found that some studies presented the main causes that hinder the use of biosafety measures, such as: lack of PPE and updates of use through training; establishment structures outside the correct standards; intrinsic aspects of the professionals themselves, who commonly neglect the use of precautions, due to the long period of work in the sector, which culminates in the reduction of the fear of being contaminated; and the correct non-disposal of sharp-needle materials.

These aspects, which, in a view, are responsible for the non-observance of nursing professionals working in hemodialysis centers to the basic principles of biosafety, which evidences the need for this theme to be continuously discussed, analyzed and worked on in the work environments.

In the provision of nursing care, professionals may neglect the biosafety standards, such as the non-use of PPEs, which are more used in the care of patients, whose diagnosis is known, underestimating the vulnerability of the human organism to infections. Thus, health professionals should use all PPE during the development of their care activities, with or without risks of contact with biological materials[28].

The promoting factors of the low adherence of professionals to biosafety measures in health units are: the non-execution of updates on the subject, through continuing education; negligence combined with unawareness of biosecurity; excessive confidence in their practical capacity; the low perception that professionals have about the risks to which they are exposed and their susceptibility; and their discredit regarding the PPE[29].

Thus, in view of the research findings, factors were found that act as barriers to the use of biosafety measures in hemodialysis institutions, among which we can mention: the time of service in the sector, excessive self-confidence, experience and resistance of professionals to continuing education measures. These actions hinder the correct use of biosafety measures by nursing professionals active in these care sectors[9].

This aspect culminates in the expression of a high risk of exposure of professionals to occupational accidents in these sectors, since they do not believe in the risk of contamination by biological materials, fluids, secretions and needlestick materials, which are in intrinsic contact daily[9].

Corroborating the evidenced in the studies, among the challenges experienced for the execution of the basic principles of biosafety, we highlight the non-adequacy between theory and practice, lack of adequate materials and the relaxation of some professionals in relation to their self-care, not following or not performing the appropriate prevention measures[30].

In the analysis of the research data, it was evidenced that relatively simple measures, such as hand hygiene and/or friction with alcoholic solution and the use of PPE during work activities, play a fundamental role for risk mitigation. These measures should be encouraged by health facilities and used correctly by their professionals, thus envisioning the elimination and/or mitigation of risks arising from care practices.

The limitations of the study are the limited number of primary scientific articles published on the knowledge of nursing professionals on the subject; the inclusion of studies only in the Portuguese, English and Spanish languages, not covering research published in other languages, as well as not having used dissertations and theses in the discussion of the results. Thus, new primary studies should be conducted, aiming to understand, in a broader way, the knowledge and adherence of nursing professionals working in hemodialysis services, about measures to contain biological risks.

Conclusion

Nursing professionals have knowledge about biosafety measures and recognize the need for their application as an effective instrument in the performance of their work activities in hemodialysis environments, adopting and recommending their use. However, despite knowing the need for biosafety in these care environments, there are gaps in knowledge between discourse and care practice.

Thus, it was evidenced that, among the biosafety practices most implemented by nursing professionals in hemodialysis services, we can mention the hygiene of the hands with soap and water, the correct disposal of sharp objects and the use of PPE, being more frequent the isolated use of the protective mask and procedure gloves.

Moreover, the main barriers to the non-follow-up of professionals to biosafety measures, among which stood out: the time of work in the service and/or sector, excessive self-confidence, professional experience and resistance of professionals regarding the correct use of PPE.

Thus, for the promotion and empowerment of nursing professionals regarding biosafety measures, health institutions that work in performing renal replacement treatment, hemodialysis, should promote the development of educational strategies that relate these measures to the need for a qualified follow-up, in order to favor the clarification of the main questions of the professionals for better development of preventive methods and incentive to the promotion of their specific knowledge.

This research evidenced that the theme of biosafety, although reported in studies, has a reduced amplitude, and should be constantly discussed and worked with nursing professionals working on hemodialysis. In addition, it is emphasized the need for greater engagement of managers of health institutions in the implementation, maintenance and education, aiming to promote better working conditions for the promotion of safety, with a view to eliminating and/or mitigating risks in labor activities.

The accomplishment of this study allowed understanding the level of knowledge of nursing professionals working on hemodialysis about biosafety measures as a preventive method of biological accidents in the work environments. These aspects, which may favor the development of professional improvement measures, to minimize occupational risks and rationale nursing practice.

Collaborations:

1 – conception, design, analysis and interpretation of data: Gilberto dos Santos Dias de Souza, Hercules Pereira Coelho and Aline Morais Venancio de Alencar;

2 – writing of the article and relevant critical review of the intellectual content: Gilberto dos Santos Dias de Souza, Hercules Pereira Coelho, Janayle Kéllen Duarte de Sales, Halana Cecília Vieira Pereira, Ana Maria Machado Borges and Aline Morais Venancio de Alencar;

3 – final approval of the version to be published: Gilberto dos Santos Dias de Souza, Hercules Pereira Coelho, Janayle Kéllen Duarte de Sales, Halana Cecília Vieira Pereira, Ana Maria Machado Borges and Aline Morais Venancio de Alencar.

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