

Quality of Life of Oncohematologic Cancer Survivors Undergoing Hematopoietic Stem Cell Transplantation: Integrative Review Literature

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Qualidade de Vida de Sobreviventes de Câncer Onco-Hematológico Submetidos ao Transplante de Células-Tronco Hematopoiéticas: Revisão Integrativa da Literatura

Calidad de Vida de Sobrevivientes de Câncer Oncohematológico Sometidos a Trasplante de Células Madre Hematopoyéticas: Revisión Integradora de la Literatura

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ABSTRACT

Introduction: Advances of onco-hematological cancer-related treatment have resulted in an increasing number of patients undergoing Hematopoietic Stem Cell Transplantation (HSCT) with therapeutic success, which requires more attention to the quality-of-life (QoL) of survivors. **Objective:** To identify the QoL of onco-hematologic survivors undergoing HSCT. **Method:** Integrative review, from 2011 to 2021 with search in the databases LILACS, MEDLINE, IBECs, SciELO and the Cochrane Library. The SPIDER strategy was used to answer the guiding questions, and the level of evidence was classified according to the Joanna Briggs Institute. **Results:** Twenty-six articles were included. The most used instruments to measure QoL were Quality of Life Questionnaire – Core 30 and Functional Assessment Cancer Therapy-Bone Marrow Transplantation. Biopsychosocial, educational and clinical variables, such as comorbidities, history, epidemiological conditions and type of conditioning did not significantly influence the QoL of onco-hematological survivors undergoing HSCT. Quality-of-life was impaired by chronic physical problems, readmissions, financial burdens, graft-versus-host disease, fatigue, psychological symptoms, recurrent infections, dysfunctions in sexual and fertile functioning, secondary neoplasms and physical symptoms such as pain and sleep disorders. **Conclusion:** The HSCT survivor has continuous demands for biopsychosocial care which negatively impact the QoL and require multidimensional attention.

Key words: quality of life; hematopoietic stem cell transplantation; hematology; cancer survivors; neoplasms.

RESUMO

Introdução: Os avanços no tratamento relacionado ao câncer onco-hematológico têm resultado em um crescente número de pacientes submetidos ao transplante de células tronco-hematopoiéticas (TCTH) com êxito terapêutico, o que exige maior atenção com a qualidade de vida (QV) dos sobreviventes. **Objetivo:** Identificar a QV dos sobreviventes onco-hematológicos submetidos ao TCTH. **Método:** Revisão integrativa, entre 2011 a 2021, com busca nas bases de dados LILACS, MEDLINE, IBECs, SciELO e Biblioteca Cochrane. Utilizou-se a estratégia SPIDER para responder às questões norteadoras, e o nível de evidência foi classificado segundo o Instituto Joanna Briggs. **Resultados:** Vinte e seis artigos foram incluídos. Os instrumentos mais utilizados para medir a QV foram o *Quality of Life Questionnaire – Core 30* e o *Functional Assessment Cancer Therapy-Bone Marrow Transplantation*. Variáveis biopsicossociais, educacionais e clínicas, como comorbidades, antecedentes, condições epidemiológicas e tipo de condicionamento não influenciaram significativamente a QV dos sobreviventes onco-hematológicos submetidos ao TCTH. A QV apresentou comprometimento na vigência de problemas físicos crônicos, reinternações, encargos financeiros, doença do enxerto contra o hospedeiro, fadiga, sintomas psicológicos, infecções recorrentes, disfunções no funcionamento sexual e fértil, neoplasias secundárias e sintomas físicos como dor e distúrbios do sono. **Conclusão:** O sobrevivente do TCTH mantém demandas de cuidados biopsicossociais que influenciam negativamente a QV, evidenciando a necessidade de cuidado multidimensional.

Palavras-chave: qualidade de vida; transplante de células-tronco hematopoiéticas; hematologia; sobreviventes de câncer; neoplasias.

RESUMEN

Introducción: Los avances en el tratamiento relacionado con el cáncer oncohematológico han dado como resultado un número creciente de pacientes sometidos a trasplante de células progenitoras hematopoyéticas (TPH) con éxito terapéutico, lo que requiere una mayor atención a la calidad de vida (CV) de los sobrevivientes. **Objetivo:** Identificar la CV de sobrevivientes oncohematológicos sometidos a TPH. **Método:** Revisión integradora, entre 2011 y 2021 con búsqueda en las bases de datos LILACS, MEDLINE, IBECs, SciELO y Cochrane Library. Se utilizó la estrategia SPIDER para responder las preguntas orientadoras; y el nivel de evidencia se clasificó según el Instituto Joanna Briggs. **Resultados:** Se incluyeron veintiséis artículos. Los instrumentos más utilizados para medir la CV fueron *Quality of Life Questionnaire – Core 30* y *Functional Assessment Cancer Therapy-Bone Marrow Transplantation*. Variables biopsicosociales, educativas y clínicas, como comorbidades, antecedentes, condiciones epidemiológicas y tipo de condicionamiento no influyeron significativamente en la CV de los sobrevivientes oncohematológicos sometidos a TPH. La calidad de vida se vio afectada en presencia de: problemas físicos crónicos, reingresos, cargas financieras, enfermedad de injerto contra huésped, fatiga, síntomas psicológicos, infecciones recurrentes, disfunciones en el funcionamiento sexual y fértil, neoplasias secundarias y síntomas físicos como dolor y trastornos del sueño. **Conclusión:** El sobreviviente del TPH mantiene demandas de atención biopsicosocial que influyen negativamente en la CV, evidenciando la necesidad de atención multidimensional.

Palabras clave: calidad de vida; trasplante de células madre hematopoyéticas; hematología; supervivientes de cáncer; neoplasias.

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INTRODUCTION

Quality-of-life (QoL) is a dynamic concept related to the physical, cognitive, emotional, social functioning and well-being. The main concerns of cancer survivors involve QoL related issues¹.

Currently, oncologic treatments have improved the ability of fighting neoplastic cells and avoiding and/or managing side effects. Hematopoietic stem-cells transplantation is a modality of treatment consisting in the utilization of high doses of antineoplastic chemotherapy or radiotherapy and infusion of extracted fully hematopoietic stem-cells from the bone marrow or cells selected from the patient or related or unrelated compatible donor. The complexity of the complications potentially occurring during and after the therapy are HSCT-dependent, the transplantation can be allogeneic, autologous, related or unrelated myeloablative or non-myeoablative².

HSCT is a treatment-related life-threatening complex therapeutic intervention with high mortality. If successful, nearly 90% of the allogeneic HSCT survivors may present at least one treatment-related adverse side effect. Multiple late effects, specifically the chronic graft-versus-host-disease (GVHD) has great impact on the QoL of HSCT survivors³.

Despite the high complexity, this therapeutic is being improved and increasingly suggested to the patient as promoter of the cure of oncohematologic illness or at least, its long-term control. Approximately 50,000 individuals are submitted to HSCT annually in the whole world⁴. In Brazil, in the first trimester of 2019, 480 autologous and 262 allogeneic transplants were performed according to “*Associação Brasileira de Transplante de Órgãos (ABTO)*”²². The progress of this intervention resulted in an increased number of HSCT transplantation survivors and entails more attention to QoL and long-term survival care⁵.

Cancer survivorship is a process that begins at the moment of diagnosis and continues through life with additional health challenges as increased risk of relapse or a new cancer, comorbidities, psychological and economic problems in addition to treatment-related toxicities that involve physical changes⁵.

It is relevant to know the patients’ needs for the development of support programs with better results on QoL because this process can expand through the whole life and requires the support by the health team³, among other demands.

Individuals submitted to HSCT can develop late complications associated with pre, peri and post-transplantation resulting in morbidity, which negatively affect the well-being and contributes to late mortality. Therefore, the objective of this investigation is to evaluate

critically the current scientific production about QoL of HSCT survivors to support caring practices and guide new research questions for future studies and identify the QoL of this population.

METHOD

Integrative review of the literature. The study questions were converted to the acronym SPIDER to facilitate the search as shown in Chart 1.

Chart 1. SPIDER tool to define the key elements of the research question

S	Sample	HSCT survivors
PI	Phenomenon of interest	Main results about the domains of compromised QoL and variables with major interference
D	Design	Studies which evaluated the QoL of hematologic cancer survivors submitted to HSCT published between 2011 and 2021 in national and international journals in Portuguese, English and Spanish
E	Evaluation	Results characterizing the phenomenon investigated: QoL domains were altered, biopsychosocial, educational and clinical variables
R	Research type	Quantitative or mixed methods

Based in the structure of the questions and analysis of the studies, Chart 2 was elaborated. The descriptors were selected from the definition and analysis of the appropriateness of the theme based in single and combined Health Science Descriptors (DeCS): quality of life, hematopoietic stem cell transplantation, hematology, cancer survivors, medical oncology at the databases and/or electronic libraries LILACS, MEDLINE (PubMed), IBECs, SciELO and Cochrane.

The inclusion criteria were articles published by national and international journals in Portuguese, English and Spanish between 2011 and 2021 on the theme QoL of hematologic cancer survivors for undetermined post-treatment period submitted to allogeneic and autologous HSCT transplantation older than 18 years of age.

The type of investigation was not determined, but it was attempted to classify the level of evidence according

to Joanna Briggs Institute⁷. Firstly, the descriptors were applied to find the abstracts and two independent investigators analyzed the appropriateness to the study theme.

RESULTS

Initially, 86 articles which met the theme were identified after applying the eligibility criteria. 26 published in the last ten years were eligible, of these, 94% in English. Figure 1 shows the process of selection of the articles, literature review and case study.

The articles selected were analyzed and the characteristics are summarized in Chart 2. Studies with levels of evidence 3 and 4 predominated, only one intervention study was classified as level of evidence 2. The majority was published as of 2015 (81.4%). The set of variables investigated allowed a wide possibility of analysis about the factors affecting the QoL of patients post-HSCT.

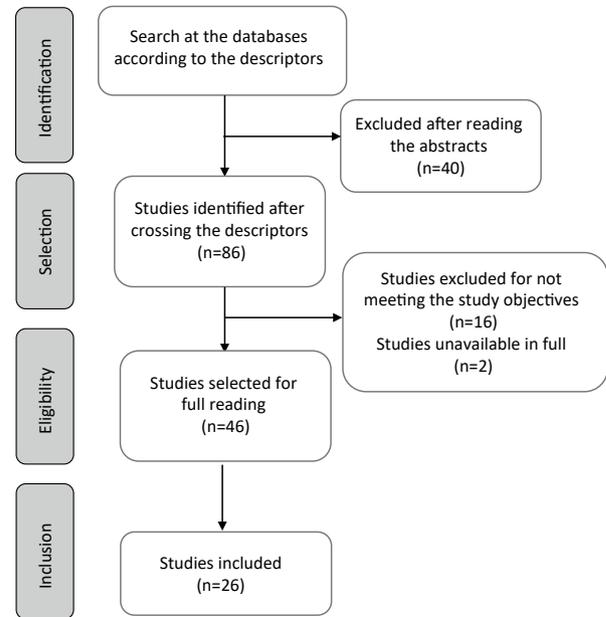


Figure 1. Flowchart of articles selection

Chart 2. Articles selected after search at the databases

Author/year	Objectives	Method/level of evidence (LE)	Main findings
Mo et al., 2012 ⁸	To investigate HRQoL of patients receiving allogeneic hematopoietic SCT (allo-HSCT) from HLA-haploidentical/partially matched related donors and to compare this value with that of patients receiving allo-HSCT from HLA-identical sibling donor	Longitudinal observational study LE: 3	GVHD negatively affected all the subscales of QoL, physical, mental and social with high impact in pain and sexual issues. Age at transplantation, HLA disparity and marital status. Skin, lung, liver, gastrointestinal tract and ocular problems negatively affected the QoL. Lower age at allogeneic, males and return to work/school were associated with positive impact at least in one subscale
Hamilton et al., 2013 ⁹	Investigate economic survivorship stressors and their association with HRQoL	Cross-sectional LE:4	Financial and employment stress: poorer physical, functioning and specific performance; economic disparities: health worthening; residual costs uninsured; greater stress and worsening of QoL
Janicsák et al., 2013 ¹⁰	Examine the influence of somatic status, social characteristics, and psychological symptoms on QoL	Cross-sectional LE:4	Pre-transplantation psychiatric comorbidity as potential risk factor for post-transplantation worst QoL; female gender: issues in dealing with specific transplantation-related difficulties. QoL influenced by depression, anxiety, psychiatric comorbidity, employment and sex status. First 3 years: physical and emotional status. Late: social and role functioning
Gifford et al., 2014 ¹¹	Identify health issues in long-term survivors of allo-HSCT	Retrospective LE: 4	Post-transplantation chronic diseases impacted QoL: renal, cardiovascular, ophthalmic, bones, respiratory and/or malignancies. Psychological suffering, depression, most of the patients succeeded in resuming vocation
Bevans et al., 2014 ¹²	Examine the health status and HRQoL of HSCT survivors. Characterize subgroups experiencing adverse outcomes.	Prospective longitudinal study LE:3	Low levels of physical health were found in older and non-Hispanic patients. Post-transplantation comorbidities; immunosuppression late/side effects; GVHD. 3 years or more post HSCT: physical, mental health and QoL return to normative values and remain stable; anguish, HSCT late effect, physical stress
González-Ramírez et al., 2015 ¹	Analyze the QoL of leukemia patients submitted to HSCT (reduced intensity conditioning)	Retrospective LE:4	Survivors of acute myeloid leukemia have lower QoL than most of the population and patients submitted to HSCT. Organic toxicity; osteoporosis; infections; cataract; secondary cancers and infertility
Kurosawa et al., 2015 ¹³	Compare post chemotherapy alone and allogeneic HSCT; Elucidate post-treatment QoL associated factors	Cross-sectional LE:4	Symptoms of GVHD; immunosuppressive therapy, fatigue, sleep disorders. Inability to resume work

to be continued

Chart 2. continuation

Author/year	Objectives	Method/level of evidence (LE)	Main findings
Kenzik et al., 2015 ¹⁴	To evaluate depressive symptoms on the relationship between physical symptoms and HRQoL in HSCT survivors	Cross-sectional LE:4	Optimism increased QoL with significant improvement of physical symptoms, QoL associated physical symptoms; depressive symptoms and psychosocial factors affect mental QoL more
Rosenberg et al., 2015 ¹⁵	Explore correlations between resilience and psychological suffering, posttraumatic growth and QoL	Cross-sectional LE:4	Low resilience leads to low QoL and is associated with GVHD; the lower the resilience scores, more likelihood of psychic suffering and low QoL
Rocha et al., 2016 ¹⁶	Evaluate the impairment of social and emotional domains of inpatients submitted to HSCT	Observational, longitudinal study LE:3	Family support, financial difficulty, vulnerability. Social and family well-being impacted
Proença et al., 2016 ¹⁷	Assess the QoL of adult patients with hematologic cancer in 100 days post-HSCT and verify whether the variable GVHD is predictive of worst results	Quantitative, observational, correlational study LE:3	Advanced age: QoL and survivorship equal to young adults. Chemotherapy toxicity: nausea, vomits, inappetence, pain, skin, body image changes and damaged sexual functioning; chronic GVHD: depression and anxiety. Depression; anxiety, emotional unbalance, fear, feeling of uncertainty of the future, cancer diagnosis
Gifford et al., 2016 ¹⁸	Document late complications associated with health and functioning status, limitations of the current literature and gaps of care	Cross-sectional LE:4	GVHD; sexual dysfunction. Psychosocial impact: loss of job and reduced income; psychosocial and social dysfunction, occupational vulnerability
Clavert et al., 2017 ¹⁹	Late complications and long-term QoL in survivors of allogeneic transplantation with reduced-intensity conditioning	Single center retrospective study LE: 4	Advanced age, type of conditioning, secondary malignancies, GVHD: fatigue, pain, diarrhea. Infections, cardiovascular, lung complications and renal failure. Depression
Marques et al., 2017 ²⁰	Evaluate the QoL of adult patients with hematologic cancer in the first six-months post HSCT and compare the transplant modalities	Observational longitudinal study LE: 3	Education favors selfcare and understanding. GVHD complications; high fatigue, pain, family support, regular practice of physical activity, improvement of social living post hospitalization, worst QoL: diagnosis and frequent rehospitalizations
King et al., 2017 ²¹	Describe religious and spiritual conflicts in survivors and associate with depression and QoL	Cross-sectional LE:4	Young adults, non-White races, religious self-identification, allogeneic transplantation: high level of depression. Religious and spiritual conflicts: depression, worst QoL; social support. Pain
Brice et al., 2017 ³	Understand the long-term impact of HSCT on QoL	Cross-sectional LE:4	Toxicity and immunosuppression, GVHD; complications of transplant on sexual functioning and fertility; cognitive changes: memory deficit, reduction of concentration and attention, mental fatigue and poor response. Opportunities/life change post-HSCT; reduction of emotional and social functioning; life enjoyment post-HSCT; mood changes: anger, frustration, anxiety, depression and fear
El-Jawahri et al., 2018 ²²	Evaluate preliminary feasibility and efficacy of a multimodal intervention to treat sexual dysfunction in allo-HSCT survivors	Intervention LE:2	Chronic GVHD and sexual dysfunction. Psychological problems; women: pain in sexual relation, loss of libido, psychological concerns and with intimacy, difficulty of arousal and concerns with body image; mood improvement, depression and anxiety post-intervention to solve health sexual problems
King et al., 2018 ²³	Describe the prevalence of religious and/or spiritual struggle in long-term young adult survivors following hematopoietic cell transplantation (HSCT) as well as existential concerns, social support, and demographic information	Descriptive LE:4	62% treated for leukemia. 50% spiritual and religious and 1/3 spiritual alone. 14% moderate to severe depression. Religious and/or spiritual struggles were associated with worst scores of existential coping and support to QoL
Devins et al., 2018 ²⁴	Examine symptoms, side effects, anguish and physical and social problems of persons with hematologic cancer or aplastic anemia submitted to HSCT	Cohort study LE: 3	50% were unemployed or on impairment leave. Interference of the disease on personal life. Increase of depressive symptoms and decline of self-esteem: improvement after one year from discharge. Anguish and other psychological symptoms

to be continued

Chart 2. continuation

Author/year	Objectives	Method/level of evidence (LE)	Main findings
Shaw et al., 2018 ²⁵	Report the Patient-Reported Outcomes Measurement Information System of the HSCT survivor compared to Short Form 36	Cross-sectional LE: 3	Worse physical scores: allogeneic receptors with advanced age and shorter time since transplant. Younger autologous receptors reported worse mental health. Overall physical functioning lower than general population but mental functioning was similar. Chronic GVHD and comorbidities associated with significantly worse physical and mental functioning. Relapse was associated with worse physical functioning in autologous but not allogeneic patients
Solh et al., 2018 ²⁶	Examine the long-term results of patients survivors at least one year post allogeneic HSCT without evidence of relapse	Retrospective study LE: 3	Allogeneic post-HSCT and young patients have significant impact on mental scores. Self-reported chronic conditions (pulmonary diseases, vascular necrosis, adrenal failure and diabetes or chronic GVHD), worsening of the physical functioning, anxiety and depression
Park et al., 2019 ²⁷	Examine social adjustment to illness and identify factors related to social adjustment in survivors of allogeneic HSCT	Intervention study LE:3	Unemployed single and elevated fatigue: difficulty of vocational adjustment, education level, ageing, women with fatigue: impact on sexual relation, race/ethnicity, age, sex, time since transplant, fatigue: significant in extended family relations; Hispanic: difficulties in family relationships; elevated fatigue: older adults, problems of adjustment in family relationships and social environment. More difficulties of adjustment concerning extended family relationships, work environment and sexual relations; high social misadjustment for extended family relationships
Lemieux et al., 2020 ²⁸	Report the impact of autologous HSCT on QoL of older patients with non-Hodgkin's lymphoma	Cohort study LE: 3	Pain and relapse negatively impact QoL. Physical and emotional well-being were scored high by FACT-BMT; anxiety, depression and traumatic stress disorder affect QoL
Brice et al., 2020 ²⁹	Quantify the prevalence of fear of recurrence of cancer in patients with previous hematological malignancy more than one year after allogeneic HSCT and identify the demographic, medical and psychologic factors associated with cancer recurrence	Observational study LE: 4	Fear of recurrence associated with unemployment, shorter time (years) post-transplant, not attending to health screening, secondary diagnosis of skin cancer, younger age, referral to psychiatrist and taking psychotropic medication. Depression, anxiety, stress were associated with fear of recurrence and consequently QoL
Georges et al., 2020 ³⁰	Evaluate the main medical problems and QoL faced by patients with diagnosis of lymphoma and post HSCT long-term survivors	Cohort study LE: 3	Medical conditions most reported (> 10% of incidence) were predictors of functional changes: history of herpes-zoster, cataract, osteoporosis or osteopenia, skin cancer and spontaneous fracture. Current medication was more frequent in patients with multiple myeloma for prevention/treatment of infection. Hypothyroidism treated was more common in patients with lymphoma. Worse physical functioning for both was associated with advanced age, small interval since transplantation, comorbidities, relapse and treatment for depression and/or pain. Worse mental functioning was associated with young population and treatment for anxiety, depression or pain. Sexual dysfunction, anxiety and depression. Post-traumatic stress
Harrison et al., 2021 ³¹	Overall view of HSCT, describe cognitive changes and risk factors associated reported by the population, explain possible underlying mechanisms of cognitive alterations	Narrative literature review LE: 4	Risk factors for cognitive change: pre-transplantation cognitive change, common therapeutic utilized in many standard regimens, including methotrexate, cytarabine, cyclosporine, total body/cranial irradiation, corticosteroids, immunosuppressors, advanced age, minority status, educational background, number of induction cycles, history of prophylactic cranial irradiation, history of cranial trauma, intrathecal chemotherapy, prior chemotherapy regimens, transplant type, donor relationship, length of hospital stay and days until engraftment. Sustained impact and broad impact on brain health, causing cognitive dysfunction, fatigue, mood and sleep disorders. In affected patients, autonomy, return to work, relationships and QoL can be affected

Captions: QoL= quality-of-life; HRQoL = health related quality-of-life; GVHD = graft versus host disease; HSCT = hematopoietic stem cells transplantation; HLA = human leukocyte antigen; FACT-BMT = Functional Assessment of Cancer Therapy-Bone Marrow Transplantation.

DISCUSSION

One of the sample studies showed that pre-transplant psychiatric comorbidity can be a potential risk factor for worst post-intervention QoL¹⁰. The others did not address comorbidities, history or clinical artifacts (prosthetics, permanent procedures as stomas, catheters, probes) which negatively influenced the QoL of survivors submitted to HSCT, opening the possibility of more detailed studies of this population to allow the correlation of these data.

A study²² has also shown that female patients have difficulties in dealing with effects related to the transplantation and additional sexual health issues, but methodological limitations as the cross-sectional design and small sample were obstacles to explore the causality of the correlations.

Worst physical scores for allogeneic receptors with advanced age were reported as well. The time since the end of the HSCT was also important for the occurrence of more symptoms, indicating that effects can be minimized as time passes. Young patients present worst mental health for both types of transplant. These data suggest the necessity of more support targeted to different age ranges²⁶.

The variable educational level of the patients was analyzed in a single observational longitudinal study with 55 participants followed up pre-transplant, post-100 and 180 days at a Brazilian reference hospital. The results indicated that education favors self-care and understanding which makes this population active participants in pursuing best results in the course of the treatment and rehabilitation²⁰.

A single study of 2017³ argued if the type of conditioning influenced the QoL of survivors and because the sample is small, the data were not that relevant. However, it is expected that patients with reduced dose conditioning enjoy a good QoL pre-transplant due to low toxicity of the regimen and worse in late post-transplantation because of high rates of GVHD³. A prospective, observational study of 2013⁹ concluded that the clinical outcomes and QoL of patients with myeloid neoplasms submitted to reduced intensity conditioning (RIC) are not worse than myeloablative conditioning (MAC) in one year.

While reviewing the adverse events related to clinical and biopsychosocial variables, GVHD and fatigue stand out as more prevalent. Acute or chronic GVHD is an important side effect addressed in the literature. It is a syndrome that affects patients submitted to HSCT who receive immunocompetent lymphocytes³². The influence on QoL of the survivors is expressed as chronic GVHD which can affect a series of organs and even prolonged

immunosuppression, directly impacting the return to activities of daily life posttransplant. In addition, some authors^{3,19} showed that GVHD resulted in depression and anxiety, symptoms directly related to QoL worsening.

Fatigue interfered in physical, emotional, cognitive and social functions⁸. For patients with early treatment of lymphomas, fatigue can be related to cardiotoxicity resulting from the utilization of some cytotoxic drugs as anthracyclines (doxorubicin, daunorubicin, epirubicin and idarubicin) which for multiple reasons can provoke damages to myocardial cells³³.

Additionally, other side effects as recurrent infections, sexual and fertile dysfunctions, secondary neoplasms and physical symptoms as pain, sleep disorders, and cognitive changes have been shown to negatively influence the well-being, in addition to possible association with rehospitalizations, continuous medical consultations and increase of stress, anxiety and fear, postponing activities of daily life^{31,34}.

These late effects are related to worsening of QoL and functional status of the survivors which require three-to-five years recovery⁹.

However, despite the data have shown major complications for allogeneic receptors, it is important to emphasize that autologous receptors are at risk of suffering the same late complications, rare toxicity or post-transplantation immune compromise and similar risk of allogeneic receptors, for instance, exposure to prolonged corticosteroids or to other drugs that can cause post-transplantation extended lymphopenia⁴. Therefore, health professionals should be attentive to complications regardless of the type of procedure⁴.

Depression, anxiety, fear and uncertainties were found in the articles investigated as influencers of the physical, emotional and social domains of major impact on QoL and problems to reach full satisfactory QoL¹⁵. A cross-sectional study¹⁰ with 121 patients carriers of several oncohematologic diseases showed that psychological variables are strong determinants of QoL of HSCT survivors. This demonstrates that psychological follow-up, therapy or other modalities of treatment and follow-up are required psychosocial interventions for this group of patients¹⁴.

Still in this context, financial problems post-transplantation as hospital costs or difficulty to return to work and professional vocation appear in more than one article with impact on QoL. Usually, the survivors stay longer at the hospital because of prolonged treatment and even in public hospitals some exams or medications utilized during hospitalization or outpatient follow-up are covered by the family, causing anxiety or concern and consequently, worsening the QoL⁹. Hospital length of stay

may change according to the type of transplantation and post-procedure complications from 5 to 106 days and mean of 38.5³⁵. A study conducted in 2018²⁵ with 88 patients submitted to autologous and allogeneic HSCT, with half of the patients survivors of acute leukemias, shows that 50% were unemployed or on impairment leave and one-fifth reported low income.

However, the return to activities of the daily life, regular physical activity, social and family living have positive influence on survivor's QoL and their social reinsertion^{15,16,19,21}. In counterpart, chronic physical problems, rehospitalizations, work-related issues, psychosocial problems, religious conflicts, low resilience and financial burden are hurdles to QoL²⁰. The survivor also perceives the opportunity of post-procedure life change, appreciation for life and mood, improvement of depression and anxiety to resolve sexual health issues³.

The difficulties of the studies' designs to structure the variables influencing the QoL of HSCT survivors are the limitations of the present study in addition to the necessity of follow-up and description of the process of survival of this therapeutic modality.

CONCLUSION

Biopsychosocial and clinical variables as comorbidities, history, artifacts and type of conditioning did not significantly influence the QoL of oncohematological survivors of HSCT.

Physical, emotional, and social adverse events involving GVHD, fatigue, depression, anxiety, fear, uncertainties and financial problems impact the QoL of this population; high education level potentializes self-care and active participation is essential in decision-taking during sickening.

Psychological problems, depression and anxiety are the main impacts on the mental health perceived by survivors of oncohematological cancer with clear effects over their QoL. Social dysfunction associated with occupational vulnerability, reduced income, sexual problems and extended family relationships were observed in the socioecological domain. Regarding physical symptoms, financial stress, self-reported chronic conditions as lung diseases, vascular necrosis, adrenal insufficiency or chronic GVHD negatively impact the QoL. Every physical and psychological demand is associated with HSCT.

The current review portrayed a scenario of many demands of HSCT survivors. The care planning must be interdisciplinary and multidimensional. The biological aspect, including disease recurrence and other treatment derived complications are important further to the minimization or resolution of signs and symptoms and

health literacy for improved self-efficacy and self-management.

Psychosocial and spiritual care should not be neglected as well. Survivors have emotional issues and difficulties of marital and family relationships, lab complications and financial losses that negatively impact the QoL.

The results indicate that this patient, in addition to specialized medical care, need continuous attention since the diagnosis through active treatment.

CONTRIBUTIONS

Michele Eugênio da Silva Vigarinho and Maria das Graças Silva Matsubara contributed to the study design, acquisition, analysis and interpretation of the data, wording and critical review. Edvane Birelo Lopes De Domenico contributed substantially to the wording and critical review. All the authors approved the final version to be published.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

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