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NURSING CARE FOR PATIENTS WITH GRAFT-VERSUS-HOST DISEASE
CUIDADOS DE ENFERMAGEM A PACIENTES COM DOENÇA DO ENXERTO CONTRA HOSPEDEIROATENCIÓN DE ENFERMERÍA PARA PACIENTES CON ENFERMEDAD DEL INJERTO CONTRA EL HUÉSPED

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ABSTRACT

Objective*:** to analyze the available evidence on nursing care following hematopoietic stem cell transplantation to patients with graft-versus-host disease. ***Method*:** an integrative review of primary studies was conducted in six databases and one virtual health library. A broad search strategy was used, and studies published in English, Portuguese, or Spanish, between 2014 and 2018 were included. The review sample consisted of eight primary studies. ***Results*:** the studies were grouped into three categories to organize the synthesis of knowledge: Nursing process (n = 4), Transplant impact (n = 2), and Technologies for care (n = 2). ***Conclusion: the studies address nursing care in an integrated way with health care to other complications, not specifically addressing graft disease. Issues discussed in the studies included the use of nursing care systematization, the costs of the treatment, the nursing team's dimensioning, and the use of technologies for carrying out the health care. The evidence generated is incipient and points to the need for further studies in the area.

Descriptors: Hematopoietic Stem Cell Transplantation; Bone Marrow Transplantation; Graft vs Host Disease; Nursing Care; Review; Nursing Research.

RESUMO

Objetivo*:** analisar as evidências disponíveis sobre os cuidados de enfermagem realizados a pacientes em pós-transplante de células-tronco hematopoiéticas com doença do enxerto contra hospedeiro. ***Método*:** revisão integrativa, cuja busca de estudos primários ocorreu em seis bases de dados da área da saúde e uma biblioteca virtual em saúde. Utilizou-se da estratégia de busca ampla e incluíram-se as pesquisas publicadas em inglês, português ou espanhol, entre 2014 e 2018. Assim, a amostra da revisão foi composta por oito estudos primários. ***Resultados*:** para organizar a síntese de conhecimento, os estudos foram agrupados em três categorias: Processo de enfermagem (n=4), Impacto do transplante (n=2) e Tecnologias para o cuidado (n=2). ***Conclusão: os estudos abordam o cuidado de enfermagem de forma integrada a outras complicações, não abordando a doença do

enxerto especificamente. Pontuaram-se o uso da sistematização da assistência de enfermagem, os custos com o tratamento, o dimensionamento da equipe de enfermagem e o uso de tecnologias como estratégias para realização do cuidado. As evidências geradas são incipientes e apontam para necessidade do desenvolvimento de mais estudos na área.

***Descritores*:** Transplante de Células-Tronco Hematopoéticas; Transplante de Medula Óssea; Doença Enxerto-Hospedeiro; Cuidados de Enfermagem; Revisão; Pesquisa em Enfermagem.

RESÚMEN

Objetivo: analizar la evidencia disponible sobre los cuidados de enfermería que se brindan a los pacientes en el postrasplante de células madre hematopoyéticas con enfermedad de injerto contra huésped. **Método:** revisión integradora, cuya búsqueda de estudios primarios se realizó en seis bases de datos de salud y una biblioteca virtual de salud. Se utilizó la estrategia de búsqueda amplia y se incluyó la investigación publicada en inglés, portugués o español entre 2014 y 2018. Así, la muestra de revisión estuvo formada por ocho estudios primarios. **Resultados:** para organizar la síntesis de conocimientos, los estudios se agruparon en tres categorías: Proceso de enfermería (n = 4), Impacto del trasplante (n = 2) y Tecnologías para el cuidado (n = 2). **Conclusión:** los estudios abordan el cuidado de enfermería de manera integrada con otras complicaciones, sin abordar específicamente la enfermedad del injerto. Se puntuó el uso de la sistematización del cuidado de enfermería, los costos del tratamiento, el dimensionamiento del equipo de enfermería y el uso de tecnologías como estrategias para la realización del cuidado. La evidencia generada es incipiente y apunta a la necesidad de realizar más estudios en el área.

Descriptores: Trasplante de Células Madre Hematopoyéticas; Trasplante de Médula Ósea; Enfermedad Injerto contra Huésped; Atención de Enfermería; Revisión; Investigación en Enfermería.

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INTRODUCTION

Hematopoietic Stem Cell Transplantation (HSCT) is a therapy for treating malignant and non-malignant diseases that affect the functioning of the bone marrow. According to the source of the stem cells, there are two modalities of transplantation: autologous and allogeneic. The autologous modality is when the cells are derived from the receptor himself, and the allogeneic is when the cells come from a healthy donor, who can be related to the patient or not. For HSCT to happen, preparation called conditioning is necessary, which considers the modality of transplantation and consists in varying the doses of chemotherapeutic agents in addition to considering the source of donor cells (peripheral blood or bone marrow), the degree of compatibility of the Human Leukocyte Antigen (HLA), and the underlying disease among other factors.[1-2]

Complications related to HSCT are due to histocompatibility between the recipient and the donor. The greater the degree of HLA incompatibility, the greater the risk of rejection, late or incomplete graft development, and graft-versus-host disease (GVHD). The gender difference between donor and recipient, the conditioning regime, and the source of stem cells also increase GVHD incidence, which can be acute or chronic. GVHD is one of the main complications of HSCT, affecting approximately 50% to 80% of patients. The disease is mediated by graft T lymphocytes, which attack the recipient's organs and tissues.[2-3]

Some organs can be affected in acute GVHD, such as skin, liver, and gastrointestinal tract. On the other hand, chronic GVHD is a major late cause of allogeneic HSCT morbidity and mortality, and its clinical manifestations can be restricted to a single organ or disseminated, with a profound impact on quality of life since pathophysiology involves inflammation, cellular immunity and humoral and fibrosis.[2-3]

GVHD is complex and can be stressful for the patient, the family member, and the health team since it has an impact on the patient's life routine, deteriorating the patient's quality of life, both in physical, social, and emotional aspects.

Due to this complication's consequences, the entire multidisciplinary team must be attentive to signs and symptoms to optimize detection and ensure early treatment and supportive therapy.[4]

In this context, the nurse's role stands out, since this professional is in close contact with the patient throughout the pre, trans, and post-HSCT. In this way, the nurse is the person who can first identify the signs and symptoms of GVHD, acting in managerial, assistance and education actions with the patient and family, focusing on restoring health.[5]

Given the above, there is a lack of nursing studies in HSCT and GVHD and a reduced knowledge of professionals about the necessary nursing care actions for these patients. This study was developed because we recognize the importance of nursing care for the recovery and improvement of the quality of life of patients with GVHD, as well as the need to spread the care actions evidenced in the literature to these patients.

OBJECTIVE

To analyze the available evidence on nursing care following hematopoietic stem cell transplantation to patients with graft-versus-host disease.

METHOD

This bibliographic, descriptive, and integrative literature review study presents the identification and analysis of scientific articles on nursing care for post-HSCT patients with GVHD. This type of study comprises five stages: elaboration of the research question, search of primary studies in the literature, evaluation of primary studies, data analysis, and presentation of the review.[6]

The acronym PICO (*patient*, intervention, comparison, and outcomes) was used to establish the research question and support the search for primary studies. The following guiding question emerged: what nursing care is provided to patients undergoing hematopoietic stem cell transplantation with graft-versus-host disease?

The first element (P = patient) consisted of patients undergoing HSCT (of any age) with GVHD and the second (I = intervention) is the nursing care. The elements C (comparison between intervention and group) and O (outcomes) were not used due to the type of review.

The searches were carried out in the second half of 2019 using the advanced search form in six databases and one health library: PubMed of the National Library of Medicine (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, Scopus, MEDLINE, Cochrane library, and at the Brazilian Virtual Health Library in Nursing (VHL).

To search was conducted in the databases mentioned above using terms indexed in the Health Sciences Descriptors of the Latin American and Caribbean Center on Health Sciences

Information (DeCS/BIREME in Portuguese), and in the Medical Subject Headings (MeSH/PubMed), according to each database, in addition to the entry terms to ensure broad search. Such descriptors were associated with the acronym PICO, developed for the search strategy, and combined by the Boolean operators AND and OR. A librarian assisted in the process of building the search strategies.

The criteria established for including studies were: primary studies that addressed nursing care to post-HSCT patients with GVHD, available for free, published between 2014 and 2018, and writted in Portuguese, English, or Spanish. Only the PubMed database was used to filter nursing journals since the total result made handling impossible.

For each database, a search strategy was developed with controlled descriptors and keywords. The strategy that served as the basis for searching the different databases was: ("Primary nursing" OR "Nursing care" OR "Delivery of health care" OR "Primary care nursing") AND ("Hematopoietic Stem Cell Transplantation" OR "Stem Cell Transplantation, Hematopoietic" OR "Transplantation, Hematopoietic Stem Cell" OR "Bone Marrow Transplantation" OR "Grafting, Bone Marrow" OR "Bone Marrow Grafting" OR "Transplantation, Bone Marrow" OR "Bone Marrow Cell Transplantation" OR "Transplantation, Bone Marrow Cell" OR "Peripheral Blood Stem Cell Transplantation" OR "Peripheral Stem Cell Transplantation" OR "Stem Cell Transplantation, Peripheral" OR "Transplantation, Peripheral Stem Cell").

The results from the search strategy used were imported into the reference manager EndNote Web. Folders were created for each database/library, with filters for duplicate studies. Language filtering happened manually, during the reading of the studies, to ensure greater accuracy in the selection and new filtering referring to the studies' duplicity in situations in which the reference manager was unable to recognize it.

The pre-selection of primary studies was carried out by reading the titles and abstracts, with subsequent reading of full-text articles. Two reviewers carried out both steps independently, and disagreements were resolved by a third reviewer with experience in the HSCT area. Studies whose inclusion criteria were not evident through titles and abstracts reading were selected for a full-text reading. The study selection process is described in Figure 1.

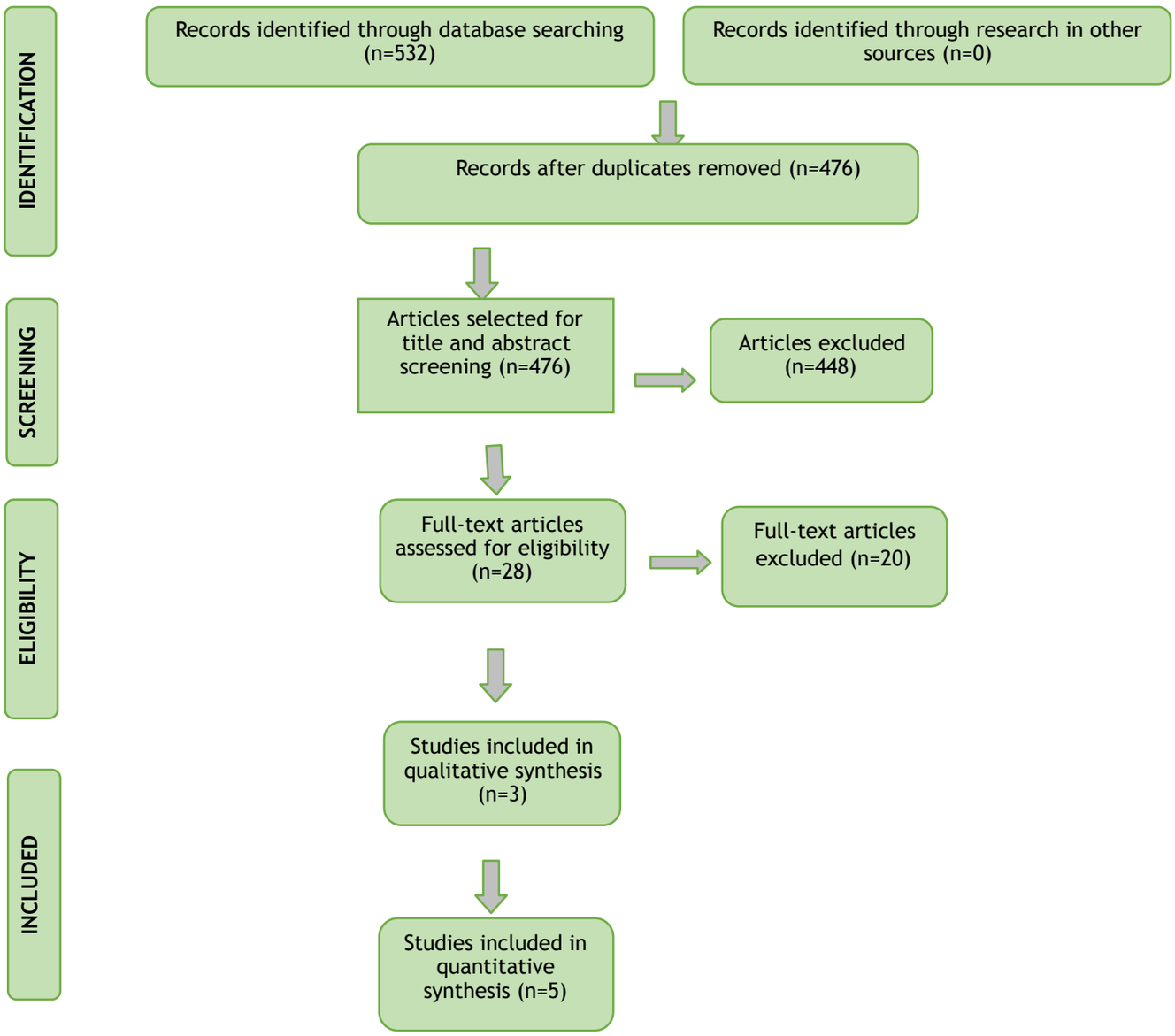

Figure 1. Flow diagram of studies adapted from Preferred Reporting Items for Systematic Reviews and Meta-Analyzes (PRISMA 2009). Curitiba (PR), Brazil, 2020.

The analysis of the data extracted from the studies was carried out descriptively. For each primary article included, a summary table adapted from a Brazilian study was used for data extraction,[7] which made it possible to record information on research identification, such as year of publication, journal's name, country in which the study took place, level of evidence, methodological characteristics, and study objectives. In this way, it was possible to compare the differences and similarities between the studies and to organize the data grouping the articles into categories.

We applied the Critical Appraisal Skill Programme (CASP) and the Agency for Healthcare and Research and Quality (AHRQ) instruments during the methodological analysis of the included

primary studies. For each item evaluated, a value of 0 (zero) or 1 (one) was assigned and the final result (sum of the scores) was obtained, whose maximum score is ten. The selected articles were classified according to the scores: from 6 to 10 points (good methodological quality and reduced bias) or, at least, 5 points (satisfactory methodological quality with increased risk of bias).[8] Of these, only those with a good methodological quality and reduced bias were selected.

Regarding the level of evidence, the AHRQ classifies studies into six levels: 1 - meta-analysis of multiple controlled studies; 2 - individual studies with experimental design; 3 - studies with an experimental design without randomization, with a single group, and pre- and post-test studies; 4 - studies with non-experimental design such as descriptive correlational and qualitative research or case studies; 5 - case reports or data obtained systematically, of verifiable evaluation data; and 6 - opinions of respectable authorities based on clinical competence or opinions of expert committees, including interpretations not based on research. For classification in levels of evidence, the type of study described by the authors of the studies was followed using a nursing research framework for situations in which the type of study was not mentioned.[9]

RESULTS

The search resulted in 532 articles in the following databases: 117 in VHL, 59 in PubMed, 15 in Web of Science, 25 in CINAHL, 271 in SCOPUS, six in Cochrane Library, and 39 in MEDLINE. After applying the inclusion criteria, the sample of this review was composed of eight studies. Of these, five were indexed in national journals, seven of which were published in nursing journals and one in a medical journal. As for the year of publication, the selected studies were published in 2014 (n = 1), 2015 (n = 2), 2016 (n = 1), 2017 (n = 1), and 2018 (n = 3).

Regarding the methodological approach, five studies were quantitative and three qualitative. As for the language, three were written in English and five in Portuguese (but were also available in English).

Of the first authors of the studies, seven were nurses and one was a physician. Regarding the academic degrees, one of the authors had a doctorate degree, three had a master's degree, and four were linked to a *lato sensu* graduate program.

To assist in the organization of the findings extracted from the studies, these were grouped into the following categories, according to the studies' central focus: (1) Nursing process (n = 4), in which the authors mentioned nursing diagnoses and interventions common to the daily post-transplant routine, in a different perspective of needs; (2) Impact of transplantation (n = 2), which included studies on sizing/workload and hospital cost, impacting the safety and quality of care; and

(3) Technology for care (n = 2), which included studies that used health strategies and technology to improve and facilitate the process of identifying possible complications in the post-transplant.

Figure 2 shows the distribution of primary studies after complete reading and categorization concerning authors, year of publication, journal's name, country, evidence level, study type, and study objective.

Authors	Year	Journal's name	Country	Evidence level	Study type	Objective
Lima, Bernardino[10]	2014	Texto e Contexto Enfermagem	Brazil	4	Descriptive, qualitative	To identify care activities for nurses in an HSCT unit.
Araujo, Rodrigues, Oliveira, Silva, Vecchia, Silveira[11]	2015	Cogitare Enfermagem	Brazil	4	Descriptive-exploratory, quantitative	To check the main diagnoses and nursing interventions for patients with GVHD.
Rodrigues, Lacerda, Gomes, Paes, Ribeiro, Mercês[4]	2018	Revista Cuidado é fundamental	Brazil	4	Cross-sectional retrospective	To propose outpatient nursing care that supports the treatment of children in post-HSCT.
Mendes, Ranzani, Marchi, Silva, Filho, Alves, et al.[12]	2016	Medicine	Brazil	3	Quasi-experimental	To evaluate the impact of the chlorhexidine bath on colonization and infection by multi-resistant bacteria in the HSCT ward.
Silva, Póvoa, Lima, Oliveira, Padilha, Secoli[13]	2015	Revista da Escola de Enfermagem da USP	Brazil	4	Prospective cohort	To measure the nursing workload required by patients undergoing HSCT.
Marques, Barbosa, Schultz, Silva[14]	2018	Revista enfermagem UFPE on line	Brazil	4	Evaluative, quantitative, and retrospective	To analyze the cost-minimization of allogeneic HSCT before and after the implementation of the nursing care systematization.
Busby, Campbell, Cole, DeVries, Dobbins, Trimble, et al.[15]	2017	The Clinical Journal of Oncology	United States	4	Qualitative, exploratory	To improve the detection and management of chronic GVHD in post-transplanted patients.
Vaughn, Jonassaint, Goeckerman, Shaw, Shah[16]	2018	Journal of Pediatric Nursing	United States	4	Qualitative, exploratory	To obtain information from patients, caregivers, and clinicians with knowledge on post-HSCT symptoms in children and incorporate this feedback into the design and development of a specific application for this audience.

Figure 2. Authors, years of publication, journals' names, countries, levels of evidence, study types, and study objectives. Curitiba (PR), Brazil, 2020.

DISCUSSION

Primary studies were available in English, possibly to meet the scientific market's demands, as English is the universal language. The most used methodological approach was quantitative, probably associated with the current rise in this type of approach due to its measurable character.

The results showed a progressive increase in the number of studies related to HSCT, as there was a greater concentration of studies published in 2018 (n = 3). This data follows the evolution of therapy since this procedure has been increasingly indicated to patients.

Most of the primary studies were authored by nurses, which shows concern with subsidizing daily practice and producing scientific knowledge. It is noteworthy that the development and access to the literature in the area corroborates to safe and high-quality care. It is also worth mentioning that research aimed at nursing practice proposes to fill the knowledge gaps to generate high-quality care for patients.[17]

The identified health care actions were divided into three categories from the reading and data extraction from the primary studies, which will be discussed below. It is emphasized that, for most studies, the focus was not only on patients with GVHD but also on patients with other associated complications.

Nursing Process

Four studies (n = 4) were included in this category.[4,10-11-12] Care for patients with GVHD requires nursing to develop skills and strategies to use them in the care process, such as technical and scientific knowledge about HSCT and its complications, problem-solving, systematization of nursing care, and health education for patients and families, for example.

Two of the studies in this category addressed the primary Nursing Diagnoses (ND), listed from the daily routine of patient care in post-GVHD transplant.[4.10]

The ND based on the North American Nursing Diagnosis Association (NANDA) taxonomy mentioned in these studies were: "risk of infection", "risk for falls", "risk for impaired liver function", "risk for bleeding", "risk for unbalanced fluid volume", "risk for impaired cardiovascular function"," risk for impaired skin integrity", "diarrhea", "fatigue", "impaired skin integrity", "imbalanced nutrition", "nausea", "impaired swallowing", "impaired oral mucosa", "acute pain", "hyperthermia", "anxiety", "impaired comfort", "deficient fluid volume", "abdominal pain", "ineffective protection", and "impaired home maintenance".[4,10]

Such studies[4,10] pointed out that the most common ND in patients undergoing HSCT is "risk of infection", which can be defined as susceptibility to invasion and multiplication of pathogenic organisms that can compromise health. This is justified by the profile of the patients, who are vulnerable to infections in the face of compromised immune systems.

The risk factors for HSCT-related infections, which can be mentioned, are skin integrity changes, integrity of the oral mucosa, and peristalsis. Associated conditions can be decreased hemoglobin, immunosuppression, leukopenia, invasive procedure, and suppressed inflammatory response. The

early identification of this sign and the institution of early treatment corroborate the improvement in patients' survival.[4,18]

Another risk factor that can be evidenced in patients undergoing HSCT and which increases the risk of infection is the use of immunosuppressants, such as cyclosporine, which is very common in the post-HSCT routine. Such medication is used to prevent graft rejection being useful as a prophylaxis for GVHD.

Another risk factor for infection that can be mentioned is the Central Venous Catheter (CVC), widely used by these patients. In the pre-transplant phase, right after admission, the patient is submitted to CVC implantation, which must remain permeable throughout the treatment, requiring a trained nursing team to handle it – an inherent factor for the success of HSCT.[4,18]

To prevent infection, careful care related to the insertion and maintenance of the catheter is necessary. The nurse, the only health professional to handle the device, is responsible for acquiring technical and scientific knowledge and developing technical skills favoring safe care and avoiding complications that may result in the early removal of the device or even endanger the patient's life.

The presence of GVHD is also a factor that interferes with immunity. As mentioned, the main organs affected are skin (skin rash, erythroderma, and scaling), liver (hepatitis and jaundice), and gastrointestinal tract (abdominal pain, nausea, diarrhea, and intestinal bleeding).[3-4] After the appearance of these symptoms, treatment with corticosteroids should be started. Thus, there is an increase in this patient's immunosuppression favoring bacterial, viral, and fungal infections.

The four articles included in this category pointed out specific nursing care for these patients with a risk of infection from the primary studies. One of them[11] used the Nursing Interventions Classification (NIC) to define nursing activities for the patients, while the others reported general nursing care.[4,10-12]

The most indicated nursing care actions for patients undergoing HSCT is the control of vital signs, possibly due to the higher risk of infection. One of the first signs/symptoms is hyperthermia. It is pointed out that the impairment of the immune system, which occurs in these patients, favors the rapid evolution of the condition to sepsis; therefore, the nurse must be aware of any changes in vital signs adopting immediate intervention strategies.

When dealing specifically with GVHD, the nursing care indicated by the studies included in this category is detailed in Figure 3, categorized according to the affected organ: skin, gastrointestinal tract, and liver. The results presented are considered low-cost and easy-to-apply interventions. Besides, many care actions involve guidance to the patient and caregiver with health education inherent to nurses' practice in the HSCT context.

Physical Evaluation / Organ	**Nursing care actions**
Skin evaluation	Assess the presence and evolution of skin rash; monitor the use of prescribed topical corticosteroids; guide patient to avoid exposing his skin to the sun and on the daily use of sunscreen; avoid hot baths/keep skin hydrated; offer oil with essential fatty acids to the patient; change dressings and place the venous catheter; wear cotton clothes; use neutral soaps; provide guidance on environment control and body cleanliness.
Gastrointestinal tract evaluation	Evaluate oral mucosa; advise on oral hygiene; provide and advise on the use of mouthwash; record and evaluate food and water patterns (acceptance, type of food, and frequency); body weighing; evaluate the physiological eliminations; request the evaluation and monitoring of a nutritionist; assess/discuss the need for more complex nutrition; assess nausea, vomiting, and diarrhea; monitor signs of dehydration; guide the use of daily chlorhexidine; control of water balance.
Liver evaluation	Evaluate and control laboratory tests; assess liver function.

Figure 3 - Distribution of nursing care actions indicated in the studies included in the category Nursing Process, according to the organ affected by GVHD. Curitiba (PR), Brazil, 2020.

In these same studies, other precautions were mentioned including physical evaluation; infection prevention; fall prevention; energy control; anxiety reduction; relaxation therapies; self-care assistance; nutritional therapy; environmental care; drug therapy; and diarrhea control.[4,10,11]

Among the care actions cited to encourage self-care, there is guidance on hygiene procedures, [4.10-11] and a primary study[12] pointed out that the daily use of 2% chlorhexidine during the bath significantly reduces colonization rates and infection by vancomycin-resistant enterococcus (VRE) in the transplant unit, mainly due to the frequent use of vancomycin and recurrent lesions in the gastrointestinal tract, such as GVHD and mucositis. Given the immunosuppression caused by the treatment of GVHD, such a study can contribute to the prevention of infection based on the indication of preventive measures.

The results corroborate the importance of nursing systematization for patients undergoing HSCT and, especially, for those with GVHD as they require differentiated care due to the multiplicity of needs and physical and emotional losses caused by this complication. In this context, nurses need to plan their actions to meet patients' individual demands at all stages of treatment.

Impact of Hematopoietic Stem Cell Transplantation

Two studies were included in this category (n = 2) addressing, especially, the impact of GVHD in post-HSCT patients.[13-14] The nursing care performed at HSCT becomes more expensive in the face of complications, such as GVHD. Therefore, it is necessary to adequately dimension the nursing team to guarantee safe and quality care for this patient profile. It should be noted that, although the

studies included in this category have also pointed out nursing care, the central focus was on the impact of HSCT, being included in the second category and not in the first.

One of the studies[13] presents the Nursing Activities Score (NAS) instrument, which measures the nursing workload. It is pointed out that patients undergoing HSCT demand a workload similar to that of the Intensive Care Unit (ICU) since the workload recorded in the study for the first public is 16.7 hours of assistance, and for the second, 17.9 hours, according to Resolution 543/2017, of the Brazilian Federal Nursing Council (COFEN in Portuguese).[19]

The symptoms associated with GVHD including diarrhea, asthenia, dysphagia, abdominal pain, and body itching are important for the increased workload, as they require more hours of nursing care.

It should be noted that in bowel GVHD, the volume of diarrhea, which must be measured by nursing, allows the complication to be classified in four degrees, according to the involvement of the intestinal tract: stage 1 - diarrhea from 500ml to 1000ml / 24h; children 10–19.9 ml / kg / day; stage 2 - diarrhea from 1000 to 1500ml / 24h; children 20–30 ml / kg / day; stage 3 - diarrhea from 1500 to 2000ml / 24h; children> 30 ml / kg / day; and stage 4 - diarrhea> 2000ml or abdominal pain or ileus.[20]

Still, patients with GVHD, due to weight loss, abdominal pain, and inadequate food intake, may have the nursing diagnosis Imbalanced nutrition: less than body requirements. In many situations, the institution of Total Parenteral Nutrition (TPN) may be necessary to replace electrolytes and calories. In this way, nursing care also focuses on the NPT installation and management.

With the progression of diarrhea, patients' complaints increase including progressive fatigue and restriction to the bed, signaling the risk of falling. In this context, the dependence on nursing care for hygiene and comfort becomes more significant. Furthermore, all the elements mentioned above inevitably increase the nursing workload.

In addition to the physical and emotional impact caused by GVHD, hospital costs also rise, as there is an increase in hospital stay, hours of nursing care, and an increase in patient complexity (more aggressive medications, invasive devices that require greater control, and diagnostic tests among others).

One of the articles included[14] deals with how the systematization of nursing care (SNC) affects the cost of HSCT. It is pointed out that the use of SNC results in a decrease in the cost of assistance and the reach of its effectiveness in all stages of HSCT; in other words, SNC has assistance and economic repercussions.

In that same study[14], the impact on labor costs was reduced from 324,406.55 to 305,483.60 and, based on these data, the emergence of protocols such as febrile neutropenia was necessary. The

study also highlights the importance of educating patients and family members to change behaviors generating risk reduction for patients and reducing costs with drugs and tests.

Security in the planning of care, execution and evaluation of nursing conduct, individualized assistance, visibility and autonomy for nurses, reduction of hospitalization time and, consequently, cost reduction, are positive aspects of the SNC application.[21]

Technologies for Care

In the third category, two studies were included (n = 2) that used health technologies,[15-16] and presented strategies for information and support for the benefit of patient care, such as soft-hard and hard technologies, which permeate reception and long-term follow-up after HSCT.

The information and communication technologies applied to the health area provide different resources that, in addition to care management, allow different preventive measures against adverse events. In recent years, systematic programs have been developed to collect and analyze information that underlies planning interventions and the management of care plans.[22]

Nurses can benefit from advances in technology to facilitate patient care. Health care technology has emerged from high-complexity sectors and has been assimilated across the continuum of care, using it to monitor and manage patients not only in highly acute and intensive care settings but also in the long term and in-home care.[23]

One of the articles highlights a telemedicine program for monitoring patients undergoing HSCT, which uses this technology to continue monitoring, even when patients return to their homes. This program uses photos that the patients themselves send to complaint assessment.[15]

In this study, a booklet and a video were created to guide patients on taking a good-quality photograph, which should be sent to the hospital to assess the oral cavity. Besides, oral care was also given to patients with GVHD.[15]

This technology proved to be an alternative to support patients, allowing follow-up outside the hospital environment and providing a first and early assessment if the patient presents any change in the health pattern.

The other study discusses a mobile application prototype aimed at pediatric patients aged 8 to 18 years. The purpose was to monitor the symptoms recorded in a treatment diary and, thus, encourage self-care and assist health professionals in managing symptoms, facilitating the identification of personalized health strategies.[16]

The application presents the main symptoms presented by patients undergoing HSCT, such as skin rash, bleeding, neuropathy, oral cavity issues, monitoring of excreta (emesis, diuresis, and evacuation) and characteristics and quantities in the day, and the patient can establish a score from 1 (poor) to 10 (excellent).[16]

The application also suggests self-care that the patient should develop during the day, such as body and oral hygiene and walking. Such a study is useful for those with GVHD since it shows the most frequent symptoms of HSCT and allows the control of symptoms.[16]

The applications used in the health area must meet patients' demands and be capable of being used by nurses in daily practice. The latter must also ensure that the information contained in these instruments is validated and based on clinical evidence.[24] The use of information and communication technologies favors quality and effective nursing care.[25]

It is observed that the technologies mentioned above, when used effectively and accessible to the population, corroborates the continuity of assistance, even outside the hospital since these patients are monitored via health technology. Some limitations for using technologies are highlighted in the two studies mentioned above, such as the socioeconomic condition of the population, access barriers to technology, and internet availability.

There are few nursing studies on HSCT with only one associating nursing care to post-HSCT patients with GVHD. Besides, the studies found have a low level of evidence, with only one quasi-experimental study (level 3 evidence); the others were classified as level 4.

Among the limitations of this study, the selection of primary studies for this review's composition is mentioned, and the gray literature was not included. The restriction of languages and the descriptive analysis of data through the evaluation of studies from different approaches is a complex process and can also be considered a limitation.

The evidence raised by this study corroborates the development of nursing practice for patients in post-HSCT with GVHD and points out gaps such as the lack of studies to support nurses' work scientifically.

CONCLUSION

The nursing care provided to patients in post-HSCT with GVHD described in the literature comprise the use of SNC, specifically the nursing process, in assisting these patients by establishing the most common nursing diagnoses and interventions such as "Risk of infection".

The impact of HSCT for these patients due to possible complications and risk of life, and repercussions for the nursing team given the demand for health care were also investigated.

The increase in costs caused by complications, including GVHD, was also pointed out, as well as the use of technologies that corroborate the educational process of preventing events and monitoring these patients.

It is noteworthy that the synthesis of the studies included in this review contributes to supporting nursing actions for patients in post-HSCT with GVHD, both at the organizational level,

considering the dimensioning of the nursing team, and in clinical practice, since the studies found point to the relevance of hospital care and implementation of SNC.

GVHD is a complication that interferes with various aspects of the patient's life, with impact on physical, emotional, and quality of life issues. For this reason, nursing care for patients in post-HSCT with GVHD contribute to early treatment and improvement of quality of life. With a comprehensive and technical-scientific view, the performance of nursing allows biopsychosocial management, encompassing the individuality of the patient and the spheres affected by the disease.

In conclusion, this study was intended to encourage the discussion about nursing care performed for patients in post-HSCT with GVHD, pointing out knowledge gaps and encouraging the development of studies in the area to enhance the quality of care.

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