Literature Review

TEXTO & CONTEXTO ENFERMAGEM
TEXT & CONTEXT NURSING TEXTO & CONTEXTO ENFERMERÍA

EDUCATIONAL TECHNOLOGIES USED TO TEACH SELF-MANAGEMENT AFTER HEMATOPOIETIC STEM CELL TRANSPLANTATION: A SCOPING REVIEW

Anália Andréia de Araújo Nascimento[1]
Valéria Dantas de Azevedo[1]
Anaclécia Ferreira da Silva[2]
Mayara Leal Godinho[2]
Quenia Camille Soares Martins[1]
Viviane Euzébia Pereira Santos[1]
Marcos Antonio Ferreira Júnior[3]
Isabelle Campos de Azevedo[1]

[1]Universidade Federal do Rio Grande do Norte, Programa de Pós-Graduação em Enfermagem. Natal, Rio Grande do Norte, Brasil.
[2]Universidade Federal do Rio Grande do Norte, Departamento de Enfermagem. Natal, Rio Grande do Norte, Brasil.
[3]Universidade Federal de Mato Grosso do Sul, Programa de Pós-Graduação em Enfermagem. Natal, Rio Grande do Norte, Brasil.

ABSTRACT

Objective: to map the scientific evidence on the educational technologies used to teach self-management in hematopoietic stem cell post-transplantation.
Method: a scoping review, based on JBI recommendations. The searches took place between January and February 2022, in databases and repositories of dissertations and theses. The PCC strategy was used, namely: P (Population) – patients (patient participation); C (Concept) – educational technologies and self-management (instructional technology, self-management); and C (Context) – post hematopoietic stem cell transplantation (bone marrow transplantation). Studies that discussed the educational technologies used to teach self-management after hematopoietic stem cell transplantation, available in full electronically, were included. Editorials, letters to the editor and opinion articles were excluded. Duplicate studies were considered only once. The data are presented in figures and chart format.
Results: sixteen studies were selected to compose the final sample, most of which showed that the most used educational technologies in the context of hospital discharge after hematopoietic stem cell transplantation are websites, software, movies, online videos or not, care plans, posters, books and booklets aimed at teaching.
Conclusion: the use of educational technologies in teaching and patient health education is a reality present in services at any level of health care. The highlight of the approach to this topic is anchored in how these technologies are used and whether they are properly defined for each patient, according to the results of this study.

DESCRIPTORS: Self-management. Educational Technology. Hematopoietic Stem Cell Transplantation. Patient discharge summaries. Nursing care. Competency-based education. Health education.

HOW CITED: Nascimento AAA, Azevedo VD, Silva AF, Godinho ML, Martins QCS, Santos VEP, Ferreira Junior MA, Azevedo IC. Educational technologies used to teach self-management after hematopoietic stem cell transplantation: a scoping review. Texto Contexto Enferm [Internet]. 2023 [cited YEAR MONTH DAY]; 32:e20220170. Available from: https://doi.org/10.1590/1980-265X-TCE-2022-0170en

TECNOLOGIAS EDUCACIONAIS UTILIZADAS PARA O ENSINO DA AUTOGESTÃO NO PÓS-TRANSPLANTE DE CÉLULAS-TRONCO HEMATOPOÉTICAS: *SCOPING REVIEW*

RESUMO

Objetivo: mapear as evidências científicas sobre as tecnologias educacionais utilizadas para o ensino da autogestão no pós-transplante de células-tronco hematopoéticas.
Método: *scoping review*, apoiada nas recomendações do JBI. As buscas ocorreram entre janeiro e fevereiro de 2022, em bases de dados e repositórios de dissertações e teses. Utilizou-se a estratégia PCC, a saber: P (População) – pacientes (participação do paciente); C (Conceito) – tecnologias educacionais e autogestão (tecnologia instrucional, autogerenciamento); e C (Contexto) – pós-transplante de células-tronco (transplante de medula óssea). Foram incluídos estudos que discutissem sobre as tecnologias educacionais utilizadas para o ensino da autogestão no pós-transplante de células-tronco hematopoéticas, disponíveis na íntegra em meio eletrônico. Foram excluídos editoriais, cartas ao editor e artigos de opinião. Os estudos duplicados foram considerados apenas uma vez. Os dados estão apresentados em formato de figuras e quadro.
Resultados: foram selecionados 16 estudos para compor a amostra final, dentre os quais, em sua maioria, evidenciaram que as tecnologias educacionais mais utilizadas no contexto de alta hospitalar no pós-transplante de células tronco-hematopoéticas são *websites*, *softwares*, filmes, vídeos *online* ou não, planos de cuidado, cartazes, livros e cartilhas voltados para o ensino.
Conclusão: o uso das tecnologias educacionais no ensino e na educação em saúde dos pacientes é uma realidade presente nos serviços em qualquer um dos níveis de atenção à saúde. O ponto de destaque da abordagem a este tema se ancora em como essas tecnologias são utilizadas e se são definidas de forma adequada para cada paciente, conforme resultados deste estudo.

DESCRITORES: Autogestão. Tecnologia educacional. Transplante de células-tronco hematopoéticas. Sumários de Alta do paciente hospitalar. Cuidados de enfermagem. Educação baseada em competências. Educação em saúde.

TECNOLOGÍAS EDUCATIVAS UTILIZADAS PARA ENSEÑAR EL AUTOCUIDADO DESPUÉS DEL TRASPLANTE DE CÉLULAS MADRE HEMATOPOYÉTICAS: REVISIÓN DE ALCANCE

RESUMEN

Objetivo: mapear la evidencia científica sobre las tecnologías educativas utilizadas para enseñar el automanejo en el postrasplante de células madre hematopoyéticas.
Método: revisión de alcance, basado en las recomendaciones del JBI. Las búsquedas se realizaron entre enero y febrero de 2022, en bases de datos y repositorios de disertaciones y tesis. Se utilizó la estrategia PCC, a saber: P (Población) – pacientes (participación de los pacientes); C (Concepto) – tecnologías educativas y autogestión (tecnología instruccional, autogestión); y C (Contexto): postrasplante de células madre hematopoyéticas (trasplante de médula ósea). Se incluyeron estudios que discutieron las tecnologías educativas utilizadas para enseñar el autocuidado después del trasplante de células madre hematopoyéticas, disponibles en su totalidad electrónicamente. Se excluyeron editoriales, cartas al editor y artículos de opinión. Los estudios duplicados se consideraron una sola vez. Los datos se presentan en formato de tablas y figuras.
Resultados: se seleccionaron 16 estudios para componer la muestra final, la mayoría de los cuales mostró que las tecnologías educativas más utilizadas en el contexto del alta hospitalaria después del trasplante de células madre hematopoyéticas son sitios web, software, películas, videos en línea o no, planes de atención, carteles, libros y folletos destinados a la enseñanza.
Conclusión: el uso de tecnologías educativas en la enseñanza y educación en salud del paciente es una realidad presente en los servicios de cualquier nivel de atención a la salud. Lo más destacado del abordaje de este tema está anclado en cómo se utilizan estas tecnologías y si están bien definidas para cada paciente, según los resultados de este estudio.

DESCRIPTORES: Automanejo. Tecnologia educacional. Trasplante de células madre hematopoyéticas. Resumen del alta del paciente. Atención de enfermería. Educación basada en competencias. Educación en salud.

INTRODUCTION

The definition of technology refers to scientific knowledge applied for practical purposes in any field, which includes methods, techniques and instrumentation. To this end, technological development is part of a context of change and innovation, in response to some specific demand from society[1].

There are different ways of classifying technologies and, among Brazilian health professionals, the most used or widespread classification is that of Merhy, which divides technologies into soft, soft-hard and hard[2]. The aforementioned researcher deals with technology in a broad way, when he considers that the soft ones relate to human and work relationships, such as reception, active listening and professional-patient and patient-patient bond. Soft-hard technologies are related to structured knowledge, such as theories, protocols and lines of care, and hard technologies are the material resources themselves, such as machinery, diagnostic tests, among others[3].

In the field of health, especially nursing, technologies are used in all aspects of division of labor, whether in teaching, research, care or management[4]. With regard to teaching patients in the health area, the use of educational technologies (ET) stands out. This type of technologies are devices used in the mediation of teaching and learning processes, consisting of facilitating instruments, situated between man, the world and education, with the purpose of educating for the elaboration of knowledge that favor the creation and modulation of scientific knowledge. ET are characterized as tools that are strengthened by action and interaction centered on the integral development of man, inserted in the dynamics of social transformation in a permanent effort to renew education[5–6].

ET should not just be seen as a trend; they need to be increasingly linked to health care in daily services[1]. Thus, it is important to reflect on how these technologies are inserted in nurses' practice[6]. Understanding the importance of these tools in the care environment and in society, raises a more complete and complex understanding, when considering the knowledge conveyed by patients' cultural values and their association in the solution of everyday problems, in a way that enables the ability to transform knowledge/doing into health. However, to use an ET, especially in the health area, it is necessary for the health educator/professional to first understand the importance of being a facilitator of the teaching-learning process[1].

In the meantime, nurses stand out for exercising the role of educator when they develop prevention, promotion, protection and health rehabilitation actions based on educational strategies that facilitate meaningful learning in care. For this, they need to know and use coherent concepts, capable of improving care with popular know-how and technical-scientific knowledge[7], as well as using support tools in conducting this process, such as ET.

Thus, planning educational activities for patients is one of the challenges of nursing care. To this end, it is worth emphasizing the use of ET capable of meeting patients' needs, hence the importance of thinking about and defining a valid technology for each individual. According to the literature, there are two ways to classify ET: dependents, when their operation is linked to electronic resources for use (computer, smartphone, tablet, internet); and independent, when they do not use electrical resources for use (poster, booklet, serial album, leaflets, folder, manual, string literature, guide, comics, newspaper, textbook, mural)[1].

The use of ET to mediate health education and guidance during consultations, consultations, hospitalization and hospital discharge proves to be an excellent strategy to achieve and enhance the objectives of teaching patients in the health area, as long as each individual's specificities are respected, such as level of education and access to technologies dependent on electronic resources or the internet.

Faced with the impact of diagnosis and treatment, patients have certain levels of anxiety, especially those with onco-hematological diseases[8], for instance. This fact increases the difficulty to assimilate, in an efficient way, important information verbalized in orientation moments[9]. Therefore, the challenge of educating becomes greater given the complexity of this patient[10].

Among onco-hematological patients, those submitted to hematopoietic stem cell transplantation (HSCT) stand out, considered a widespread therapy for the treatment of leukemias, lymphomas, myelomas, myelodysplastic syndrome, some forms of anemia, autoimmune and metabolic diseases, among others[11]. It is estimated that around 50,000 transplants of this type are performed worldwide each year. In 2021, in Brazil,3,826 patients of different age groups and of both sexes underwent HSCT[12].

HSCT consists of the infusion of hematopoietic stem cells (HSC), which can come from bone marrow, peripheral blood or umbilical cord and placental blood. As for its classification, it concerns the type of donor, when: in autologous transplantation, the cells come from the patients themselves; in allogeneic, HSC were donated by a relative or a volunteer donor from the Brazilian National Registry of Bone Marrow Donors (REDOME - *Registro Nacional de Doadores de Medula* Óssea) with human leukocyte antigen compatibility; and in syngeneic, in which the cells are from an identical twin brother[11–13].

Due to the complexity of treatment and because it requires protective isolation on days of hospitalization, distancing from family, work, daily activities and hobbies, patients tend to be mentally overloaded. In addition, the expected and adverse effects of chemotherapy and other drugs, as well as toxicities, make them very sensitive and exhausted[8]. All these factors, associated with other peculiarities of each individual, hinder the teaching-learning process required in moments of guidance and health education, especially in the post-HSCT period.

In HSCT services, health education is an essential part of nurses' work process, especially to guide care after hospital discharge. The post-transplant adaptation phase requires extreme care that is guided by the team. Therefore, there is a need for patients to be willing to be active subjects to improve their physical, emotional, functional, social and family well-being[10].

In this regard, ET have a notorious relevance in the provision of health care to patients, at all levels of care, especially those of medium and high complexity, which require a greater collection of guidelines and changes in daily habits, in search of improvement in quality of life[10].

The use of ET in raising awareness of self-management on the part of patients in the process of hospital discharge makes it possible to raise new knowledge, and these tools provide access to educational content based on scientific evidence that can favor the practice of attitudes for harm prevention or even the identification of urgent and emergency situations[5]. It is important here to differentiate the concepts of self-care and self-management, which are different but interconnected. Self-care, according to Dorothea Orem, is characterized as self-care, in which individuals carry out actions and strategies to maintain their health and quality of life in appropriate conditions[14–15].

Self-management, considering the context of taking care of oneself, refers to the subset of self-care focused on managing the health-disease process. Moreover, it is associated with a person's ability to manage physical, psycho-socio-emotional and spiritual changes, treatments and potential lifestyle changes. There are self-management programs for patients with chronic diseases that present interventions, through the experiences of other individuals, with a view to developing skills and abilities to self-monitor signs and symptoms and manage decision-making to control health status, such as the Patient Expert Program[16].

Patients submitted to HSCT must practice self-management in all phases of treatment. However, it is in the post-transplant period that such care must be intensified and patients must have the largest possible amount of information to guide them, considering the sudden change in lifestyle required for the therapy to be effective and for achieving a cure or the prospect of greater survival.

Hence the importance of knowing the range of ET options available that can support the moments of guidance and health education that will be decisive for the execution of quality post-HSCT care[17].

Considering the above, the present research can contribute significantly to the scope of HSCT, and its results can support the practice of nurses who work in the area, by allowing to know the main ET used for teaching self-management of patients in the context post-HSCT. Furthermore, it is intended to promote discussions regarding the types of technologies used and identify gaps on this topic.

To this end, the following research question was elaborated: which ET are used to teach self-management after HSCT? The objective was to map scientific evidence on ET used to teach self-management after HSCT.

METHOD

This is a scoping review (ScR), with a protocol registered in the Open Science Framework (OSF) (https://osf.io/q7hbu/). This method allows mapping the main concepts, clarifying areas of research and identifying gaps in knowledge[18–20], as is the case of ET used for teaching self-management in the post-HSCT.

This review was developed based on the PRISMA-ScR[21] recommendations and the method proposed by the JBI[19], which establishes five steps: 1) identification of the research question; 2) identification of relevant studies; 3) selection of studies; 4) data extraction and analysis; and 5) data grouping, synthesis and presentation.

For the first stage, research question identification, the PCC strategy was used, namely: P (Population) – patients undergoing transplantation (of any age and both sexes); C (Concept) – ET and self-management; and C (context) – post-HSCT. Thus, the guiding question elaborated to reach the objective was: which ET are used to teach self-management after HSCT?

As inclusion criteria, research related to ET used for teaching self-management after HSCT with patients of any age and both sexes, fully published in any language, and that were available in full through the remote access of the Federated Academic Community (CAFe - *Comunidade Acadêmica Federada*), through the Journal Portal of the Coordination for the Improvement of Higher Education Personnel (CAPES - *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*) of the Ministry of Education (MEC), were listed. There was no temporal delimitation in order to rescue all possible studies on the subject, as guided by the JBI manual[18–20]. Editorials, letters to the editor, opinion articles were excluded, and duplicate articles were considered only once.

As a way of ensuring that there are no studies with the same theme registered in the OSF or published in available literature, a broad search was carried out on the platform and in databases, to identify protocols or reviews that dealt with a similar subject, and they were not found. Based on this diagnosis, steps were taken to consolidate the ScR.

The second stage was subdivided into two phases: one corresponded to the selection of descriptors in research published and available in the National Library of Medicine (PubMed) and Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases, according to the JBI manual;[18] in the other, the appropriate descriptors were searched in the Medical Subject Heading Terms (MeSH), namely: patients; educational technology; hematopoietic stem cell transplantation; self-management.

Two searches were carried out to select the largest number of studies in PubMed and CINAHL, in order to identify the most used keywords in published studies, applying the following crossings: patients AND educational technology AND hematopoietic stem cell transplantation; and educational technology AND hematopoietic stem cell transplantation AND self-management.

After selecting the descriptors and their synonyms, searches were carried out between January and February 2022 in the following databases and repositories of theses and dissertations, in fulfillment of the third stage: PubMed; Scopus; Web of Science (WoS); Science Direct, CINAHL; Latin American and Caribbean Literature on Health Sciences (LILACS), COCHRANE, The National Library of Australia's Trobe (TROVE), Academic Archive Online (DIVA), CAPES, Education Resources Information Center (ERIC), DART-Europe E-Theses Portal, Electronic Theses Online Service (EThOS), *Repositório Científico de Acesso Aberto de Portugal* (RCAAP), National ETD Portal, Theses Canada, Theses and dissertations from Latin America. The adopted strategy was built using the Boolean operators OR and AND referring to each item of the PCC strategy, as described in Chart 1.

Chart 1 - Definition of search strategies in each database. Natal, RN, Brazil, 2022**.**

Databases/total studies	**Search strategy**
PubMed/64,589 studies	(patients[Title/Abstract]) OR ("patient participation"[Title/Abstract] OR patient[Title/Abstract]) AND ("educational technology"[Title/Abstract]) OR ("technology, educational"[Title/Abstract] OR "educational technologies"[Title/Abstract] OR "technologies, educational"[Title/Abstract] OR "instructional technology"[Title/Abstract] OR "instructional technologies"[Title/Abstract]) AND ("self-management"[Title/Abstract]) OR (selfmanagement[Title/Abstract] OR "management,self"[Title/Abstract]) AND ("hematopoietic stem cell transplantation"[Title/Abstract]) OR ("hematopoietic stem cell"[Title/Abstract] OR "hematopoietic progenitor cells"[Title/Abstract] OR "bone marrow transplantation"[Title/Abstract]).
Web of Science/2,815,244 studies	(((((((TS=((patients))) OR TS=(("patient particicipation" OR patient))) AND TS=(("educational technology"))) OR TS=(("technology, educational" OR "educational technologies" OR "technologies, educational" OR "instructional technology" OR "instructional technologies"))) AND TS=(("self-management"))) OR TS=((selfmanagement OR "management,self"))) AND TS=(("hematopoietic stem cell transplantation"))) OR TS=(("hematopoietic stem cell" OR "hematopoietic progenitor cells" OR "bone marrow transplantation")).
Scopus/234 studies	TITLE-ABS-KEY(patients) OR (patient particicipation OR patient) AND (educational technology) OR (technology, educational OR educational technologies OR technologies, educational OR instructional technology OR instructional technologies) AND (self-management) OR (selfmanagement OR management,self) AND (hematopoietic stem cell transplantation) OR (hematopoietic stem cell OR hematopoietic progenitor cells OR bone marrow transplantation).

Chart 1 - Cont.

Databases/total studies	Search strategy
Science Direct/113,732 studies	(patients[Title/Abstract]) OR (patient particicipation[Title/Abstract]) AND (educational technology[Title/Abstract]) OR (instructional technology[Title/Abstract]) AND (self-management[Title/Abstract]) OR (selfmanagement[Title/Abstract]) AND (hematopoietic stem cell transplantation[Title/Abstract]) OR (bone marrow transplantation[Title/Abstract]).
Cochrane/0 studies; Catalog of Theses and Dissertations (CAPES)/111 studies; Theses and dissertations from Latin America/0 studies	patients AND educational technology AND hematopoietic stem cell transplantation AND self-management.
LILACS/2 studies	#1 – patients AND educational technology AND hematopoietic stem cell transplantation. #2 – educational technology AND hematopoietic stem cell transplantation AND self-management.
National Library of Australia's Trove/17 studies; DART-Europe E-Theses Portal/105,889 studies; Electronic Theses Online Service (EThOS)/1,460 studies	(patients) OR ("patient particicipation" OR patient) AND ("educational technology") OR ("technology, educational" OR "educational technologies" OR "technologies, educational" OR "instructional technology" OR "instructional technologies") AND ("self-management") OR ("selfmanagement" OR "management,self") AND ("hematopoietic stem cell transplantation") OR ("hematopoietic stem cell" OR "hematopoietic progenitor cells" OR "bone marrow transplantation").

The selection stage involved searches in databases in which the studies were identified and had their titles and abstracts read and analyzed by two reviewers, who worked in pairs, to select potential eligible materials. There was no disagreement regarding the inclusion of selected studies.

Subsequently, all included files were read in full by a pair of reviewers independently, with the purpose of answering the research question, achieving the proposed objective, using the inclusion and exclusion criteria. In addition, the reference lists of selected studies were analyzed in order to find important complementary studies that answered the guiding question.

To carry out the fourth stage, data were extracted, using a spreadsheet prepared in Microsoft Excel® 2017, by the authors and organized according to the following variables: identification, author, year of publication, country where the research was carried out, database, study design, sample, ET used for teaching self-management in post-transplantation of HSC and level of evidence. The level of evidence of studies was classified according to the JBI[18], categorized from one (I) to five (V). The doubts raised were resolved by consensus among the authors.

Data on the country where the study was carried out, language and year of publication were analyzed descriptively using simple statistics and presented in figure format, and the other variables are organized in Chart 2 to facilitate visualization and interpretation of results, thus concluding the fifth step.

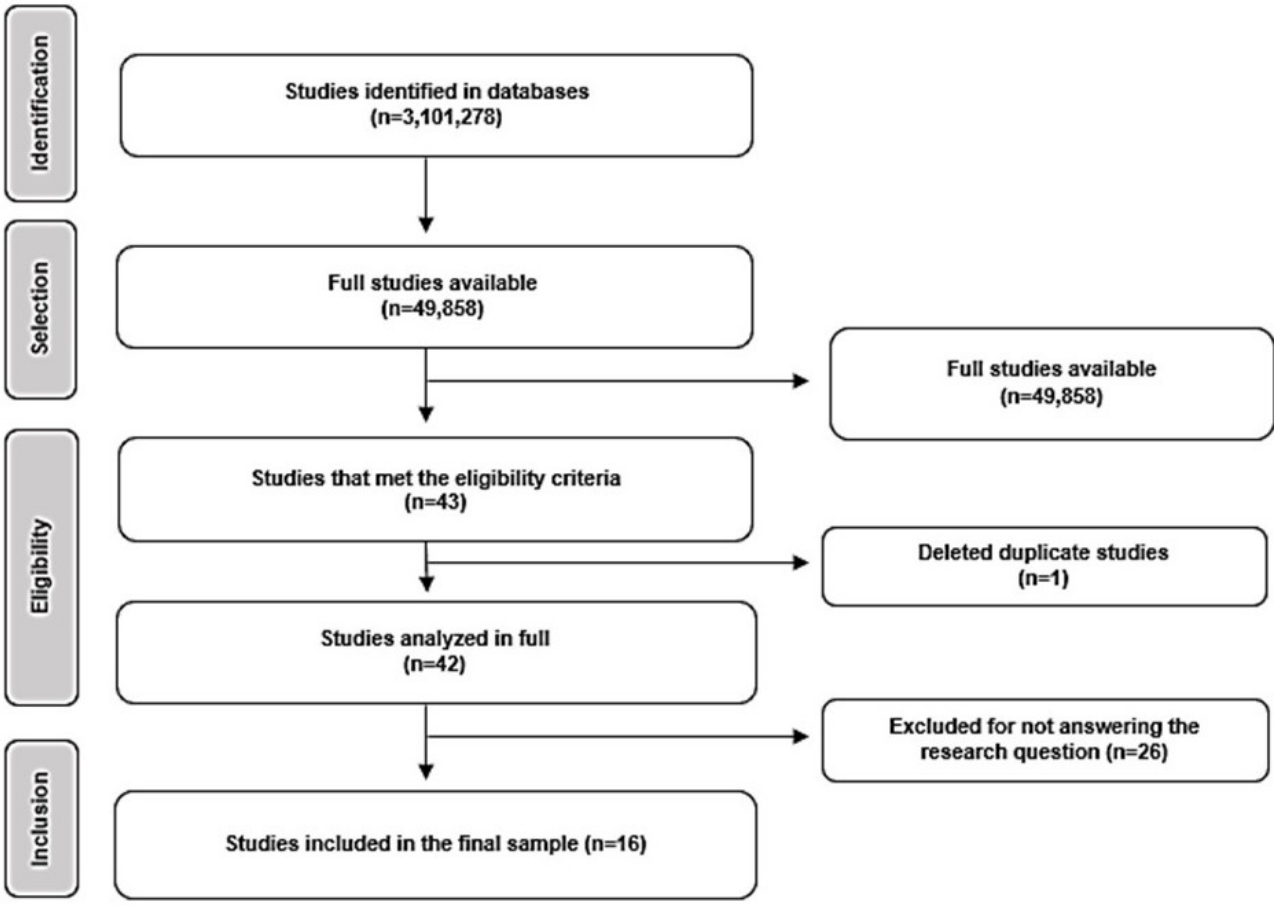
As this is not research with human beings, there was no need for appreciation by an ethics committee. However, it is important to highlight that the copyrights were respected with correct citation and referencing of studies.

RESULTS

The initial search obtained 3,101,278 studies in the databases and repositories of listed dissertations and theses, however,49,858 of these were available in full text format for analysis. After applying the exclusion and inclusion criteria and subsequent reading of the title and abstract, 43 studies were selected for reading.

After removing duplicate files from data sources, a total of 42 studies were read in full. Of these, 26 studies were excluded because they did not answer the study question or were not related to post-HSCT, and 16 were selected to compose the sample because they answered the guiding question and suited the purpose of this research, as shown in Figure 1.

Figure 1- Selection process flowchart. Natal, RN, Brazil, 2022**.**



Among the countries in which the documents were prepared, the United States of America (USA) stands out, with nine (56.2%) publications, followed by Brazil, with four (25%). Furthermore, studies developed in Italy, Iran and the United Kingdom were selected, as shown in Figure 2.

Most studies are in English (12; 75%) and four (25%) in Portuguese. With regard to the year of publication, there is a highlight for the years 2018 and 2021, as shown in Figure 3.

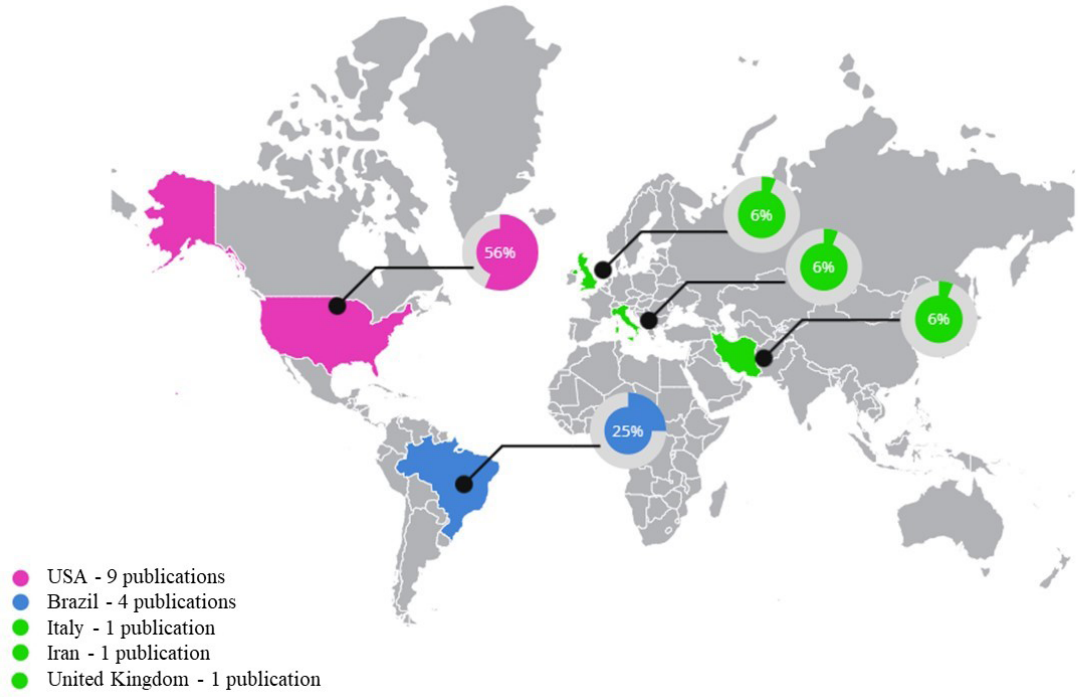


Figure 2 - Countries that developed the documents. Natal, RN, Brazil, 2022.

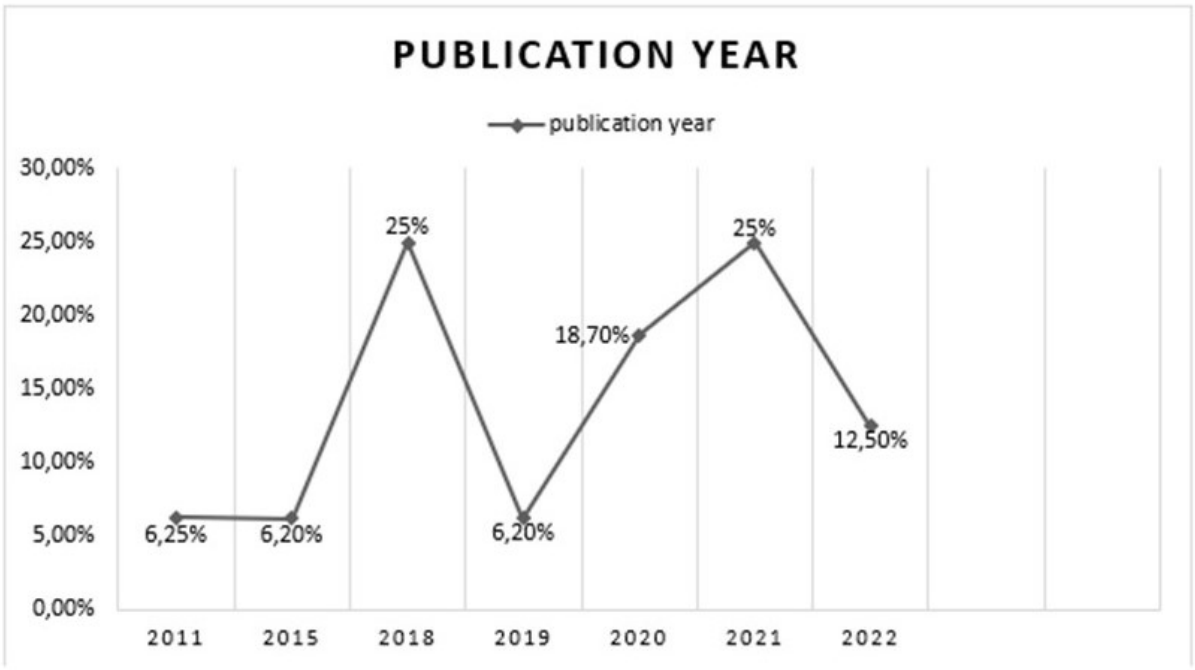


Figure 3 - Year of publication of the documents. Natal, RN, Brazil, 2022**.**

In Chart 2, the studies were organized according to code, reference, year of publication, country of origin, data source, study type and sample, ET type and level of evidence. As for the identified ET, 12 (75%) of studies dealt with dependent, three (18.75%) with independent and one (6.25%) with the joint use of technology dependent, independent and verbal guidance.

Chart 2 - Characterization of publications according to year of publication, country of origin, data source, study design and sample, type of educational technology and level of evidence. Natal, RN, Brazil, 2022. (N=16).

ID*	Author (year)	Country/ data source	Study design/study sample	Type of educational technology	Technology produced and implemented	LoE†
A1	Preussler et al. (2021)[22]	USA/ Scopus	Time series program assessment survey/554 patients and 65 caregivers	Post-Transplant Care Guides	Yes	III.2
A2	Syrjala et. al. (2018)[23]	USA/ Scopus	Randomized clinical trial/1,306 patients	Website and telehealth	Yes	I
A3	Wesley, Fizur (2015)[24]	USA/ Scopus	Scoping review/19 studies	Mobile application	Yes	IV
A4	Taylor et al. (2020)[25]	United Kingdom/ Scopus	Systematic review/23 studies	Mobile application	Yes	I
A5	Tang et al. (2019)[26]	USA/ Scopus	Cohort study/17 caregivers	Video	Yes	III.2
A6	Cioce et al. (2020)[27]	Italy/ PubMed	Randomized clinical trial/36 patients	Video, verbal guidance and personalized information material	Yes	I
A7	Brookshire-Gay et al. (2021)[28]	USA/ PubMed	Cohort study/30 patients	Mobile application	Yes	III.2
A8	Fauer et al. (2018)[29]	USA/ PubMed	Experimental study/42 participants	Mobile application	Yes	III.3
A9	Piubello et al. (2021)[30]	Brazil/ PubMed	Experience report/7 studies	Booklet	Yes	IV
A10	Rozwadowski et al. (2020)[31]	USA/ PubMed	Randomized clinical trial/332 participants	Mobile application	Yes	I
A11	Massumoto et al. (2022)[32]	USA/ CAPES	Experimental study/83 participants	Games	Yes	III.3
A12	Duarte, Mandetta, (2022)[33]	Brazil/ CAPES	Methodological study/13 caregivers	Mobile application	Yes	IV
A13	Abasi et al. (2021)[34]	Iran/ CAPES	Systematic review/16 studies	Mobile application	Yes	I
A14	Syrjala et al. (2011)[35]	USA/ CAPES	Methodological study/1,775 participants	Website	Yes	IV
D1	Batistela, (2018)[36]	Brazil/ LILACS	Exploratory research/6 studies	Educational poster	Yes	IV
D2	Lima (2018)[37]	Brazil/ LILACS	Qualitative research/55 studies	Videos	Yes	IV

*ID= article identification; †LoE= Level of Evidence

DISCUSSION

This section is structured in three parts: the first deals with ET dependent on electronic means/devices and the internet; the second deals with independent ET; and the third deals with the use of dependent ET associated with independent ET and verbal guidance.

Educational technologies dependent on electronic media/devices and the internet

Most studies resulting from the analysis of results showed that the research found investigated the ET classified as dependent[23–26,28–29,31–34,37]. The use of the internet as a modality to inform patients in the post-HSCT period proves to be effective as it is a dynamic and fast means of meeting the needs of post-HSCT survivors[23,35]. In addition to being able to maintain interaction with the team responsible for clinical care[25], the internet, within existing possibilities such as websites, conversation applications and online video platform, meets important requests from patients in terms of choosing the content to be accessed as well as the available audiovisual format and the ability to control the amount and timing of the information they receive[23].

Study involving the use of mobile applications to promote the provision of information to patients have resulted in improved self-care, self-management, communication about the current state of health between professionals and patients, and support for coping with imposed situations[38]. Moreover, mobile applications and websites can also be a space for sharing with other users so that, in addition to monitoring quality of life, it fosters social support among patients[24–25].

Another important way to share the experience of the new and complex routine of the transplanted patient is telehealth. A study carried out in the USA showed that patients with access to this type of technology tend to have benefits in terms of solving problems with access to the medical team[23], such as lower costs for patients, monitoring for greater medication adherence, and better access to health care information[39].

Online videos on sharing platforms are one of the types of ET that have gained prominence in recent years, which have easy and quick access and are inclusive for people with visual and hearing impairments[37]. A randomized clinical trial conducted in the USA also used videos with young adults to encourage self-management and help focus on the elements that he considers most important in his life. Such a strategy can be considered a source of support during HSCT[40]. On the other hand, internet access is still selective, and disfavors poorer social classes and people with little education.

In addition to these, games become important ET for self-management of health, especially for children and adolescents. They have the ability to educate in an interactive way, bring students a naturalness towards the findings and can be used both to complement the guidelines at the time of discharge and informally at home. These technologies enable awareness of the condition as well as early detection and timely intervention in the effects of treatment[32].

A study carried out in the USA developed a mobile game to encourage physical activity among HSC transplant recipients. The need to create a motivational game that engages HSCT patients to be physically active is important for this population, as exercise, in addition to being safe during treatment, can improve physical function and quality of life as well as help reduce risk of falls, blood clots, nausea and fatigue[41].

It is worth noting that the ET employed in the health field are not an end in themselves, i.e., they alone may not be able to provide all the necessary information and content to patients. To this end, it is important that health professionals are motivated and trained to use it, with the necessary

guidelines and, above all, they must recognize the objectives and expected results generated by the technology adopted/chosen[8].

These technologies can and should be added to professionals' verbal guidance in order to cover the widest variety of patient learning styles[29,31] with a view to consolidating what research proves: that knowledge reduces anxiety and depression and, consequently, increases transplant recipients' quality of life[23,35].

Independent educational technologies

The independent ET evidenced by studies selected to compose the sample were educational posters[36], booklets[30], individual plans[22,35] and guides for orientations[21]. The development of these technologies, when considering the scientific literature and evidence-based practice, demonstrates the scientific responsibility of these contents and meets patients' search for complete, coherent and scientifically proven information. In addition to this, it favors those who do not have the internet or who do not have the ability to handle it, in addition to some of them being configured as accessible at any time or place.

The ease of handling independent ET, especially booklets, is due to their accessible understanding, in addition to the clarity, objectivity and presence of images, which provides the reader with an understanding of the subject addressed. Therefore, it is understood that using a booklet to support self-management guidelines is intended to alleviate moments of insecurity and uncertainty for patients[30].

A study carried out in Brazil developed a booklet to educate and guide post-HSCT patients about graft versus host disease (GVHD), dealing specifically with the care that patients must have for the prevention and management of this complication so feared by patients undergoing allogeneic HSCT[42].

On the other hand, it is known that chronic patients with low levels of education have difficulty using this type of ET. Such an obstacle prevents the understanding of health instructions and can lead to a lack of self-confidence in the ability to practice self-management, presenting itself as another factor that impairs compliance with treatment[43].

Another independent ET is the individual care plan or individual therapeutic project, as it is better known in Brazil, defined as a set of proposals and therapeutic behaviors articulated in a unique way[44]. Nurses, professionals who are at the forefront of educational processes in health services, together with the multidisciplinary team, have an important role in identifying patients' needs, level of knowledge and education, thus being able to develop and fully implement a proposal with all the care aimed at maintaining life safely and with quality[45].

In addition, there are guides/guidelines/consensus guidelines. There are several types of documents available in the literature, from those that present HSCT in detail[13] as well as materials focused on specific aspects, such as food/nutrition[46]. There are also those that treat some diseases, such as sickle cell anemia[47], or a type of HSCT[48]. With regard to these materials, the important thing is for health professionals to define the most appropriate one to meet patients' learning needs at the moment.

In addition to the materials mentioned above, a cross-sectional study carried out in Germany emphasizes the need to develop guidelines and recommendations that address the risks and rehabilitation needs of post-HSCT patients. The rehabilitation of patients undergoing this type of transplant differs from the others and requires a lot of technical-scientific knowledge and experience in the management of conducts and interventions by nurses and a multidisciplinary team[49].

Dependent educational technology associated with independent and verbal guidance

Depending on the educational need imposed by patients, there is a need to link two or more types of ET to verbal guidelines in order to achieve satisfactory levels of learning. This could be proven through a randomized clinical trial carried out in Italy with patients who underwent allogeneic HSCT, in which it was possible to recognize that the use of video and informative material for individual learning followed by verbal guidelines notably improved knowledge and practical skills for self-management[27].

A study carried out in the USA highlights the exchange of experiences and verbal guidelines between patients and also with the clinical team. Support groups were mentioned as an important tool for the development of self-management, seen as necessary even before performing the transplant as a means of encouragement. Some of the topics discussed concerned the expected side effects and the changes to be made in daily life to improve quality of life after HSCT[50].

This interaction can be classified as a soft ET, as it deals with a relational technology, according to Merhy's classification, which can be mediated by dependent and/or independent ET. In a study carried out in the USA, patients reported that only the guidelines given verbally or in writing are inconsistent, and transplant service professionals stated that it was difficult to find up-to-date educational material[51].

With regard to the need for relationships with other patients undergoing HSCT, one can understand the importance of alternatives for health education with a focus on self-management, through strategies to promote the autonomy and empowerment of patients, such as the Patient Expert Program, which aims to equip subjects so that they develop skills with professionals, for the proper management and self-management of their health condition[52–53].

This patient becomes a multiplier of information and experiences, and the use of dependent or independent ET, combined with verbal guidance provided by the health team or exchange of experiences between patients, can facilitate the development of relationships on an ongoing basis and encourage collective activities in order to encourage care self-management[1].

Given the above, it can be understood that the use of independent ET linked or not to dependent ET and verbal guidelines are important means for the development of a culture of self-management by post-HSCT patients. It should be noted that, sometimes, nursing professionals still apply technologies in an unthought of way. It is necessary to reflect on some important points before using any type of educational or care tool, such as "what for", "for whom", "what is the purpose", "what is the context", "what materials are used" and "what is the expected result". This reinforces the commitment and technical-scientific, ethical-political and care-educational competence of the profession, and can encourage the strengthening of nursing as a subject and science[53–54].

This study has limitations related to the predominance of studies with a low level of evidence, because the methodologies come from experience reports and qualitative studies. This ScR focused only on the post-HSCT scenario, which may have reduced the number of studies in the final sample. Despite these limitations, this review highlights the methodological rigor required by the JBI and the mapping of evidence on the ET used by nurses to teach self-management in the post-HSCT context.

Contributions to nursing and health are based on the impact that health education has on self-care management for chronic patients. Thus, studies like this one, which explore the use and creation of ET within the scope of HSCT, are incentives for the adoption of actions that encourage the development of safe practices and that favor the quality of nursing care provided.

CONCLUSION

The use of ET by professionals in teaching and educating patients in health is a reality present in services at any level of health care. The highlight of the approach to this topic is anchored in how these technologies are used in patient education and whether they are defined appropriately for each patient, according to the results of this study. It is also important for health professionals to know the types and possibilities of ET that can be used when providing guidance, especially with patients undergoing HSCT.

Among the results presented, the application of dependent and independent ET in isolation is observed as well as the combination of the two possibilities linked to verbal guidelines as a way of effectively meeting patients' educational needs. Among the most researched by the studies are applications, software, websites and videos, which indicates a growing computerization and use of digital resources for teaching health and encouraging self-management. However, it is important to consider users' learning specificities as well as professionals' knowledge about the types and ways of using ET.

Finally, it should be noted that the well-planned implementation of ET guides the learning that must be aligned with the contents necessary for self-management in the post-HSCT period, in order to provide quality of life and longer survival for patients.

Furthermore, it is worth noting the scarcity of studies that address the construction and validity of ET used in the post-HSCT context, a fact that emerges as a suggestion for further studies to be developed in the area. It is also encouraged that researchers carry out experimental studies in order to demonstrate the effectiveness of the technologies developed in the research and their impact on HSCT survivors' quality of life.

REFERENCES

1. Teixeira E, Medeiros HP, Nascimento MHM. Referenciais metodológicos para validação de tecnologias cuidativo-educacionais. In: Nietsche EA, Teixeira E, Medeiros HP, orgs. Tecnologias cuidativo-educacionais: uma possibilidade para o empoderamento do(a) enfermeiro(a). Porto Alegre: Moriá; 2014. p. 113-27.
2. Franco TB, Merhy EE. Cartografias do trabalho e cuidado em saúde. Rev Tempus Actas Saúde Coletiva [Internet]. 2012 [cited 2022 Oct 05];6(2):151-63. Available from: https://www.tempusactas.unb.br/index.php/tempus/article/view/1120/1034
3. Coelho MO, Jorge MSB. Tecnologia das relações como dispositivo do atendimento humanizado na atenção básica à saúde na perspectiva do acesso, do acolhimento e do vínculo. Ciênc Saúde Coletiva [Internet]. 2009 [cited 2022 Oct 05];14:1523-31. Available from: https://doi.org/10.1590/S1413-81232009000800026
4. Nietsche EA, Backes VMS, Colomé CLM, Ceratti RN, Ferraz F. Tecnologias educacionais, assistenciais e gerenciais: uma reflexão a partir da concepção dos docentes de enfermagem. Rev Latino-Am Enfermagem [Internet]. 2005 [cited 2022 Oct 05];13(3):344-53. Available from: https://www.scielo.br/j/rlae/a/D73Y67WhnhmbtqqX58czmzL/?lang=pt
5. Nietsche EA, Lima MGR, Rodrigues MGS, Teixeira JA, Oliveira BNB, Motta CA, et al. Tecnologias inovadoras do cuidado em enfermagem. Rev Enferm UFSM [Internet]. 2012 [cited 2022 Feb 20];2(1):182-189. Available from: https://periodicos.ufsm.br/reufsm/article/view/3591/3144

6. Salbego C, Nietsche EA, Ramos TK, Giardon-Perlini NMO, Lacerda MR, Ferreira T. Concepções sobre tecnologias do cuidar e educar na práxis do enfermeiro hospitalar. Rev Fun Care Online [Internet]. 2021 [cited 2022 Feb 20];13:150-7. Available from: http://doi.org/10.9789/2175-5361.rpcfo.v13.8669

7. Cecilio SG, Gomes ATL, Goulart CF, Vieira LG, Gazzinelli MF. Teaching strategies used in the training of the nurse-educator: an integrative review. Rev Rene [Internet]. 2021 [cited 2022 Feb 20];22:e61210. Available from: https://doi.org/10.15253/2175-6783.20212261210

8. Azevedo IC, Ferreira Júnior MA, Flores VGT, Gonçalves EAP, Frota OP, Cardoso MP, et al. Psychological suffering of patients transplanted with hematopoietic stem cells. Biosci J [Internet]. 2019 [cited 2022 Mar 01];35(5):1633-9. Available from: http://doi.org/10.14393/BJ-v35n5a2019-36226

9. Reis DLA, Santos SMA, Kietzer KS. Tecnologia educacional em saúde para pacientes em tratamento quimioterápico ambulatorial. Interdiscip J Health Educ [Internet]. 2017 [cited 2022 Mar 01];2(2):103-9. Available from: https://doi.org/10.4322/ijhe.2017.005

10. Marques ACB, Proença SFFS, Machado CAM, Guimarães PRB, Maftum MA, Kalinke LP. Qualidade de vida nos primeiros seis meses pós-transplante de células-tronco hematopoéticas. Texto Contexto Enferm [Internet]. 2017 [cited 2022 Feb 20];26(3):e5040016. Available from: https://doi.org/10.1590/0104-07072017005040016

11. Azevedo IC, Ferreira Júnior MA, Nascimento AAA, Vitor AF, Teston EF, Frota OP, et al. Analysis of factors associated with hematopoietic stem-cell retransplantation: a case-control study. Rev. Latino-Am. Enfermagem [Internet]. 2022 [cited 2022 Oct 05];30:e3535. Available from: https://doi.org/10.1590/1518-8345.5794.3535

12. Associação Brasileira de Transplantes de Órgãos. Dimensionamento dos transplantes no Brasil e em cada estado: (2014-2021) [Internet]. 2019 [cited 2022 Oct 05]. Available from: https://site.abto.org.br/publicacao/xxvii-no-4/

13. Bazinet A, Popradi G. A general practitioner's guide to hematopoietic stem-cell transplantation. Curr Oncol [Internet]. 2019 [cited 2022 Oct 05];26(3):187-91. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6588058/

14. Silva KPS, Silva AC, Santos AMS, Cordeiro CF, Soares DMA, Santos FF, et al. Autocuidado a luz da teoria de Dorothea Orem: panorama da produção científica brasileira. BJDV [Internet]. 2021 [cited 2022 Oct 05];7(4):34043-60. Available from: https://brazilianjournals.com/ojs/index.php/BRJD/article/view/27562

15. Lima GKS, Santos AAP, Silva JMO, Comassetto I, Correia SR, Ferreira DCS. Self-care of adolescents in the puerperal period: application of the Orem Theory. Rev Enferm UFPE on line [Internet]. 2017 [cited 2022 Oct 05];11(10):4217-25. Available from: https://periodicos.ufpe.br/revistas/revistaenfermagem/article/viewFile/231185/25166

16. Galvão MTRLS, Janeiro JMSV. O autocuidado em enfermagem: autogestão, automonitorização e gestão sintomática como conceitos relacionados. Rev Min Enferm [Internet]. 2013 [cited 2022 Oct 17];17(1):225-30. Available from: https://pesquisa.bvsalud.org/portal/resource/pt/lil-684241

17. Rodrigues JAP, Lacerda MR, Galvão MC, Gomes IM, Meier MJ, Caceres NTG. Nursing care for patients in post-transplantation of hematopoietic stem cells: an integrative review. Rev Bras Enferm [Internet]. 2021 [cited 2022 Oct 05];74(3):e20200097. Available from: https://doi.org/10.1590/0034-7167-2020-0097

18. Peters MDJ, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil H. Chapter 11: Scoping reviews (2020 version). In: Aromataris E, Munn Z, editors. JBI Manual for evidence synthesis [Internet]. 2020 [cited 2022 Feb 20]. Available from: https://doi.org/10.46658/jbimes-20-12

19. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8(1):19-32.

20. Aromataris E, Munn Z, editors. JBI Reviewer's Manual [Internet]. JBI; 2020 [cited 2022 Apr 28]. Available from: https://synthesismanual.jbi.global

21. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med [Internet]. 2018 [cited 2022 Feb 20];169(7):467-73. Available from: https://doi.org/10.7326/M18-0850

22. Preussler JM, Payton TJ, Moore HK, Denzen EM, McCann M, Mau LW. Application and evaluation of survivorship care guides for hematopoietic cell transplantation recipients. Transplant Cell Ther [Internet]. 2021 [cited 2022 Mar 04];27:266.e1-266.e7. Available from: https://doi.org/10.1016/j.jtct.2020.12.007

23. Syrjala KL, Crouch ML, Leisenring WM, Flowers MED, Artherholt SB, Fiscalini AS, et al. Engagement with INSPIRE, an online program for hematopoietic cell transplantation survivors. Biol Blood Marrow Transplant [Internet]. 2018 [cited 2022 Mar 04];24(8):1692-8. Available from: https://doi.org/10.1016/j.bbmt.2018.05.004

24. Wesley KM, Fizur PJ. A review of mobile applications to help adolescent and young adult cancer patients. Adolesc Health Med Ther [Internet]. 2015 [cited 2022 Jun 11];6:141-8. Available from: https://doi.org/10.2147/AHMT.S69209

25. Taylor S, Bellhouse S, Allsop M, Radford J, Yorke J. The role of e-health in the delivery of care for patients with hematological cancers: a systematic literature review. Telemed J E Health [Internet]. 2020 [cited 2022 Mar 04];26(9):1093-105. Available from: https://doi.org/10.1089/tmj.2019.0231

26. Tang S, Landery D, Covington G, Ward J. The use of a video for discharge education for parents after pediatric stem cell transplantation. J Pediatr Oncol Nurs [Internet]. 2019 [cited 2022 Mar 04];36(2):93-102. Available from: https://doi.org/10.1177/1043454218818059

27. Cioce M, Lohmeyer FM, Moroni R, Magini M, Giraldi A, Garau P, et al. Impact of Educational interventions on psychological distress during allogeneic hematopoietic stem cell transplantation: a randomised study. Mediterr J Hematol Infect Dis [Internet]. 2020 [cited 2022 Mar 04];12(1):e2020067. Available from: https://doi.org/10.4084/MJHID.2020.067

28. Brookshire-Gay K, LaLonde L, Byrd M, Neenan A, Seyedsalehi S, Hanauer DA, et al. Health information technology utilization by adolescent and young adult aged inpatients undergoing hematopoietic cell transplantation. J Adolesc Young Adult Oncol [Internet]. 2021 [cited 2022 Jun 04];100-4. Available from: http://doi.org/10.1089/jayao.2020.0079

29. Fauer AJ, Hoodin F, Lalonde L, Errickson J, Runaas L, Churay T, et al. Impact of a health information technology tool addressing information needs of caregivers of adult and pediatric hematopoietic stem cell transplantation patients. Support Care Cancer [Internet]. 2019 [cited 2022 Jun 04];27(6):2103-12. Available from: https://doi.org/10.1007/s00520-018-4450-4

30. Piubello SMN, Reichembach MT, Pontes L, Boller S. COVID-19 pandemic: educational technology for posthematopoietic stem cell transplant patients. Rev Bras Enferm [Internet]. 2021 [cited 2022 Mar 04];74(1):e20201088. Available from: https://doi.org/10.1590/0034-7167-2020-1088

31. Rozwadowski M, Dittakavi M, Mazzoli A, Hassett FL, Braun T, Barton DL, et al. Promoting health and well-being through mobile health technology (roadmap 2.0) in family caregivers and patients undergoing hematopoietic stem cell transplantation: protocol for the development of a mobile randomized controlled trial. JMIR Res Protoc [Internet]. 2020 [cited 2022 Jun 04];9(9):e19288. Available from: https://doi.org/10.2196/19288

32. Masumoto D, Nakagami-Yamaguchi E, Nambu M, Maeda M, Uryu H, Hayakawa A. A pilot study of game-based learning programs for childhood cancer survivors. BMC Cancer [Internet]. 2022 [cited 2022 Jun 04];22(1):340. Available from: https://doi.org/10.1186/s12885-022-09359-w

33. Duarte AM, Mandetta MA. TMO-App: construção e validação de aplicativo para famílias de crianças/adolescentes com câncer. Acta Paul Enferm [Internet]. 2022 [cited 2022 Jun 04];35:eAPE03502. Available from: https://doi.org/10.37689/acta-ape/2022AO03502

34. Abasi S, Yazdani A, Kiani S, Mahmoudzadeh-Sagheb Z. Effectiveness of mobile health-based self-management application for posttransplant cares: a systematic review. Health Sci Rep [Internet]. 2021 [cited 2022 Jun 04];4(4):e434. Available from: https://doi.org/10.1002/hsr2.434

35. Syrjala KL, Stover AC, Yi JC, Artherholt SB, Romano EM, Schoch G, et al. Development and implementation of an Internet-based survivorship care program for cancer survivors treated with hematopoietic stem cell transplantation. J Cancer Surviv [Internet]. 2011 [cited 2022 Mar 04];5(3):292-304. Available from: https://doi.org/10.1007/s11764-011-0182-x

36. Batistela AP. Alta responsável de crianças submetidas ao transplante de células tronco hematopéticas: tecnologia educacional baseada em evidências [dissertação]. Curitiba: Universidade Federal do Paraná, Programa de Pós-Graduação em Enfermagem; 2018 [cited 2022 Jun 21]. Available from: https://acervodigital.ufpr.br/bitstream/handle/1884/59245/R%20-%20D%20-%20ANA%20PAULA%20BATISTELA.pdf?sequence=1&isAllowed=y

37. Lima AP. Alta responsável: tecnologia educacional para pacientes e cuidadores [dissertação]. Curitiba: Universidade Federal do Paraná; 2018 [cited 2022 Jun 21]. Available from: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-1121427

38. Mehdizadeh H, Asadi F, Mehrvar A, Nazemi E, Emami H. Smartphone apps to help children and adolescents with cancer and their families: a scoping review. Acta Oncol [Internet]. 2019 [cited 2022 Oct 04];58(7):1003-14. Available from: https://doi.org/10.1080/0284186X.2019.1588474

39. Cordeiro A, Fatobene G, Mariano L, Rocha V. Telehealth in hematopoietic cell transplantation: perspective from patients at a public hospital in Brazil. Bone Marrow Transplant [Internet]. 2022 [cited 2022 Oct 04];57:1735-6. Available from: https://doi.org/10.1038/s41409-022-01782-8

40. Vinette B, Mrad H, El-Akhras A, Bilodeau K. Synthesis of self-management strategies used by young adults who have undergone hematopoietic stem cell transplantation: a narrative review. Can Oncol Nurs J [Internet]. 2021 [cited 2022 Oct 04];31(4):470-5. Available from: https://doi.org/10.5737/23688076314470475

41. Cerbas S, Kelemen A, Liang Y, Sik-Lanyi C, Van de Castle BA. Physical activity mobile game for hematopoietic stem cell transplant patients: app design, development, and evaluation. JMIRx Med [Internet]. 2021 [cited 2022 Oct 04];2(2):e20461. Available from: https://xmed.jmir.org/2021/2/e20461

42. Soares RH, Rodrigues JAP, Piubello SMN, Niero AC, Cordeiro IRR, Stelmatchuck AM. Validação de cartilha educativa para orientações no manejo da doença do enxerto contra o hospedeiro. Res Soc Dev [Internet]. 2022 [cited 2022 Oct 04];11(4):e5511426995. Available from: http://doi.org/10.33448/rsd-v11i4.26995

43. Chehuen JA, Costa LA, Estevanin GM, Bignoto TC, Vieira CIR, Pinto FAR, et al. Functional Health Literacy in chronic cardiovascular patients. Ciênc Saúde Coletiva [Internet]. 2019 [cited 2022 Mar 10];24(3):1121-32. Available from: https://doi.org/10.1590/1413-81232018243.02212017

44. Carvalho Neto F, Ramos MS, Guimarães M, Ibiapina AS, Costa AC, Silva R L, et al. Projeto Terapêutico Singular: ferramenta de superação do GAP terapêutico em saúde mental. Enfermagem em Foco [Internet]. 2021 [cited 2022 Oct 04];11(4):95-9. Available from: https://doi.org/10.21675/2357-707X.2020.v11.n4.3372

45. Benicá TOS, Nascimento SCT, Pereira GC, Ramos LGA. O papel do enfermeiro no transplante de células tronco hematopoiéticas. Res Soc Dev [Internet]. 2021 [cited 2022 Oct 04];10(9):e48810918171. Available from: http://doi.org/10.33448/rsd-v10i9.18171

46. Barban JB, Simões BP, Moraes BD, Anunciação CR, Rocha CS, Pintor DC, et al. Consenso brasileiro de nutrição em transplante de células-tronco hematopoiéticas: adultos. Einstein [Internet]. 2020 [cited 2022 Oct 04];18:eAE4530. Available from: http://doi.org/10.31744/einstein_journal/2020AE4530

47. Kanter J, Liem RI, Bernaudin F, Bolaños-Meade J, Fitzhugh CD, Hankins JS, et al. American Society of Hematology 2021 guidelines for sickle cell disease: stem cell transplantation. Blood Adv [Internet]. 2021 [cited 2022 Oct 04];5(18):3668-89. Available from: https://doi.org/10.1182/bloodadvances.2021004394c

48. Massachusetts General Hospital Cancer Center. Your Guide to the Allogeneic Hematopoietic Stem Cell Transplant [Internet]. 2018. Available from: https://www.massgeneral.org/assets/mgh/pdf/cancer-center/bmt/guide-allogeneic-hematopoietic-stem-cell-transplant.pdf

49. Bertz H. Rehabilitation after allogeneic haematopoietic stem cell transplantation: a special challenge. Cancers [Internet]. 2021 [cited 2022 Oct 04];13(24):6187. Available from: https://doi.org/10.3390/cancers13246187

50. Jim H, Quinn G, Gwede C, Gwede CK, Cases MG, Barata A, et al. Patient education in allogeneic hematopoietic cell transplant: what patients wish they had known about quality of life. Bone Marrow Transplant [Internet]. 2014 [cited 2022 Oct 04];49:299-303. Available from: https://www.nature.com/articles/bmt2013158

51. Armato K, Weisbrod B. BMT Patient education: consistency and understandability in a complex population; creating a standardized patient education process for blood and marrow transplant, a single institution experience in an academic medical center. Biol Blood Marrow Transplantat [Internet]. 2019 [cited 2022 Oct 04];25(3):S83. Available from: https://doi.org/10.1016/j.bbmt.2018.12.189

52. Achury-Saldaña DM, Restrepo L, Munar MK, Rodríguez I, Cely MC, Abril N, et al. Efecto de un programa de paciente experto en insuficiencia cardiaca. Enferm Glob [Internet]. 2020 [cited 2022 Mar 10];19(57):479-506. Available from: https://scielo.isciii.es/scielo.php?script=sci_abstract&pid=S1695-61412020000100015

53. Mestre AG, Bujan PA, Sánchez EG, Pérez EMR, González SS, Segura JCC. Resultats del Programa Pacient Expert Catalunya® (PPE-CAT®) en insuficiència cardíaca (IC) i malaltia pulmonar obstructiva crònica (MPOC): 10 anys d'evolució d'una activitat comunitària d'aprenentatge entre iguals. Xpa Health Commun [Internet]. 2018 [cited 2022 Mar 10];1:1-14. Available from: http://www.xpabcn.com/revista/index.php/XPAHC/article/view/7/23

54. Azevedo IC, Nascimento AAA, Azevedo VD, Torres DVO, Rocha MCS, Ribeiro SEA, et al. Tecnologias em saúde: subsídio para o cuidado de enfermagem no transplante de células-tronco hematopoéticas. Res Soc Dev [Internet]. 2022 [cited 2022 Mar 14];11(3):e29811326947. Available from: http://doi.org/10.33448/rsd-v11i3.26947

NOTES

ORIGIN OF THE ARTICLE

Article extracted from the dissertation "*Construção e validação de tecnologia educacional para formação de enfermeiros do transplante de células-tronco hematopoéticas sobre o Programa Paciente Experto*", presented to the Department of Nursing of the *Universidade Federal do Rio Grande do Norte*, 2022.

CONTRIBUTION OF AUTHORITY

Study design: Nascimento AAA, Azevedo IC.
Data collection: Nascimento AAA, Azevedo VD, Silva AF, Godinho ML.
Data analysis and interpretation: Nascimento AAA, Azevedo VD, Silva AF, Godinho ML, Azevedo IC.
Discussion of results: Nascimento AAA, Azevedo VD, Silva AF, Godinho ML, Azevedo IC.
Writing and/or critical review of content: Nascimento AAA, Azevedo VD, Silva AF, Godinho ML, Martins QCS, Santos VEP, Ferreira Junior MA, Azevedo IC.
Review and final approval of the final version: Nascimento AAA, Azevedo VD, Silva AF, Godinho ML, Martins QCS, Santos VEP, Ferreira Junior MA, Azevedo IC.

FUNDING INFORMATION

To the Brazilian National Council for Scientific and Technological Development (CNPq - *Conselho Nacional de Desenvolvimento Científico e Tecnológico*), for the scholarship, Notice 47/2017 CAPES/PRINT.

CONFLICT OF INTEREST

There is no conflict of interest.

HISTORICAL

Received: July 05, 2022.
Approved: December 05, 2022.

CORRESPONDING AUTHOR

Isabelle Campos de Azevedo
isabellebr2511@gmail.com